CHR

Communications in Humanities Research

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies

Boston, USA

November 29 – December 6, 2024

EWA Publishing

Volume 40

Editor
Heidi Gregory-Mina
Northeastern University

ISSN: 2753-7064
ISSN: 2753-7072 (eBook)

ISBN: 978-1-83558-555-9
ISBN: 978-1-83558-556-6 (eBook)

Publication of record for individual papers is online:
https://www.ewadirect.com/proceedings/chr/home/index

Copyright © 2024 The Authors
This work is fully Open Access. Articles are freely available to both subscribers and the wider public with permitted reuse. No special permission is required to reuse all or part of article, including figures and tables. For articles published under an open access Creative Common CC BY license, any part of the article may be reused without permission, just provided that the original article is clearly cited. Reuse of an article does not imply endorsement by the authors or publisher.
The publisher, the editors and the authors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the editors or the authors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This imprint is published by **EWA Publishing**
Address: John Eccles House, Robert Robinson Avenue, Oxford, England, OX4 4GP
Email: info@ewapublishing.org

Committee Members

ICIHCS 2024

General Chair

Heidi Gregory-Mina, *Northeastern University*

Organizing Chair

Nafhesa Ali, *Northumbria University*

Organizing Committee

Kwasu Tembo, *Lancaster University*
Enrique Mallen, *Sam Houston State University*
David T. Mitchell, *The George Washington University*
Kurt Buhring, *Saint Mary's College*
Roberto Di Ceglie, *Pontifical Lateran University*
Andrea Aguti, *University of Urbino*
George Lazaroiu, *Spiru Haret University*
Muhammad Idrees, *University of Agriculture, Faisalabad*
Ni Lu, *Chinese Academy of Social Sciences*
Yue Qian, *Hong Kong Baptist University*
Xiao Ma, *Peking University*
Wenliang Lin, *Beijing University of Posts and Telecommunications*

Technical Program Chair

Sara Mashayekh, *The University of New South Wales Sydney*

Technical Program Committee

Javier Cifuentes-Faura, *University of Murcia*
Aquasia Shaw, *University of Texas at Austin*
Abdullah Laghari, *Quaid-e-Awam University of Engineering, Science and Technology*
Matilde Lafuente-Lechuga, *University of Murcia*
Yuanyue Hao, *University of Oxford*
Yuanyuan Fan, *Academy of Art and Design, Tsinghua University*
Luke Qiu, *University of Wisconsin-Madison*
Liang Guo, *Zhejiang University*

Yue Qi, *Renmin University of China*
Xiaoyu Xiahou, *Chinese Conservatory of Music*
Yuzhou Sun, *Fudan University*
Ruichang Ding, *Beijing Normal University*
Shaohang Liu, *University of International Business and Economics*

Publicity Committee

Nasir Mahmood, *University of Sialkot*
Hira Iftikhar, *University of Agriculture, Faisalabad*

Preface

The 3rd International Conference on Interdisciplinary Humanities and Communication Studies (ICIHCS 2024) is an annual conference focusing on research areas including literary studies, art history, philosophy, sociology and communication. It aims to establish a broad and interdisciplinary platform for experts, researchers, and students worldwide to present, exchange, and discuss the latest advance and development in all facets of literary studies, art history, philosophy, sociology and communication.

This volume contains the papers of the 3rd International Conference on Interdisciplinary Humanities and Communication Studies (ICIHCS 2024). Each of these papers has gained a comprehensive review by the editorial team and professional reviewers. Each paper has been examined and evaluated for its theme, structure, method, content, language, and format.

Cooperating with prestigious universities, ICIHCS 2024 organized three workshops in Boston, Newcastle-Upon-Tyne and Sydney. Dr. Heidi Gregory-Mina chaired the workshop "Communication in the Age of Artificial Intelligence", which was held at Northeastern University. Dr. Nafhesa Ali chaired the workshop "Researching Symmetrically to Explore Exclusion, Othering and Whiteness in Local Policy Making", which was held at Northumbria University. Dr. Sara Mashayekh chaired the workshop "Transforming Education: The Sociological and Pedagogical Impact of Generative AI and Learner Autonomy", which was held at The University of New South Wales.

Besides these workshops, ICIHCS 2024 also held an online session. Eminent professors from top universities worldwide were invited to deliver keynote speeches in this online session, including Dr. Heidi Gregory-Mina from Northeastern University, Dr. Nafhesa Ali from Northumbria University and Dr. Sara Mashayekh from The University of New South Wales. They have given keynote speeches on related topics of literary studies, art history, philosophy, sociology and communication.

On behalf of the committee, we would like to give sincere gratitude to all authors and speakers who have made their contributions to ICIHCS 2024, editors and reviewers who have guaranteed the quality of papers with their expertise, and the committee members who have devoted themselves to the success of ICIHCS 2024.

Dr. Heidi Gregory-Mina

General Chair of Conference Committee

Workshops

Workshop – Boston: Communication in the Age of Artificial Intelligence



November 29th, 2024 (UTC-5)

D'Amore-McKim School of Business, Northeastern University

Workshop Chair: Dr. Heidi Gregory-Mina, Professor in Northeastern University

Workshop – Newcastle-Upon-Tyne: Researching Symmetrically to Explore Exclusion, Othering and Whiteness in Local Policy Making



September 23th, 2024 (GMT+1)

Department of Social Sciences, Northumbria University

Workshop Chair: Dr. Nafhesa Ali, Professor in Northumbria University

Workshop – Sydney: Transforming Education: The Sociological and Pedagogical Impact of Generative AI and Learner Autonomy



October 28th, 2024 (UTC+11)

School of Education, The University of New South Wales

Workshop Chair: Dr. Sara Mashayekh, Researcher in The University of New South Wales

The 3rd International Conference on Interdisciplinary Humanities and Communication Studies

ICIHCS 2024

Table of Contents

Committee Members ·····

Preface ·····

Workshops ·····

Postmodernism Elements in William Falkner's As I Lay Dying ····· 1
Sibei Chen
Exploring the Effect of Exercise in Assisting the Treatment of Depression ····· 10
Yinghong Ma
Advances in Research on the Relationship Between Social Media Use on Female's Body and Appearance Image Anxiety ····· 17
Lixia Liu
A Mirror for Men? Feminist Activism of #ImitatingGreasyMen in China ····· 25
Yaqi Liu
Can Pain Be Understood by Words? – A Literature Review of Pain-Language Association ··· 36
Yanjie Jin
The Rural-Urban Intermarriage and Female Identity Formation in Contemporary China ····· 44
Peini Li
Exploring the Identity of Chinese Cultural Relics on British Museum Websites Through Multimodal Discourse Analysis: A Case Study of the Official Website ····· 50
Heting Feng
Japan's Lost Thirty Years: From Post-War Miracle to Bursting Bubble ····· 61
Runze Dong
Network Practice of Rare Disease Bloggers and Life Narrative: Take ALS as an Example ····· 68
Jiaxin An
Social Inequality in the Age of AI: Implications for Labor, Wage Distribution, and Worker Power ····· 80
Xiao Jia
Effects of Homophone Priming on the Decision-Making in Perceptual Color Recognition of Mandarin Speakers ····· 88
Boyang Li
The Role of Motivation in Decision-Making and Underlying Neural Mechanism ····· 100
Jiale Wei

The Impact of Meritocracy on Higher Education: A Perspective from College Admissions Policies in Mainland China 107
Siyu Du
Academic Procrastination of High School Students as a Product of Low Self-Esteem: A Mediation Role of General Self-Efficacy 116
Jiaye Liu
The Role of Political Institutions in the Economic Development of Different Countries: A Comparative Study Between the United Kingdom and China 126
Tianqi Xiong
Opioid-Induced Neuroplasticity: Insights from Animal Models 137
Zhaolin Yang
The Benefits of Incorporating Phonology and Morphology in English Education 144
Zongxuan Yu
The Effectiveness of Ketamine Treatment on Depression 150
Yichen Liu
The Symbolization of Violence Aesthetic and Cultural Integration in One Piece: A Case Study of the Thriller Bark Chapter 157
Siyuan Lu
The Role of Stress in Obesity and Relevant Interventions 165
Menglin Guan
Structural and Coherence Analysis Towards The Renunciation 172
Tian Le
Exploring the Impact of Gamification on STEM Learning in Education: The Mediating Role of Facilitating Focus 179
Wanting Su
Research on Cultural Consumption from the Perspective of Mental Accounting 189
Jefferson Tianyu Fang
Analysis of the Main Contradictions and Solutions in Achieving Educational Equity under China's "Double Reduction" Policy 196
Xinru Liu
Research on the Speed of Information Transmission and User Cognition in the New Media Era 204
Juewei Wang
Neuroplasticity and Cocaine Exposure During Adolescence 211
Xinyi Zeng
Research on the Impact of Gender Role Perceptions on Women's Educational Opportunities in Urban and Rural China 219
Miya Li
Analysis of Gender and Mental Health Differences 227
Zhulin Li

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242173

Postmodernism Elements in William Falkner's As I Lay Dying

Sibei Chen[1,a,*]

[1]*School of Foreign Languages, Beihang University, Beijing, 100191, China*
a. 21379257@buaa.edu.cn
**corresponding author*

Abstract: This paper delves into the profound postmodernist traits embodied in William Faulkner's novel, *As I Lay Dying*, particularly focusing on the concepts of "indeterminacy" and "immanence". Initially, the paper establishes a clear understanding of postmodernism, outlining its definition and characteristics, encompassing Ihab Hassan's theory and conceptualizations of indeterminacy and immanence. Subsequently, the analysis shifts to the exploration of indeterminacy embodied in *As I Lay Dying*, highlighting its manifestation in the narrative through mentally challenged narrators such as Vardama and the "normal" yet mad Darl. Furthermore, the paper examines the indeterminacy in the plot's progression and the ambiguity of its overarching theme. Beyond indeterminacy, the work also showcases immanence, evident in the stream-of-consciousness narrative, the mission formula, and the profound inner strength of the characters. By dissecting these postmodernist facets, the paper unveils the unique allure and profound depth of *As I Lay Dying* as a postmodern literary work, emphasizing Faulkner's mastery of the craft and the profoundness of his spirit. Overall, this paper offers a fresh perspective on the novel, serving as a valuable reference for understanding both the work itself and the broader scope of postmodern literature.

Keywords: Postmodernism, William Falkner, Indeterminacy, Immanence

1. Introduction

William Faulkner (1897-1962), as a pioneer and representative figure of American literature, has garnered widespread praise for his unique narrative style, profound exploration of themes, and exquisite literary skills. He was awarded the Nobel Prize in Literature in 1949. Throughout his lifetime, Faulkner authored 19 novels and over 120 short stories, most of which are centered around his fictional "Yoknapatawpha Saga." This vast literary system takes place in the small southern American town of Jefferson and its surroundings, telling the stories of several generations of families belonging to different social classes, spanning from 1800 to after the Second World War.

As I Lay Dying, one of the significant works in Faulkner's "Yoknapatawpha Saga", was published in 1930. Faulkner once claimed that this novel was his tour de force. Centering around the "Odessey" of the southern American farmer family, the Bundrens, who embark on a journey to transport their deceased wife's body back home for burial in accordance with their promise to her, the novel utilizes multi-narrative inner monologues and stream-of-consciousness to reveal the intricate emotional entanglements and inner conflicts among family members.

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242173

Research on Faulkner in the 20th century largely focused on modernist literary characteristics, while by the early 21st century, studies shifted to exploring the relationship with postmodernism. The academic circle has already conducted some research on the postmodernism of Faulkner's novel The Sound and the Fury, but as one of the important works of his Yoknapatawpha saga, the research on the postmodernist elements presented in *As I Lay Dying* has not yet appeared. Ihab Hassan identified the fundamental characteristics of postmodernism as "indeterminacy" and "immanence" in his work The Postmodern Turn: Essays in Postmodern Theory and Culture. Undoubtedly, *As I Lay Dying* exhibits remarkable those postmodernist elements.

"Indeterminacy" encapsulates diversity, ambiguity, randomness, rebellion, and abnormality, representing the dissolution of all established orders and structures. "Immanence" signifies the individual's inherent adaptability to the environment, reality, and creativity. Hassan argues that postmodernism no longer possesses transcendental qualities and has shifted its focus away from traditional concepts such as spirit, value, and truth. Instead, it manifests as a retraction of the subject and an inward adaptation to the object.

Drawing inspiration from Ihab Hassan's seminal work, The Postmodern Turn, this paper endeavors to unearth the intricate postmodernist tenets embodied in William Faulkner's *As I Lay Dying*. Specifically, it focuses on the aspects of "indeterminacy" and "immanence" as outlined by Hassan, exploring their manifestation in the novel's narrative structure, plot development, and overarching themes. By delving into the stream-of-consciousness techniques and intricate interior monologues, the paper aims to illuminate the ambiguous, often surreal world envisioned by Faulkner, thereby reflecting the dismantling of traditional narrative frameworks and the individual's inward adaptability in the face of a fragmented reality.

2. The Theoretical Foundation

In order to study the postmodernist elements in Faulkner's novels, it is necessary to understand the definition of postmodernism, which is quite complicated. This chapter aims to provide the theoretical foundation of postmodernist characteristics based on the theory proved by Ihab Hassan, which could provide clues to the trace of postmodernism in Faulkner.

2.1. The Definition of Postmodernism

Postmodernist literature emerged as a widespread literary trend in Western society after the Second World War, peaking during the 1970s and 1980s. While it continues and builds upon the literary ideologies and creative techniques of modernism, its distinguishing characteristics have transcended the scope encompassed by traditional "modernism," hence its recognition as an independent literary trend. Postmodernist literature is not a concept with a fixed or unequivocal definition. It encompasses a diverse range of literary schools, primarily including absurdist drama, the nouveau roman, and black humor novels.

Postmodernist literature is characterized by several prominent features. Firstly, it adheres to a principle of indeterminacy, manifesting in the ambiguity of themes, images, plots, and language. Secondly, it exhibits a pluralistic approach to creation, which is intertwined with the multiplicity of postmodern culture and reflects the convergence of postmodernism with modernism, realism, and romanticism. Lastly, it engages in linguistic experimentation and discourse games, highlighting its "language-centered" nature.

In summary, postmodernist literature, with its unique creative principles, pluralistic methods, and profound exploration of language, has opened new directions for the development of Western literature and exerted profound influence on subsequent generations.

DOI: 10.54254/2753-7064/40/20242173

2.2. The Characteristics of Postmodernism

2.2.1. Ihab Hassan and The Postmodern Turn

Ihab Hassan is one of the earliest scholars to describe and theorize postmodernism, hailed as the "father of postmodernism." His articles on postmodernism's theoretical thought are collected and published in The Postmodern Turn: Essays in Postmodern Theory and Culture. In this book, Hassan analyzes and elaborates on the postmodernist phenomena manifested in literary works. He gives "postmodernism a more identifiable identity," creating the concept of "indetermanence" to summarize the fundamental characteristics of postmodernism, illustrating its deconstruction and reconstruction.

Hasan also commented on the postmodernism in Faulkner's works. He argued that "while Faulkner avoids the nihilistic tendency of postmodernism and attempts to transcend it in his novels, his spirit remains closely related to the postmodern society."

2.2.2. The Concept of Indeterminacy and Immanence

The emergence of Hassan's idea of "indetermanence" underwent a process of contemplation. Hassan first examined the rebellious tradition of avant-garde literature, proposing "silent literature" and revealing the rebellious and hopeful voices beneath the appearance of silence—the "angry shouts" and "apocalyptic tones." Building on this, Hassan summarized the fundamental feature of postmodernism as "indetermanence," encompassing "indeterminacy" and "immanence," two core and constitutive tendencies of postmodernism. "Indeterminacy" embodies the disintegration and rebellious force in postmodernist culture, while "immanence" is a creative force inherent in human beings, latent beneath this mad deconstruction. If "indeterminacy" is the objective context, then "immanence" is the proactive creativity in the face of indeterminacy.

Hassan is extremely assertive in his interpretation and research on postmodernism. He not only negates the explorations of theorists such as Abrams and Nelson Goodman on postmodernism, mocking them for not understanding the postmodernism they have studied their entire lives, but also considers Habermas' distinction between premodernism, antimodernism, and postmodernism as "futile." According to Hassan, some theorists negate the positive value and future-oriented tendency of postmodernism based on modernist thinking. However, postmodernism not only stimulates the diversity of discourse but also brings new vitality to it: postmodernism contains the idea of deconstruction, but deconstruction breeds the power of reconstruction, implying a trend of reconstruction. According to Hassan, the essence of postmodernism lies in the indeterminacy of discourse, which is embedded in immanence, namely, the trend of deconstruction and the coexisting trend of reconstruction.

Hassan's theory of postmodernism's indeterminacy and immanence demonstrates a powerful spiritual force, a resilience that can rebuild after shattering [1]. As most studies on the postmodernism in Faulkner's novels focus on the postmodernist ideas and techniques embodied in his novels, undoubtedly, Faulkner's works exhibit the main postmodernist characteristic of "indeterminacy" in terms of plot, characters, and themes, deconstructing the authoritative voice and unified meaning of traditional novels and exhibiting indeterminacy in themes. These works transcend modernism in both ideas and narrative techniques. However, more importantly, the power of reconstruction embedded in postmodernism in his novels, namely immanence, is rarely noticed. This creative force latent beneath the appearance of mad deconstruction is the true value waiting to be explored.

DOI: 10.54254/2753-7064/40/20242173

3. Indeterminacy Embodied in *As I Lay Dying*

3.1. The Indeterminacy of the Narrative

As I Lay Dying presents multiple aspects of the story through fifty-nine sections of inner monologues of the Bundren family, their neighbors, and related personnel, totaling 15 characters. This narrative technique makes it difficult for readers to understand the entire story from a single perspective or logical chain, increasing the indeterminacy of the narrative. Meanwhile, Faulkner's portrayal of characters also embodies the indeterminacy of the narrative. The characters in the novel are complex and diverse, possessing both kind and loyal aspects as well as selfish and indifferent ones. This complexity makes it difficult for readers to simply categorize the characters into a certain type or personality trait when understanding them, requiring a comprehensive consideration of their words, actions, and inner world. This complexity in character portrayal also adds to the complexity and indeterminacy of the narrative.

"*As I Lay Dying* is an original fable about human endurance, primarily depicting the mad and painful "Odyssey" of ordinary people bearing various spiritual traumas" [2]. The narrative of the novel relies on this group of traumatized and suffering people. Both biologically insane individuals and those who deviate from social norms or rationalism in a sociological sense are collectively referred to as madmen. The former manifests as mental retardation, abnormal speech and behavior, while the latter are those who deviate from rationality yet firmly believe they are following it, acting unconventionally and thus being marginalized by mainstream society as "others"[3].

This chapter conducts an in-depth analysis of the mad images in the characters to reveal the spiritual characteristics and causes of the mad images in Faulkner's *As I Lay Dying*, and further explores the unreliable narrative features and linguistic characteristics of the madmen to analyze the reasons for the unreliable narrative of the madmen as the narrative subjects. The author mainly selects Vardaman- the mentally disabled and the most 'normal' madman- Darl, for in-depth analysis.

3.1.1. Vardaman- the Mentally Disabled

People with dementia usually have congenital intellectual disabilities, manifesting "all possible negative feelings: confusion, disintegration of thought, mistake, illusion, irrationality, and non-truth"[4]. In *As I Lay Dying*, Vardaman is precisely a role with congenital dementia. Faulkner gives him the right to narrate in nine chapters, trying to reproduce the absurdity and the confusion of social and value orders through his inner monologue.

Vardaman is the child with the lowest sense of presence in the Bundren family, because of his low intelligence, he often does some incredible things. He listens carefully to his mother's voice in the coffin with Darl, and he even thinks that his mother can come out from the holes on the coffin and go into the water. After Darl was caught in a mental hospital, only Vardaman kept saying, "Darl, Darl, Darl is my brother, my brother is Darl." He uses childish language to talk about the absurdity and expresses with wild imagination. It is difficult for him to describe things like ordinary people, but he will focus on describing inner feelings and sensory experiences. He confuses his mother with a big fish and even mistakes his mother's body for a big fish, trying to use a drill to destroy the coffin to "release" her. To a large extent, in his cognition, there is no difference between humans and animals. When his mother's death coincided with the death of a fish, Vardaman, stimulated, blindly yielded to his illusion and naturally regarded his mother as the fish killed by someone. Although this behavior seems absurd, it fully reflects his deep affection for his mother and the fact that he cannot accept the reality of his mother's death.

The most common sentence in Vardaman's monologue is, "My mother is a fish." This sentence appears 8 times in the work, and is even the only content in Chapter 19. This simple but much-watched

DOI: 10.54254/2753-7064/40/20242173

metaphor serves as a metaphorical structure and becomes the defining statement of this novel[5]. The absurdity of such a defining statement spoken by a dementia child also highlights the indeterminacy of the narrative.

3.1.2. The Most "Normal" Madman, Darl

Darl appears most frequently in the novel. He is the leading character and the whole book is basically narrated from his perspective. Among Darl's chapters, there is one that is the only one narrated in the third person, indicating the importance of this character.

Faulkner said in his lecture at the University of Virginia in 1957, "Darl was crazy from the start. He became more and more crazy because he didn't have the ability - it was more inertia than sanity - to resist all the disasters that happened in the family"[6]. The complexity of Darl lies not only in his madness but also in the dual identity that Faulkner gave him. Darl is both a madman and a prophet. His narrative is omniscient and he is able to see the whole picture, but at the same time, his narrative is also deeply entrenched in the manic pain of searching for himself, actively resisting yet still being ignored.

As a prophet, he observes those around him closely and knows their actions intimately. He knows that his sister Addie's main purpose for accompanying the funeral is for an abortion; he knows that his brother Jewel is an illegitimate child; he would expose his sister Addie's untold secrets in front of her; and he would persistently ask Jewel, the illegitimate son, who his father is. He saw the absurdity of the funeral procession and wanted to set fire to the coffin to end the farce, but was eventually reported by Addie and forcibly sent to a mental hospital. In the misadventure of the funeral journey, Darl saw through the absurdity and irony of the journey. Although his original intention was to save his family from suffering under his mother's revenge plot, he adopted extreme methods of solving problems like a madman, leading to his being rejected by his family. If he were just an incoherent idiot like Vardaman, people would only observe him indifferently and ignore him, but Darl's extraordinary abstract thinking and prophetic talent destined him to become the object of everyone's aversion and attack.

He is like a mirror, reflecting the ugliness of anyone in front of him. As the most sober and normal person in the book, Darl's ultimate fate is to be sent to a mental hospital. This ironic arrangement is full of absurdity and ridicule, making Darl's narrative also full of indeterminacy.

3.2. The Indeterminacy of the Plot

In *As I Lay Dying*, Faulkner utilizes a series of innovative and intricate narrative techniques to shatter the traditional linear narrative structure of novels, injecting a significant degree of indeterminacy into the plot development, thereby maintaining readers' high interest and contemplation throughout the reading process.

Firstly, the novel adopts a nonlinear narrative technique, fragmenting the timeline into multiple segments and continuously jumping and backtracking in the narration. This narrative approach complicates the plot development and makes it unpredictable, requiring readers to constantly adjust their perception of time to understand the connections between these segments and the overall story progression. The jumping and backtracking of time not only disrupts the linear order of time but also shatters readers' psychological expectations, enhancing the indeterminacy and polysemy of the work. For instance, Faulkner reveals the overarching conflict of the story at the beginning: Addie Bundren is terminally ill and wishes to be buried in her mother's family cemetery forty miles away. The Bundren family agrees to her request and prepares for her funeral. Throughout the storytelling, Faulkner disrupts the linear structure and temporal and spatial development of the narrative. Addie's internal monologue appears after her death, a significant temporal dislocation that brings the narrative

DOI: 10.54254/2753-7064/40/20242173

to a climax, revealing the protagonist's true thoughts and unraveling the mysteries surrounding this eccentric family.

Moreover, the novel employs a multi-perspective narrative style, where each narrator possesses a unique perspective and varying degrees of distance from the central event, resulting in differences in the reliability and authenticity of their narratives. This multi-perspective narrative approach enables readers to delve deeper into each character's inner world, yet it also complicates and introduces indeterminacy into the plot development. Readers must synthesize the narratives of multiple narrators to piece together the complete storyline. The interplay and collision of multiple perspectives endow the story's development with numerous variables and uncertainties. In terms of narrative frequency, "repetitive narrative" refers to the multiple recounting of a single event; while in terms of internal focalization, "multiple focalization" involves different focal characters narrating the same event from different perspectives [7]. For instance, readers initially believe that Darl's efforts to procure an abortion drug will be successful, but the disappointing result leaves them uncertain. The emotional turmoil caused by Jewel's horse being sold further obscures predictions of his next actions. Moreover, Anse's selfishness and indifference as the patriarch of the family confuse readers about his true intentions. These local conflicts and uncertainties intertwine to form the core of the entire story, maintaining readers' heightened tension and curiosity throughout the reading process, and imbuing the plot development with profound indeterminacy.

3.3. The Indeterminacy of the Theme

As I Lay Dying does not have a specific theme, but instead showcases the complexities of human nature, the ambiguities of morality, and perspectives on life and death, all of which greatly enrich the connotations of the work. However, these themes inherently possess a degree of vagueness and indeterminacy. Moreover, while the novel delves into these themes, it refrains from offering definitive answers or conclusions, leaving room for readers to discover their own understanding.

Firstly, Faulkner reveals the multifaceted complexities of human nature through the inner monologues of the Bundren family. Each family member harbors their own desires, aspirations, and fears, and their actions and choices are often influenced by multiple factors rather than a single motive. For instance, while Anse Bundren appears to act out of a sense of duty to his wife and family, in reality, he longs to escape from his wife Addie's control and pursue a new life for himself. Additionally, even though Addie has passed away, her influence on the family remains pervasive, and her death becomes the catalyst for their actions, highlighting the profound complexities of human nature. Furthermore, the family members often exhibit both selfish and altruistic tendencies when faced with adversity. They strive to protect their own interests while also feeling a sense of responsibility towards their family. This complexity adds a layer of indeterminacy to their actions and choices, making it more challenging for readers to comprehend and interpret the novel's themes.

At the same time, the actions of the characters in the novel are often difficult to evaluate using traditional moral standards. For example, while Anse Bundren's actions may seem selfish, his commitment to his wife and sense of responsibility towards his family also reflect a certain moral value. Similarly, while Addie's death may be a relief, her existence had a complex impact on the family, including both positive and negative aspects.

Faulkner's exploration of views on life and death also embodies the indeterminacy of the themes. Addie's death serves as both a liberation and a trigger for the family's conflicts. It complicates and intensifies the relationships among family members, while also provoking their reflections on life, death, fate, and the meaning of life. Life and death are not simply a binary opposition; rather, they intermingle and influence each other. Death is not the end of life, but an essential part of the life process. Facing death allows people to gain a deeper understanding of the fragility and preciousness of life, and to cherish their current life and relationships even more.

DOI: 10.54254/2753-7064/40/20242173

4. Immanence Embodied in *As I Lay Dying*

Postmodernism has a tendency of deconstruction, and in Hassan's theory of postmodernism, immanence, as another essential feature, demonstrates the power of reconstruction. The purpose of postmodernism is not to expel literary art, but to restore it to its rightful place. Deconstruction helps to break down modernism's belief in the classics, shattering the facade and inherent restraint of modern discourse. "Immanence" is the source of power to rebuild oneself, re-observe the world and society, reflecting the inherent initiative and creativity of human beings in the face of indeterminacy, and manifesting a constructive trend with creative significance.

Although the novel *As I Lay Dying* is an important member of Faulkner's Yoknapatawpha, its theme deviates significantly from other members: it hardly touches upon slavery, race relations, family history, war, and other topics that Faulkner was passionate about. There seems to be no invasion or influence of industrial civilization in the text, nor does it feel the oppression of historical burdens [8]. The Bundren family in the novel is more like a group of primitive mountain people wandering in the wilderness, and their funeral journey can be called "Odyssey". This funeral journey is not only the real-life experience of the Bundren family as individuals, but also their exploration and pioneering of their own and each other's inner world. Faulkner centered the work around inner monologues and employed a horizontal stream of consciousness, not only to examine and reveal the ugliness, darkness, and evil in human nature in the spiritual wilderness but also to reveal the immortal glow emanating from the complexity of these human natures, reflecting a firm belief in the ultimate ability of humans to rebuild themselves.

4.1. The Stream of Consciousness

The most significant difference between stream-of-consciousness novels and other types of novels lies in their syntactic and stylistic characteristics. Stream-of-consciousness novels are characterized by irrationality and unconsciousness, de-emphasizing plot development and using rich and free associations to interpret the stories the authors want to express, presenting readers with a sense of vagueness and confusion.

In Jewel's sole monologue, he repeatedly uses the same phrases, even omitting punctuation, reflecting his inner turmoil and struggle. With an awkward identity and a misunderstood fate, yet a proud personality, he often feels perplexed and unable to express himself in normal language. Dewey Dell also employs long and complex sentences with a mess of ideas, attempting to conceal straightforward facts. In Chapter 30, Faulkner even grants her several hundred words of uninterrupted narrative without any punctuation. Vardaman's narrative best embodies the language's "tendency to make the human mind adapt to all reality as it is in itself" [9].

He lives in a world defined by his own creations, and his chaotic language even possesses the ability to "summarize itself in symbols, intervene in nature more and more, react on itself by abstraction, and thus become more and more intensely and directly its own environment"[9]. He has given definitional language such as "My mother is a fish," and has also said, "He killed her. He killed her." As a child with dementia, Vardaman's words are not reliable, but often it is children who speak the truth bluntly.

Faulkner's stream-of-consciousness technique perfectly embodies the power of "immanence." Through the first-person narratives of different characters, he directly conveys the feelings, desires, and contradictions within each character's inner world. This direct portrayal of the inner world unconsciously shapes the appearance of the world, allowing readers to gain a deeper understanding of the characters' inner drives and feel their inner creativity.

DOI: 10.54254/2753-7064/40/20242173

4.2. The Mission Formula and The Inner Power of Characters

Yoknapatawpha is a mythological world created by Faulkner based on his hometown, which first appeared in his third novel "Sartoris". Meletinsky believes that the revival of myth in the 20th century literature is mainly due to two reasons. First, the crisis of the capitalist civilization has forced people to resort to the common psychological and metaphysical origins of mankind, striving to find a way out that transcends social-historical and space-time limitations. Second, myth, due to its inherent symbolic nature, is suitable for expressing the eternal patterns of individual and social behavior as well as some basic laws in humanity and nature [10]. Faulkner once said, "Since 'Sartoris', I have found that my own postage stamp-sized piece of land is worth writing about, and I will never exhaust it in my lifetime. By turning reality into a virtual world, I can unleash my talent. ... So, I created a world that belongs to me."

In *As I Lay Dying*, the main characters of the novel, the Bundren family, are all anti-heroic figures: Anse cannot sweat; Addie dies in misery; the eldest son Cash can only work in a wooden way; the second son Darl is incompatible with the environment and eventually enters a mental hospital; the third son Jewel is the son of his mother and a lover, with a bad temper and easy to anger; the daughter Dewey Dell is unmarried and pregnant, and is eventually cheated out of her money for an abortion; the youngest son Vardaman is mentally impaired. However, it is these anti-heroic figures that demonstrate a sense of mission without hesitation. They accept their mission, endure various tests, and ultimately complete their mission. Driven by fate or innate nature, the protagonist embarks on a journey with a mission, enduring various rigorous tests (such as floods, fires, and death) and ultimately fulfilling his mission. In the novel, Jewel courageously rescued the coffin from the floodwaters and blazing fires twice, demonstrating his bravery and self-sacrificing spirit. Meanwhile, Cash's loyalty to his mother, his resilience and endurance in bearing pain, as well as Dewey Dell's attentive care for Cash and Vardaman, were all noteworthy. Even the usually indolent and trivial Anse seemed particularly determined, determined to fulfill his promise to his wife and carry on the journey despite all natural and human obstacles.

Faulkner utilizes these anti-heroic characters and the setting of mission patterns to express his yearning for ideals through untraditional methods, revealing that humans will never stop thinking about their future and interests under objective circumstances, reflecting the immanence characteristics of postmodernism.

5. Conclusion

William Faulkner's *As I Lay Dying*, as a significant work within his "Yoknapatawpha Saga," not only demonstrates Faulkner's unique narrative style and profound insights into human nature and social changes but also encapsulates multiple elements of postmodernism. Through the exploration of indeterminacy and immanence, we can glimpse how Faulkner integrates these core characteristics of postmodernism into his narrative art, crafting a literary world that is both realistic and surreal, concrete and ambiguous.

In *As I Lay Dying*, Faulkner masterfully employs indeterminacy as a driving force for narrative and plot development. Through multiple perspectives of different characters, readers are able to observe the multifaceted aspects of the same event from fragmented narratives, thereby provoking profound reflections on authenticity and objectivity. Meanwhile, the themes in the novel also exhibit a sense of indeterminacy, transcending traditional moral judgments and value systems, forcing readers to confront their own subjectivity and biases in the interpretation process. This indeterminacy not only enriches the novel's connotation but also gives it broader practical significance and profound philosophical contemplation.

DOI: 10.54254/2753-7064/40/20242173

Immanence in *As I Lay Dying* manifests as Faulkner's profound exploration of the inner world of characters and the subjective creativity of these anti-heroic figures towards fate and the environment. Through techniques such as stream of consciousness and inner monologue, Faulkner successfully integrates the characters' inner world with the external world, allowing readers to sense every emotional fluctuation and thought leap within the characters. This immanence not only renders the characters more realistic and complex but also enhances the novel's appeal, highlighting the inherent resilience of humanity.

In conclusion, as a novel with postmodernist elements, *As I Lay Dying* offers a valuable window for people to understand and study postmodernist literature through its unique narrative style, profound thematic exploration, and exquisite artistic techniques. Through the exploration of indeterminacy and immanence, Faulkner not only successfully constructs a complex and multidimensional literary world but also provides us with a novel way of thinking and aesthetic experience. Therefore, *As I Lay Dying* is not only the pinnacle of Faulkner's literary creation but also an important work in the history of postmodernist literature.

References

[1] *Liu, J. (2023). A study of Hasan's thought of 'Indeterminacy-Inherence' [Master's thesis, Qufu Normal University].*

[2] *Li, W. (1985). The Heart of Yoknapatawpha: An analysis of six significant works by William Faulkner. Foreign Literatures, 04. doi:10.16345/j.cnki.cn11-1562/i.1985.04.001.*

[3] *Liang, L. (2022). A study of the narrative of madness in William Faulkner's As I Lay Dying [Master's thesis, Shaanxi Normal University].*

[4] *Foucault, M. (2016). History of Madness (L. Zhiming, Trans.). Beijing: Sanlian Bookstore.*

[5] *Olsen, K. (2010). Raveling out like a looping string: As I Lay Dying and regenerative language. Journal of Modern Literature, 33(4), 95-111.*

[6] *Weinstein, P. M. (Ed.). (1995). The Cambridge Companion to William Faulkner. Cambridge University Press.*

[7] *Shang, B. (2010). Misinterpreted motherly love: Narrative judgment in Toni Morrison's new work Mercy. Foreign Literature Studies, 32(4), 60-69. doi:10.19915/j.cnki.fls.2010.04.008.*

[8] *Liu, G. (2005). As I Lay Dying in the sequence of wilderness literature. Journal of Sichuan International Studies University, 03, 14-17.*

[9] *Hassan, I. (Ed.). (year). The Postmodern Turn: Essays in Postmodern Theory and Culture.*

[10] *Meletinsky, Y. (1990). The Poetics of Myth (W. Qingzheng, Trans.). The Commercial Press. pp. 3-4.*

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242193

Exploring the Effect of Exercise in Assisting the Treatment of Depression

Yinghong Ma[1,a,*]

[1]*North China University of Science and Technology, Tangshan, Hebei Province, 063200, China*
a. 2834643041@qq.com
**corresponding author*

Abstract: Depression is a prevalent mood disorder that significantly impairs the quality of life for those affected. Studies have indicated that exercise offers significant benefits in the treatment of depression. Exercise not only ameliorates the emotional state, self-perception, and sleep quality of individuals with depression but also facilitates the production of neurotransmitters such as serotonin and dopamine, which play a regulatory role in mood and enhance the capacity of patients to combat depression, thereby assisting in treatment. Among these neurotransmitters, serotonin is considered the most critical. This study aims to investigate the effect of exercise in adjunctive therapy by examining the mechanism of serotonin in treating depression and the influence of exercise therapy on serotonin levels. Findings suggest that exercise therapy has a substantial effect on serotonin levels and can serve as an adjunctive treatment for depression. As an adjunctive treatment, exercise therapy can reduce treatment costs and provide a therapeutic option for patients who cannot undergo pharmacological treatment. Additionally, as a non-pharmacological treatment method, exercise holds significant meaning for the treatment of depression and warrants further promotion and application in clinical practice.

Keywords: Depression, Exercise Therapy, 5-HT, Serotonin

1. Introduction

With the rapid development of society, individuals increasingly face high levels of stress in their work and lives, coupled with a lack of physical exercise. This not only leads to a decline in physical immunity and susceptibility to illness but also poses significant risks to mental health, resulting in diseases such as depression and anxiety. Depression has become a common mental health issue in contemporary society. Statistics indicate that depression leads to millions of people worldwide seeking mental health services and treatment due to its severe impact on daily life. Depression not only affects the emotions of those suffering from it but can also impact their normal functioning, with severe cases potentially leading to suicidal behavior. Over the past few decades, researchers have explored various methods for treating depression, including pharmacotherapy, psychotherapy, and physical therapy. Among these, exercise as a non-pharmacological treatment has garnered considerable attention. Current research suggests that exercise can play a role in the prevention and adjunctive treatment of depression, although a direct causal relationship between depression and exercise has yet to be established. Exercise therapy, despite its low cost, requires a long-term commitment, which many patients find challenging to maintain [1]. This study aims to review the

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242193

impact of exercise therapy on serotonin levels to explore its influence in the adjunctive treatment of depression. Exercise therapy, when integrated as an adjunctive treatment, can enhance the function of the heart and lungs, improve immune system capacity, and positively affect emotions [2]. As an adjunctive treatment for depression, exercise first provides an alternative for patients who are unwilling to accept pharmacological treatment. Furthermore, exercise therapy can effectively improve psychological health by alleviating negative emotions such as depression and anxiety, thus promoting a pleasant state of mind. While fostering psychological well-being, exercise also enhances overall physical health and reduces the risk of chronic diseases such as cardiovascular diseases and diabetes.

2. Introduction to Depression

2.1. Concept

Depression is a prevalent mental and psychological disorder characterized by a persistently low mood and a lack of interest in daily activities. Patients suffering from depression may experience insomnia, appetite changes, and in severe cases, suicidal tendencies. Depression is categorized into mild, moderate, and severe levels.

2.2. Etiology

The pathogenesis of depression is influenced by a multitude of factors, including genetic, social, and neurobiological elements. Despite extensive research, a definitive etiological mechanism has not been pinpointed. However, several significant hypotheses have been proposed from a biological perspective.

Neurotransmitter Hypothesis: Neurotransmitters play a crucial role in the pathophysiology of depression. These chemical substances facilitate the transmission of information between nerve cells and include serotonin, dopamine, and norepinephrine. This hypothesis suggests that individuals with depression exhibit abnormal levels of neurotransmitters, such as decreased serotonin levels or dopamine imbalances, which impair the normal functioning of the neurotransmitter system, leading to dysregulation of mood and depressive symptoms. The hypothesis supports the exploration of the efficacy of pharmacological and exercise therapies to modulate the neurotransmitter system, thereby improving symptoms and quality of life in patients with depression. Pharmacological treatments often involve selective serotonin reuptake inhibitors (SSRIs) and tricyclic antidepressants, which may alleviate depressive symptoms by modulating the neurotransmitter system. Exercise therapy can promote the release of neurotransmitters such as dopamine and serotonin in the brain, helping to elevate mood and reduce feelings of depression. Additionally, the hypothesis highlights the interaction between different neurotransmitter systems, as well as abnormalities in receptor density and function.

HPA Axis Hypothesis: The hypothalamic-pituitary-adrenal (HPA) axis holds a significant position in the pathogenesis of depression. When individuals face stress, stimuli in the hypothalamus trigger the release of corticotropin-releasing hormone (CRH), which activates the pituitary to release adrenocorticotropic hormone, stimulating the adrenal cortex to secrete cortisol. Excessive cortisol and an imbalanced negative feedback mechanism may lead to functional abnormalities and exacerbate depression. In summary, chronic stress can lead to overactivation of the HPA axis, contributing to depression [3].

Cytokine Hypothesis: Cytokines in the immune system play a vital role in the development of depression. This hypothesis posits that immune activation due to inflammatory responses may lead to the onset of depression. Specifically, chronic inflammatory states can lead to the release of a plethora of cytokines, which can affect the functionality of the nervous system, damage neuronal

DOI: 10.54254/2753-7064/40/20242193

connections, and impact the production and transmission of neurotransmitters, resulting in depression [4]. Persistent inflammatory responses, such as those seen in infectious and immune-mediated diseases, can precipitate depressive symptoms. The cytokine hypothesis offers a novel perspective, suggesting that inflammation and abnormal immune system activation may be associated with the pathogenesis of depression, providing a new angle for studying the pathophysiological mechanisms and therapeutic approaches of depression. Given the multifactorial influences on the etiology of depression, treatment modalities can encompass pharmacological interventions as well as physical approaches such as exercise. Exercise can stimulate an increase in neurotransmitter levels and enhance the brain's stress response, allowing individuals to alleviate stress and regulate emotions [5].

3. Treatment Methods for Depression

The treatment of depression primarily consists of pharmacological and physical therapies. Physical therapies encompass psychotherapy, exercise therapy, Electroconvulsive Therapy (ECT), Transcranial Magnetic Stimulation (TMS), among others [6]. Pharmacological treatment most commonly employs Selective Serotonin Reuptake Inhibitors (SSRIs) and tricyclic antidepressants, which ameliorate depressive symptoms by modulating the neurotransmitter system. However, these medications can have significant side effects, including nausea, sleep disturbances, and sexual dysfunction, impacting normal life. Psychotherapy, particularly Cognitive Behavioral Therapy (CBT), is widely used and aims to alleviate depressive symptoms by helping patients identify and change negative thought patterns and behaviors. Yet, it requires a long treatment period and the cooperation of one or two individuals. Electroconvulsive Therapy (ECT) can be an option for patients who do not respond to other treatments, working by inducing a brief seizure in the brain to alleviate depressive symptoms, but it is costly and may cause memory issues. Exercise therapy is straightforward, side-effect free, and can enhance physical fitness while treating depression.

3.1. Introduction to 5-HT and Its Mechanism in Treating Depression

5-Hydroxytryptamine (5-HT), a derivative of indole and a monoamine neurotransmitter, is found in both the central nervous system and the peripheral system, with independent functions but the same synthetic pathway. Numerous 5-HT receptor subtypes have been identified in mammals, with 5-HT1AR being particularly well-studied and playing a significant role in the central nervous system, including in depression, sleep-wake cycles, eating behavior, and cognitive abilities [7], exerting a substantial influence on emotional stability.

In 1991, Healy D noted that the biochemical basis of depression is largely concentrated on 5-HT, norepinephrine (NE), dopamine (DA), and their receptors, with 5-HT and NE being particularly prominent. Studies suggest a relationship between depression and 5-HT, but the pathogenesis remains unclear. In terms of mood regulation, research indicates that 5-HT modulates the plasticity of the hippocampal structure for mood regulation, but the mechanism is not yet clear. Regarding the control of impulsive emotional responses, studies show neurotransmitter disorders in rats during anger or depression, but the mechanism is not yet clear [7]. In terms of emotional processing, research indicates that 5-HT plays an important role [8].

From the aforementioned studies, it is only proven that 5-HT is related to the regulation of mood by modulating brain areas responsible for emotional regulation, thereby modulating anxiety and depression, but many pathogenic mechanisms are still unclear [7].

DOI: 10.54254/2753-7064/40/20242193

3.2. Physical Therapies

3.2.1. Psychotherapy

Psychotherapy is a treatment method that establishes a good therapeutic relationship with patients, helps them resolve psychological issues, and encourages positive changes. The most commonly used psychotherapy for depression is Cognitive Behavioral Therapy (CBT), which aims to help patients identify and change negative thinking patterns, thereby improving mood and behavior. During treatment, patients are guided to recognize how their thought patterns affect their behavior or emotions and to think about problems positively to alleviate depressive symptoms. Another therapy is insight-oriented therapy, which helps patients express and understand their inner feelings through conversation and interaction with a psychotherapist, discovering and resolving potential psychological issues. Psychotherapists often develop targeted treatment plans based on the patient's condition and needs, and continuously adjust these plans during treatment to achieve the best therapeutic effect.

3.2.2. Exercise Therapy

Exercise therapy refers to the treatment method that promotes mental and physical health through physical exercise such as aerobic exercise, group activities, strength training, and rhythmic movement. Physiologically, exercise promotes the release of neurotransmitters like 5-HT and dopamine in the brain, helping patients alleviate anxiety and depression. Psychologically, it increases self-esteem and reduces stress, thereby alleviating depressive symptoms, and studies have shown [9] that exercise has certain advantages as a first-line treatment for mild to moderate depression compared to medication and psychotherapy. Even in 2016, Canadian guidelines recommended exercise as a first-line treatment for mild depression. Literature also indicates that many patients are unwilling to accept drug treatment or are unable to undergo drug treatment due to physical reasons, and exercise therapy as an adjunctive treatment may be effective for patients [9]. In exercise therapy, therapists also provide personalized treatment based on the patient's physical condition and mental health.

3.2.3. Transcranial Magnetic Stimulation (TMS)

TMS is a relatively safe, non-invasive neuromodulation technique that does not require craniotomy and is a non-invasive treatment method. By placing a coil on a specific scalp location and providing stimulation to modulate neuronal activity, it alleviates depression. TMS can stimulate neuronal activity in the cerebral cortex, regulate nerve conduction and neurotransmitter release, and help patients improve their mood, sleep, and reduce anxiety and depressive emotions, thereby alleviating the symptoms of patients with depression. TMS is suitable for patients who are ineffective in treating depression with medication or cannot tolerate it and can be used to treat depression, anxiety, and occupational diseases. However, TMS is not suitable for all mental illnesses, so a comprehensive assessment of the patient should be conducted before TMS treatment, and personalized treatment should be provided to help patients recover better. TMS has many side effects, such as headaches, scalp discomfort, slight muscle twitching in the target muscles, tinnitus, and even brief memory loss. Therefore, TMS treatment should be carried out in a professional medical institution, and any discomfort should be reported promptly to ensure the safety and effectiveness of the treatment. However, these side effects are not long-term and can be reduced or disappear after the end of the side effects.

DOI: 10.54254/2753-7064/40/20242193

4. The Effect of Exercise Therapy on Depression

4.1. The Effect of Exercise Therapy on 5-HT Levels

Numerous scientists have conducted experiments on animals and humans to determine the influence of exercise on 5-HT. Figure 1 illustrates the experimental procedure for animals, showing that rats were divided into four groups, each consisting of 10 rats, namely the control group, the exercise group, the stress-induced group, and the combination of exercise and stress-induced groups. The control group rats underwent forced swimming tests to confirm the depressive state, followed by euthanasia, brain tissue sectioning, and protein blotting to detect the expression of 5-HT1A in the dorsal raphe. The exercise group rats ran on a treadmill for 30 minutes daily for four weeks. The stress-induced group received inescapable 0.2 mA foot electric stimulation three times a day for seven days [10].

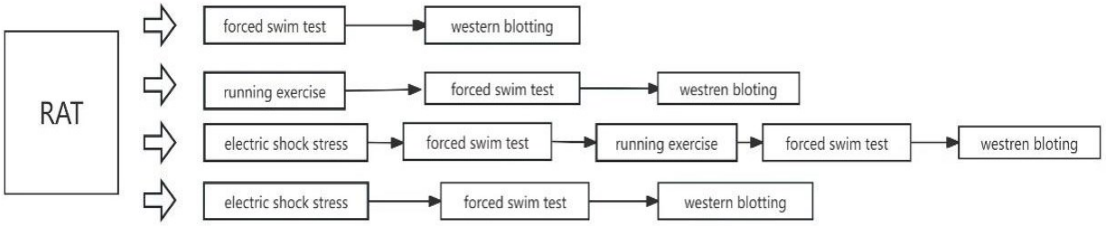


Figure 1: Flowchart of the Animal Experiment Procedure

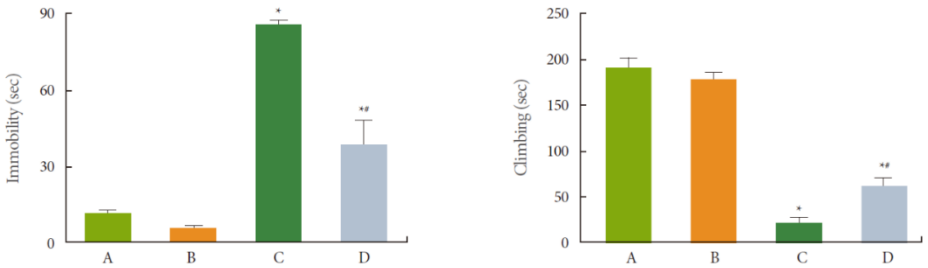


Figure 2: The Effect of Treadmill Exercise on Depressive-Like Behavior in the Forced Swimming Test. (A) Control Group, (B) Control and Exercise Groups, (C) Stress-Induced Group, (D) Stress-Induced and Exercise Groups [10].

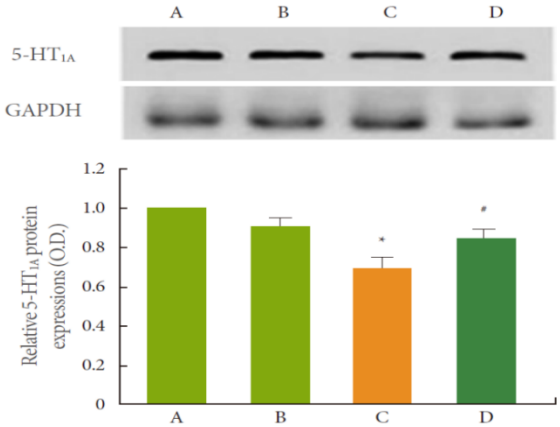


Figure 3: The Effect of Treadmill Exercise on the Expression of 5-Hydroxytryptamine 1A (5-HT1A) Receptors in the Dorsal Raphe. (A) Control Group, (B) Control and Exercise Groups, (C) Stress-Induced Group, (D) Stress-Induced and Exercise Groups [10].

DOI: 10.54254/2753-7064/40/20242193

It can be observed from Figure 2 and Figure 3 that exercise effectively alleviates anxiety and depressive symptoms in stressed rats. The immobility time caused by electric shock was reduced, while the climbing time was increased as a result of exercise.

4.2. Different Exercise Modalities Have Different Effects on the Treatment of Depression

Different types of exercise can have certain therapeutic effects on depressive mood, but they require specific conditions. Studies have shown that aerobic exercises, such as jogging, swimming, and jumping rope, can increase the levels of monoamine neurotransmitters in the brain, such as serotonin and dopamine, enhance neuronal plasticity, and thus reduce the occurrence of negative emotions. Resistance exercises improve depressive and anxious moods by regulating the gut microbiota. High-intensity interval training stimulates the body's stress response, affecting the structure of multiple brain tissues and the synthesis and release of neurotransmitters, thereby improving depressive mood [11]. Social exercises, such as team sports and cooperative games, can increase communication with others, enhance social relationships, reduce feelings of social isolation, and thus improve depressive symptoms. Nature-based exercises, such as mountain climbing, hiking, and cycling, place individuals in natural environments, providing healing and relaxation effects. These activities contribute to promoting mental health and alleviating depressive symptoms.

5. Conclusion

From these studies, it is understood that exercise can influence the treatment of depression by promoting the synthesis of serotonin. Exercise can increase the activity of the tryptophan transporter (TRYPT) in the brain, facilitating the conversion of tryptophan to serotonin, thereby increasing serotonin levels in the brain. This increase helps to stabilize mood swings and alleviate depressive symptoms. Additionally, appropriate exercise can improve the metabolic process of serotonin, promoting its normal synthesis, reuptake, and maintaining a balance of neurotransmitters, which is crucial for individuals with depression. Therefore, exercise can serve as an effective adjunctive treatment to help alleviate depressive symptoms. Moderate exercise can improve the emotional state, self-perception, and cognitive function of individuals with depression, contributing to enhanced psychological well-being.

However, many mechanisms are not yet clear, such as how exercise therapy affects the neurological mechanisms of depression, and more research is needed to address these issues. Exercise therapy, as a cost-effective treatment with minimal side effects, holds great promise for the future treatment of depression. The efficacy of exercise as an adjunctive therapy for depression may be influenced by factors such as the type, frequency, and intensity of exercise. Therefore, personalized exercise prescriptions and ongoing monitoring are significant for maximizing therapeutic outcomes, and in the future, personalized services can be developed to better treat depression. In the experiments mentioned in this paper that measure serotonin levels before and after exercise in rats, the exercise was singular, without comparison of exercise intensity. Furthermore, during the literature search, it was found that there are few clinical trials on exercise therapy, with most being animal experiments, lacking clinical trials to provide more feasibility for exercise therapy as an adjunctive treatment for depression.

References

[1] *Zhai, Y., & Li, L. (2021). The impact of exercise therapy combined with rTMS on the expression of serum neurotransmitters and cognitive function in patients with depression. [J] Journal of Henan Medical College, 33(05), 527-530.*

[2] *Li, S., Yi, X., & Cai, R. (2021). The intervention effect of exercise training on female patients with depression and its impact on serum estrogen levels. [J] Journal of Clinical and Experimental Medicine, 20(19), 2126-2129.*

[3] *Qin, X. Y., Shan, Q. H., Fang, H., Wang, Y., Chen, P., Xiong, Z. Q., Swaab, D. F., & Zhou, J. N. (2021). Upregulation of PSD-93 enhances the synaptic activity of parvocellular neurosecretory neurons containing corticotropin-releasing hormone in depression. [J] Acta Neuropathologica, 142(6), 1045-1064. doi: 10.1007/s00401-021-02371-7. Epub 2021 Sep 18. PMID: 34536123.*

[4] *Mol Psychiatry. A must-read review for depression research: Summarizing the six molecular mechanisms of depression from a synaptic perspective. http://www.medsci.cn*

[5] *Han, Y., Liu, X., Xiang, H., et al. (2020). Recent advances in clinical research on exercise therapy for depression. [J] Physical Education and Research, 35(05), 85-90. DOI: 10.16207/j.cnki.2095-235x.2020.05.016.*

[6] *Liu, H., & Luo, Q. (2024). Advances in the pathogenesis and treatment research of adolescent depression. [J] The Big Doctor, 9(03), 141-144.*

[7] *Huang, X., Wu, J., & Lin, W. (2015). Current status and prospects of serotonin research on athletes' emotions. [J] Journal of Guangzhou Sport University, 35(06), 90-93. DOI: 10.13830/j.cnki.cn44-1129/g8.2015.06.023.*

[8] *Liu, C. (2021). The regulatory mechanism of serotonin on emotional processing. University of Electronic Science and Technology. DOI: 10.27005/d.cnki.gdzku.2021.000074.*

[9] *Li, H., Wang, H., Zhao, W., et al. (2023). Advances in the inflammatory mechanism of exercise therapy for depression. Neural Disease and Mental Health, 23(07), 478-482.*

[10] *Kim, T. W., Lim, B. V., Baek, D., Ryu, D. S., & Seo, J. H. (2015). Aerobic exercise alleviates stress-induced depression by upregulating the serotonin 1A receptor in rats. [J] International Journal of Neuroscience, 19(1), 27-33. doi: 10.5213/inj.2015.19.1.27. Epub 2015 Mar 26. PMID: 25833478; PMCID: PMC4386483.*

[11] *Zhou, Y., & Ji, Z. (2023). The interventional effect of exercise on depression. [J] Contemporary Sports Science and Technology, 13(34), 189-193+198. DOI: 10.16655/j.cnki.2095-2813.2023.34.050.*

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242200

Advances in Research on the Relationship Between Social Media Use on Female's Body and Appearance Image Anxiety

Lixia Liu[1,a,*]

[1]*The University of Sheffield, Western Bank, Sheffield, UK*
a. gzliulixia22@126.com
**corresponding author*

Abstract: With the proliferation of social media platforms and new-generation aesthetics. There has been a shift in how people—especially female—view and engage with notions of the body and appearance. An increasing amount of research has examined the intricate connection between women's body and appearance issues and social media use over the last ten years. The relationship between young people's appearance anxiety issues and body image has been extensively studied in the literature. However, the influence of social media on the body image and influence of young women has received comparatively less theoretical investigation. It's also critical to comprehend how social media use influences women's body image barriers and perceptions, given the prominence of the internet in the lives of young people and their dependency on it. This essay aims to investigate the ways in which social media influences young women's body image issues and to provide a greater perspective on the research on this topic. It will do this by utilising the theories of social comparison and objectification to uncover and analyse the ways in which young women perceive their bodies and appearances on social media.

Keywords: Social Media, Body Image, Social Comparative, Self-objectification.

1. Introduction

Social media's visual format and concentration on user-generated content could reinforce society's aesthetic norms, exacerbating issues with appearance and body image. The detrimental effects of social media on female's self-perceptions can be lessened by having an understanding of the reasons behind social media use and the connections between these reasons and problems with body image. Social media is full of visual information, especially when it comes to appearance [1]. Users can comment on and like other users' photos as well as be judged and commented on by other users, giving them instantaneous and quantifiable feedback. According to Fitzsimmons-Craft et al., there is a prevalent trend among women to express dissatisfaction with their body shape and appearance, with up to 80% of them expressing this sentiment on social media [2]. Based on data from the 2020 Tiktok survey [3], among other things, "one in six women feel anxious when looking in a mirror or taking a photo, and about half of women consider themselves unattractive." Additionally, Cohen et al. discovered that young women's negative body image increased when they were exposed to celebrity photographs on Instagram more frequently [4]. This may result in heightened worry related to one's body image or, more frequently, low self-esteem and discontent among women. The difference

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242200

between one's intended and actual look is the root cause of negative body image, which can negatively affect a person's conduct and mental health.

The actual association between social media use and body image is still unclear based on the literature that is currently available. It's critical to comprehend the precise elements that could impact a person's degree of body dissatisfaction because there is a correlation between body image dissatisfaction and several detrimental outcomes, like seem anxiety. Next, using the theories of social comparison and objectification, this essay will investigate and evaluate how young women view their body and appearance anxieties on social media.

2. Social media

With users generally spending hours a day on social media reading and publishing information on their accounts, social media is quickly becoming an indispensable part of many people's everyday life. According to surveys, 3.5 billion people were using social media as of January 2019 globally [5]. According to Lenhart et al., 72% of 18 to 29 year olds in the US utilise social networking sites online and more than 80% of them use wireless Internet [6]. Pew Research Centre conducted a nationwide survey that revealed that among all demographic groups in the United States, individuals between the ages of 18 and 29 who use the internet are most likely to use social networking sites. Interestingly, women are more likely than men to browse these sites [7].

Social media is a great tool for those who are especially worried about their bodies and want to create a "virtual self-image," according to Tras et al [8]. This is due to the fact that social media allows users to make their own profiles, submit edited pictures or brief films of themselves for others to see, and browse other users' photos or videos to get a glimpse into their friends' life. Facebook, for instance, enables users to make public or semi-public profiles, personalise their pages with images and other content, alter images before posting them, and keep a close eye on how they present themselves in order to present an idealised or "wished-for" version of themselves [9,10]. Facebook has emerged as the leading social networking site (SNS) on the Internet since its debut in 2004 [11]. Facebook is the most popular social networking site in the country, used by 67% of American adults [12]. This is especially true for young people, as 90% of Americans between the ages of 18 and 29 use the site [13]. Facebook use among young women is estimated to be two hours a day [14,15].

Numerous research have looked into the connection between body image and social media use in recent years. Saiphoo and Vahedi argue that body image refers to how individuals feel, act, see, and assess their impressions of their bodies [16]. These perceptions might be good or negative. Marengo et al made the case that those who regularly use social media are more aware of or prone to concern about their looks and body image than those who do not [17]. Does social media make people feel more self-conscious about their appearance and body image, especially women? According to Bell, the crucial factor is whether or not information and images are given undue attention [18]. The longer women use social media, the more probable it is that the aesthetic standards it promotes will have an impact on them. As a result, they may unintentionally examine themselves to meet these standards, which can result in negative emotions like appearance anxiety [19].

3. Social Comparative Theory

Manago et al claim that idealised content is frequently given in the media [10]. On social media, people frequently select the most idealised aspects of their self-disclosure process to somewhat elevate their persona. According to Festinger's Social Comparison Theory, people evaluate their opinions and skills through social comparison, particularly when there are no objective criteria in place [20]. Women on social media frequently make upward comparisons between their appearance and body size and those of those who are seen as more superior, which can worsen anxiety and body

DOI: 10.54254/2753-7064/40/20242200

dissatisfaction. The majority of experimental studies in the previous social comparison research on issues related to appearance and body image have looked into how exposure to idealized bodies in traditional media (such as music videos, television, and magazines) affects young women's body dissatisfaction [21]. The main conclusion of these research is that women's body dissatisfaction is a result of the slim ideal body image that the media promotes; in other words, exposure to the media's portrayal of a thin body is linked to negative body image in women [22,23]. Conversely, the majority of experimental studies conducted recently have switched from traditional media to social media that is more engaging [24]. Eveland contends that interaction is a fundamental distinction between modern social media technologies and conventional mass media [25]. When utilising social media, users are both information providers and recipients [26]. People may become more conscious of the disparities between their ideal body and their real body through social comparisons in the virtual environment [2]. For example, a study conducted in 2015 by Fardouly et al. revealed that women who use Facebook experience greater negative body image and body image perception. And the degree of body dissatisfaction increases with the strength of the tendency to compare appearances [21,27,28]. Haferkamp et al. discovered that women expressed that their primary reason for reading other people's Facebook pages was to make comparisons with their bodies or self-images [29]. Women use social media as a platform for frequent appearance-related social comparisons. They may use it as a way to validate their self-concept by obsessively checking their profile pictures and comparing them to those of their friends who are less attractive. This process satisfies a psychological need for appearance gratification and helps them convince themselves that they look like their ideal others [30]. Consequently, examining and contrasting idealised image accounts of oneself or others on social media may worsen body image anxiety problems in women and have a detrimental effect on general wellbeing.

Furthermore, a number of research have demonstrated that the most impactful social comparisons are those made between peers [31,32]. This is founded on the original Social Comparison Theory, which contends that individuals get more reliable evaluation data when they compare themselves to friends or people who are similar to them—for example, those from similar families, social classes, or educational backgrounds [20]. In one example, it was found in a qualitative study by Kenny et al. on the impact of peers on teenagers' body image that girls are more likely to imitate their attractive peers in order to fit in [33]. The study's participants disclosed that they used social media to compare their look to that of their peers and that they mimicked the appearance of their peers in an effort to comply with certain appearance standards and guidelines unique to the peer environment. Peer pressure to maintain a close appearance may make women feel even more stressed about their bodies and expectations about how they seem. Women may internalise the attitudes and behaviours of their peers because peers tend to focus mostly on a person's unfavourable exterior qualities. This can cause emotions of confusion and worry over one's own body views and behaviours.

Because the lines between ideal and real appearances on the internet are blurring and because women in the media are portrayed as more flawless than they are in reality, ideal images in the media are frequently compared to women in real life [34]. These parallels heighten worries about how one looks on the body. Women who don't meet the unrealistic beauty standards on social media become even more unhappy and self-conscious about their bodies and appearance when they are continuously compared to other people's flawless photos.

4. Self-objectification Theory

The objectification of women is largely facilitated by the mass media [35,36]. According to the objectification theory, women are frequently socialised to accept the observer's point of view as the main one regarding their physical self. This self-perception may cause women to habitually monitor their bodies, which can put them at risk for a number of detrimental outcomes as well as raise feelings

DOI: 10.54254/2753-7064/40/20242200

of guilt and anxiety about their appearance. Regular exposure to idealised photos on social media might increase the perception that a woman's value is dependent on her looks and contribute to the objectification of women's bodies [15]. For instance, social media posts that present women's bodies as objects to be glanced at or uninvited remarks made by certain users that criticise the bodies or looks of others [37]. Women may be reminded by these remarks that they do not meet society's standards of attractiveness [38]. The objectification of women's body image can be amplified by these remarks, which can lead to women unintentionally internalising these standards and accelerating the objectification process. The majority of earlier research on social media and body image has demonstrated a connection between self-objectification and the body image that is suggested. According to Moradi and Huang, self-objectification is believed to take the form of body surveillance activities, which entail contemplating one's physical appearance to an outside observer [39].

According to objectification theory, there is a moderating effect on the relationship between self-objectification and body image concerns from factors including appearance anxiety and body image surveillance.This is supported by Seekis et al.'s study, which examined the connection between young women's use of social networking sites and their body image issues using an integrated model of objectification and social comparison theory [37]. The results of the study found a positive correlation between social appearance anxiety and body image surveillance. This also was confirmed in a study by Fardouly et al., which examined the relationship between Instagram use and young women's body image concerns and self-objectification [40]. The study's findings indicated a positive correlation between the two, which is consistent with other research suggesting that frequent exposure to social media and idealized photos on SNSs raises the risk of body surveillance and self-objectification.

In addition, user reactions—which are strongly tied to the 'like' functions of certain platforms, such Facebook and Instagram—may have an impact on how the self is presented objectifyingly on social media. Through the usage of these features, users can easily provide favourable feedback by clicking on other people's work [41]. People display themselves selectively on Facebook, for instance, sharing only the finest images of themselves. This can momentarily raise self-esteem, but it also causes a gap between a person's online and offline identities, which makes users anxious and unhappy when they believe their online persona does not match their offline one [42]. Facebook users can also be identifiable via images or related hashtags of subjects shared by others, frequently without their permission, thanks to the tagging or labelling tool. According to Fardouly et al., this may result in unwelcome exposure, which causes anxiety in women over their body image [40]. And interactive elements on Facebook give consumers measurable social recognition. Women's self-esteem and body image can be strongly impacted by the quantity of encouraging comments they receive from their networks. Nonetheless, inadequate reinforcement or unfavourable remarks can intensify anxiety related to appearance and body dissatisfaction [43]. This was supported by a study by Bell et al. that looked at the connection between the frequency of uploading sexually objectified self-images (selfies) on social media and the feedback one receives when one objectsifies oneself [44]. According to the study's findings, sharing sexually objectified photos on social media is more common the more self-objectification there is. The aforementioned findings underscore the significant role that social media plays in perpetuating negative body image and approval-seeking behaviors on the internet. Positive feedback, such as likes and comments, exacerbates anxious behaviors and feeds a vicious cycle of self-objectification and approval-seeking. These findings have important ramifications for the study and analysis of the psychological and social effects of these online activities.

5. A broader perspective: men's perceptions of social media use and body image

This essay focuses on the effects of social media on young women, however social media is a worldwide phenomenon, and its effects on body image affect many other demographics as well, including men. Males also report feeling unsatisfied with their bodies, and while there is little research

DOI: 10.54254/2753-7064/40/20242200

on how media affects male body satisfaction, some studies have found a positive correlation between using social media and both body dissatisfaction and the use of muscle-building supplements [45]. In a qualitative study conducted in 2005, Ridgeway and Tylka discovered that most of the male participants said they wanted to get more muscular in order to get the body they wanted [46]. The contemporary media standard for male attractiveness is tall, muscular, and slender. Social media has shaped these ideal bodies, making this ideal standard more and more alluring [19]. Similarly, studies have shown that men's exposure to media portrayals of muscularity may cause them to feel unsatisfied with the way their bodies look [47].

The following hypotheses can be derived from Social Comparison Theory [20]: people are more likely to compare themselves with people who are less than themselves because this serves a self-protective function; upward comparisons with people who are better than oneself in a given situation may lower self-esteem; and downward comparisons with people who are worse than oneself raise self-esteem. Women compare their own body image and appearance on social media in an upward direction, while men compare their appearance in a downward direction, more often to those who have a lower body image than to professional models [48]. In a study by Arbour and Ginnis , for instance, male participants' unhappiness with their body image increased when they saw photographs that were revealed as being excessively or visibly muscular [49].

Additionally, internalising social media ideals has been linked to men experiencing higher levels of body image dissatisfaction [50,51]. Daniel and Bridges contend that internalising media ideals is one of the most reliable indicators of the desire for muscularity [52]. As a result, upward social comparisons with muscular models or famous athletes as well as the consumption of excessively muscular images on social media can lead to a negative contrast effect and discontent, with men who are attracted to muscle being especially vulnerable [30].

6. Conclusions

It is evident that it is challenging to demonstrate a causal association between these variables in the literature review for this thesis on social media use and women's anxiety about appearance and body image. Though each of the previously stated theoretical models offers a distinct viewpoint on the reasons behind women's social media use and the effects it has on their appearance and body image, these models are not exclusive of one another. Put another way, women's perceptions of their bodies and appearance are significantly influenced by the reasons for their use of social media.

The field of study on the relationship between women's use of social media and appearance anxiety and body image is quickly developing, and it is crucial to comprehend how social media use affects body image and create practical methods for addressing associated fears. Furthermore, studies grounded in social comparison and objectification theories can shed light on the subtle ways that new media affects young women. These studies can also offer solutions for improving social media environments that support positive body image and lessen anxiety related to appearance, which can help both men and women develop healthier attitudes towards their bodies. Finally, in order to create healthier digital environments where women may connect with social media in ways that enhance rather than hinder their well-being, it is imperative that ethical standards, media literacy, and user-centered design concepts be integrated.

References

[1] *Brady, W. J., Crockett, M. J., & Van Bavel, J. J. (2020). The MAD Model of Moral Contagion: The Role of Motivation, Attention, and Design in the Spread of Moralized Content Online. Perspectives on Psychological Science, 15(4), 978–1010. https://doi.org/10.1177/1745691620917336*

[2] Fitzsimmons-Craft, E. E., Bardone-Cone, A. M., Wonderlich, S. A., Crosby, R. D., Engel, S. G., & Bulik, C. M. (2015). The Relationships Among Social Comparisons, Body Surveillance, and Body Dissatisfaction in the Natural Environment. Behavior Therapy, 46(2), 257–271. https://doi.org/10.1016/j.beth.2014.09.006
[3] Tik Tok. (2020). Research Report on FemaleExpression. Jointly published by ByteDance and China Women's Daily.
[4] Cohen, R., Newton-John, T., & Slater, A. (2017). The relationship between Facebook and Instagram appearance-focused activities and body image concerns in young women. Body Image, 23, 183–187. https://doi.org/10.1016/j.bodyim.2017.10.002
[5] Kemp, S. (2023). Digital 2023 Deep-dive: How much time do we spend on social media. Datareportal. com [online], 26.
[6] Lenhart, A., Purcell, K., Smith, A., & Zickuhr, K. (2010). Social media and young adults–Pew Internet and Life Project. Pew Research Center. Retrieved from http://www.pewinternet.org/Reports/2010/Social-media-and-young-adults
[7] Duggan, M., & Brenner, J. (2013). The demographics of social media users, 2012 (Vol. 14). Washington, DC: Pew Research Center's Internet & American Life Project.
[8] Tras, Z., Öztemel, K., & Baltacı, U. B. (2019). Role of Problematic Internet Use, Sense of Belonging and Social Appearance Anxiety in Facebook Use Intensity of University Students. International Education Studies, 12(8), 1–10. https://doi.org/10.5539/ies.v12n8p1
[9] Zhao, S., Grasmuck, S., & Martin, J. (2008). Identity construction on Facebook: Digital empowerment in anchored relationships. Computers in Human Behavior, 24(5), 1816–1836. https://doi.org/10.1016/j.chb.2008.02.012
[10] Manago, A. M., Graham, M. B., Greenfield, P. M., & Salimkhan, G. (2008). Self-presentation and gender on MySpace. Journal of Applied Developmental Psychology, 29(6), 446–458. https://doi.org/10.1016/j.appdev.2008.07.001
[11] Anderson, B., Fagan, P., Woodnutt, T., & Chamorro-Premuzic, T. (2012). Facebook Psychology: Popular Questions Answered by Research. Psychology of Popular Media Culture, 1(1), 23–37. https://doi.org/10.1037/a0026452
[12] Rainie, L., Smith, A., & Duggan, M. (2013). Coming and going on Facebook. Pew Research Center's Internet and American Life Project, 1-7.
[13] Duggan, M., Ellison, N. B., Lampe, C., Lenhart, A., & Madden, M. (2015). Social media update 2014. Pew research center, 19(1), 1-2.
[14] Fardouly, J., & Vartanian, L. R. (2015). Negative comparisons about one's appearance mediate the relationship between Facebook usage and body image concerns. Body Image, 12(1), 82–88. https://doi.org/10.1016/j.bodyim.2014.10.004
[15] Tiggemann, M., & Slater, A. (2013). NetGirls: The Internet, Facebook, and body image concern in adolescent girls. The International Journal of Eating Disorders, 46(6), 630–633. https://doi.org/10.1002/eat.22141
[16] Saiphoo, A. N., & Vahedi, Z. (2019). A meta-analytic review of the relationship between social media use and body image disturbance. Computers in Human Behavior, 101, 259–275. https://doi.org/10.1016/j.chb.2019.07.028
[17] Marengo, D., Longobardi, C., Fabris, M. A., & Settanni, M. (2018). Highly-visual social media and internalizing symptoms in adolescence: The mediating role of body image concerns. Computers in Human Behavior, 82, 63–69. https://doi.org/10.1016/j.chb.2018.01.003
[18] Bell, K. (2016). Social media and female body image.
[19] Tiggemann, M., Martins, Y., & Kirkbride, A. (2007). Oh To Be Lean and Muscular: Body Image Ideals in Gay and Heterosexual Men. Psychology of Men & Masculinity, 8(1), 15–24. https://doi.org/10.1037/1524-9220.8.1.15
[20] Festinger, L. (1954). A Theory of Social Comparison Processes. Human Relations (New York), 7(2), 117–140. https://doi.org/10.1177/001872675400700202
[21] Myers, T. A., & Crowther, J. H. (2009). Social Comparison as a Predictor of Body Dissatisfaction: A Meta-Analytic Review. Journal of Abnormal Psychology (1965), 118(4), 683–698. https://doi.org/10.1037/a0016763
[22] Groesz, L. M., Levine, M. P., & Murnen, S. K. (2002). The effect of experimental presentation of thin media images on body satisfaction: A meta-analytic review. The International Journal of Eating Disorders, 31(1), 1–16. https://doi.org/10.1002/eat.10005
[23] Grabe, S., Ward, L. M., & Hyde, J. S. (2008). The Role of the Media in Body Image Concerns Among Women: A Meta-Analysis of Experimental and Correlational Studies. Psychological Bulletin, 134(3), 460–476. https://doi.org/10.1037/0033-2909.134.3.460
[24] Kane, G. C., Alavi, M., Labianca, G., & Borgatti, S. P. (2014). What'S Different About Social Media Networks? A Framework and Research Agenda. MIS Quarterly, 38(1), 275–304. https://doi.org/10.25300/MISQ/2014/38.1.13
[25] Eveland Jr, W. P. (2003). A "Mix of Attributes" Approach to the Study of Media Effects and New Communication Technologies. Journal of Communication, 53(3), 395–410. https://doi.org/10.1111/j.1460-2466.2003.tb02598.x
[26] Sundar, S. S., Oh, J., Kang, H., & Sreenivasan, A. (2013). How does technology persuade? Theoretical mechanisms for persuasive technologies.

[27] Van den Berg, P., Thompson, J. K., Obremski-Brandon, K., & Coovert, M. (2002). The Tripartite Influence model of body image and eating disturbance: A covariance structure modeling investigation testing the mediational role of appearance comparison. Journal of Psychosomatic Research, 53(5), 1007–1020. https://doi.org/10.1016/S0022-3999(02)00499-3

[28] Vartanian, L. R., & Dey, S. (2013). Self-concept clarity, thin-ideal internalization, and appearance-related social comparison as predictors of body dissatisfaction. Body Image, 10(4), 495–500. https://doi.org/10.1016/j.bodyim.2013.05.004

[29] Haferkamp, N., Eimler, S. C., Papadakis, A. M., & Kruck, J. V. (2012). Men are from mars, women are from venus? Examining gender differences in self-presentation on social networking sites. Cyberpsychology, Behavior and Social Networking, 15(2), 91–98. https://doi.org/10.1089/cyber.2011.0151

[30] Perloff, R. M. (2014). Social Media Effects on Young Women's Body Image Concerns: Theoretical Perspectives and an Agenda for Research. Sex Roles, 71(11-12), 363–377. https://doi.org/10.1007/s11199-014-0384-6

[31] Heinberg, L. J., & Thompson, J. K. (1992). Social comparison: Gender, target importance ratings, and relation to body image disturbance. Journal of Social Behavior and Personality, 7(2), 335. https://www.proquest.com/scholarly-journals/social-comparison-gender-target-importance/docview/1292279024/se-2

[32] Schutz, H. K., Paxton, S. J., & Wertheim, E. H. (2002). Investigation of Body Comparison Among Adolescent Girls1. Journal of Applied Social Psychology, 32(9), 1906–1937. https://doi.org/10.1111/j.1559-1816.2002.tb00264.x

[33] Kenny, U., O'Malley-Keighran, M.-P., Molcho, M., & Kelly, C. (2017). Peer Influences on Adolescent Body Image: Friends or Foes? Journal of Adolescent Research, 32(6), 768–799. https://doi.org/10.1177/0743558416665478

[34] Zhong, Y. (2022). THE INFLUENCE OF SOCIAL MEDIA ON BODY IMAGE DISTURBANCE INDUCED BY APPEARANCE ANXIETY IN FEMALE COLLEGE STUDENTS. Psychiatria Danubina, 34(suppl 2), S638–S644. ZAGREB: Medicinska Naklada.

[35] Aubrey, J. S., & Frisby, C. M. (2011). Sexual Objectification in Music Videos: A Content Analysis Comparing Gender and Genre. Mass Communication & Society, 14(4), 475–501. https://doi.org/10.1080/15205436.2010.513468

[36] Fredrickson, B. L., & Roberts, T.-A. (1997). Objectification Theory: Toward Understanding Women's Lived Experiences and Mental Health Risks. Psychology of Women Quarterly, 21(2), 173–206. https://doi.org/10.1111/j.1471-6402.1997.tb00108.x

[37] Seekis, V., Bradley, G. L., & Duffy, A. L. (2020). Appearance-Related Social Networking Sites and Body Image in Young Women: Testing an Objectification-Social Comparison Model. Psychology of Women Quarterly, 44(3), 377–392. https://doi.org/10.1177/0361684320920826

[38] Tylka, T. L., & Sabik, N. J. (2010). Integrating Social Comparison Theory and Self-Esteem within Objectification Theory to Predict Women's Disordered Eating. Sex Roles, 63(1-2), 18–31. https://doi.org/10.1007/s11199-010-9785-3

[39] Moradi, B., & Huang, Y.-P. (2008). Objectification Theory and Psychology of Women: A Decade of Advances and Future Directions. Psychology of Women Quarterly, 32(4), 377–398. https://doi.org/10.1111/j.1471-6402.2008.00452.x

[40] Fardouly, J., Willburger, B. K., & Vartanian, L. R. (2018). Instagram use and young women's body image concerns and self-objectification: Testing mediational pathways. New Media & Society, 20(4), 1380–1395. https://doi.org/10.1177/1461444817694499

[41] Sherman, L. E., Payton, A. A., Hernandez, L. M., Greenfield, P. M., & Dapretto, M. (2016). The Power of the Like in Adolescence: Effects of Peer Influence on Neural and Behavioral Responses to Social Media. Psychological Science, 27(7), 1027–1035. https://doi.org/10.1177/0956797616645673

[42] Meier, E. P., & Gray, J. (2014). Facebook photo activity associated with body image disturbance in adolescent girls. Cyberpsychology, Behavior and Social Networking, 17(4), 199–206. https://doi.org/10.1089/cyber.2013.0305

[43] Vogel, E. A., Rose, J. P., Roberts, L. R., & Eckles, K. (2014). Social Comparison, Social Media, and Self-Esteem. Psychology of Popular Media Culture, 3(4), 206–222. https://doi.org/10.1037/ppm0000047

[44] Bell, B. T., Cassarly, J. A., & Dunbar, L. (2018). Selfie-Objectification: Self-Objectification and Positive Feedback ("Likes") are Associated with Frequency of Posting Sexually Objectifying Self-Images on Social Media. Body Image, 26, 83–89. https://doi.org/10.1016/j.bodyim.2018.06.005

[45] Levine, M. P., & Chapman, K. (2011). Media influences on body image.

[46] Ridgeway, R. T., & Tylka, T. L. (2005). College Men's Perceptions of Ideal Body Composition and Shape. Psychology of Men & Masculinity, 6(3), 209–220. https://doi.org/10.1037/1524-9220.6.3.209

[47] Galioto, R., & Crowther, J. H. (2013). The effects of exposure to slender and muscular images on male body dissatisfaction. Body Image, 10(4), 566–573. https://doi.org/10.1016/j.bodyim.2013.07.009

[48] *Strahan, E. J., Wilson, A. E., Cressman, K. E., & Buote, V. M. (2006). Comparing to perfection: How cultural norms for appearance affect social comparisons and self-image. Body Image, 3(3), 211–227. https://doi.org/10.1016/j.bodyim.2006.07.004*

[49] *Arbour, K. P., & Martin Ginis, K. A. (2006). Effects of exposure to muscular and hypermuscular media images on young men's muscularity dissatisfaction and body dissatisfaction. Body Image, 3(2), 153–161. https://doi.org/10.1016/j.bodyim.2006.03.004*

[50] *Grammas, D. L., & Schwartz, J. P. (2009). Internalization of messages from society and perfectionism as predictors of male body image. Body Image, 6(1), 31–36. https://doi.org/10.1016/j.bodyim.2008.10.002*

[51] *Karazsia, B. T., & Crowther, J. H. (2010). Sociocultural and Psychological Links to Men's Engagement in Risky Body Change Behaviors. Sex Roles, 63(9-10), 747–756. https://doi.org/10.1007/s11199-010-9802-6*

[52] *Daniel, S., & Bridges, S. K. (2010). The drive for muscularity in men: Media influences and objectification theory. Body Image, 7(1), 32–38. https://doi.org/10.1016/j.bodyim.2009.08.003*

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242194

A Mirror for Men? Feminist Activism of #ImitatingGreasyMen in China

Yaqi Liu[1,a,*]

[1]*School of Communication, Emerson College, 120 Boylston Street, Boston, MA 02116, US*
a. yaqiliu2024@gmail.com
**corresponding author*

Abstract: With the evolution of social media, video-sharing platforms have emerged as new arenas for feminist activism. This article examines a new form of hashtag activism on Douyin (Chinese version of TikTok), where Chinese female vloggers satirically imitate certain male behaviors that are sexual aggressive to women. The term sexual aggression is used inclusively to indicate a continuum of manifestations of unwanted sexual behaviors that cover all acts of unwanted sexual contact from sexual harassment up to and including rape. Based on Critical Discourse Analysis (CDA) of the top 20 most-viewed short videos tagged with #ImitatingGreasyMen, this study identifies two prevalent imitation archetypes: "Mansplainer" and "Ordinary-But-Confident Men.", emphasizing the importance of social media platforms for women's expression of attitudes toward gender inequality using humorous language and gestures. Women can use social media platforms to mimic certain typical male behaviors through humorous language and actions in order to awaken women and stay tuned in society. The findings demonstrate a growing level of awareness and resistance to male chauvinist and patriarchal norms, suggesting a shift in traditionally male-dominated gender dynamics and the power of digital activism in challenging traditional gender norms and advancing feminist discourse in China's digital landscape.

Keywords: social media platform, sexual aggression behavior imitation, Critical Discourse Analysis(CDA), digital activism.

1. Introduction

In March 2023, a female vlogger named @fangtouming posted a series of iconic videos on Douyin (the Chinese version of TikTok) posted a series of iconic videos in which she mimicked the characteristic gestures of a "Greasy Men," such as giggling, eyebrow-raising, lip-biting, and prolonged staring. Rapidly gaining popularity on Douyin, these videos subsequently inspired numerous female vloggers to craft similar parody videos, dressed in masculine outfits and satirically mimicking various aspects of either the typical portrayal of masculine figures daily or behaviors deemed to be offensive or aggressive towards women, such as overconfidence, mansplaining, mouthiness, and an inappropriate sense of entitlement.

As an increasing number of female vloggers joined this online movement, the imitation diversified, including portrayals of greasy men of different ages, professions, and regions. Women also created a variety of hashtags to connect their video posts. Two of the primary hashtags, #ImitatingGreasyMen (#油男模仿秀#) and #GreasyMen(#油腻男#), had garnered 1.59 billion and 150 million views,

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242194

respectively, by October 10, 2023. These videos resonated with many female users, as evidenced by the plethora of comments, some of which notably stated, "In this video, I see thousands of men," or "I wish all men would understand that 99.9% of women have experienced this kind of disgusting gaze, and the remaining 0.1% just haven't noticed it" [1].

Originating from Weibo, the buzzword "greasy men" was initially coined to depict middle-aged men known for their lack of attention to personal fitness, unkempt appearance, and crude manner. This term gained popularity because of the viral article "How to Avoid Becoming a Greasy Middle-Aged Man" written by a Chinese writer named Feng Tang[2], sparking various discussions about masculinities and becoming one of the hottest topics towards the 2017 end, which demonstrates its social impact and discursive power. However, when feminist vloggers appropriated this term, they imbued it with new meanings, transforming it into an umbrella term encompassing a spectrum of harmful aspects of masculinity as observed and experienced uncomfortably by women from their perspective. In this context, the gender-reversal performance of #ImitatingGreasyMen signifies a unique wave of feminist activism. It aligns with the global trend of hashtag feminism used to critique the everyday manifestations of toxic masculinity and to protest against gender inequality, as in the case of the #MasculinitySoFragile on Twitter [3].

Despite the significant attention and discussion these videos have garnered on social media, there needs to be more scholarly inquiry into their more profound socio-cultural implications, for example, female gaze, a term that is used as a specific lens through which a woman views, influenced by the women creators whose eyes the audience is looking through [4]. Besides, Chinese households have traditionally practiced the patrilineal system, giving males precedence in a family [5]. In this system, the whole society will undoubtedly support the perspective of gender inequality that restricts women in domestic matters. Alongside the observable national sex ratio imbalance, Chinese women's hardship in personal life is generally overlooked. Thus, there emerged more female bloggers and vloggers creating articles or videos showing their opinions or observations on male superiority through social media in China.

Therefore, the paper will explore how the female gazes are demonstrated in the vloggers created by the chosen vloggers, imitating the typical patterns of Greasy Men in their videos. The purpose of this paper is to arouse the cognition of society against social-cultural unfairness and call on women to be aware of and get rid of the gender gazes around them. Accordingly, Critical Discourse Analysis (CDA) was employed to examine the Top 20 most-viewed videos tagged with #ImitatingGreasyMen, the most-viewed hashtag in the video in order to identify two typical greasy men images and to discuss the contribution of activism expressing women's discontent with their daily struggles with gender inequalities and for the reshaping of public discourse on gender. Research questions are as follows: (1) What do women imitate the typical patterns of greasy-men masculinities in their videos? (2) What commonalities exist in the discourse of #ImitatingGreasyMen? (3) What socio-cultural factors impact women's imitation?

2. Literature Review

2.1. Feminist activism in digital China

The advent of social media has significantly expanded the scope of feminist activism. It provides women abundant avenues to "voice" their perspectives and diversifies the range of voices participating in these discussions. Leveraging the culture of calling out on social media, women have been vocalizing and challenging everyday sexism, misogyny, and sexual violence, which has increased the visibility of gender politics, heralding the arrival of what is termed "Fourth-wave Feminism" [6][7]. The "Fourth wave" of feminism is characterized primarily by digital activism and is marked by features such as "collective voicing, global participation, and a focus on

DOI: 10.54254/2753-7064/40/20242194

intersectionality" [8]. A quintessential example of this wave is "The Everyday Sexism Project," initiated in 2012 by British feminist writer Laura Bates on her blog. She encouraged women to share their experiences of gender discrimination. The initiative spread to 18 countries and received tens of thousands of responses from women of diverse skin colors, ages, religions, social classes, and professions within less than a year, which surpassed her expectations. These women shared their experiences of gender discrimination in homes, schools, workplaces, public spaces, and mass media [9]. By the end of 2017, the globally sweeping #MeToo movement became one of the most influential feminist discursive actions in recent years, highlighting the powerful mobilizing capacity of the hashtag.

Hashtags serve many functions, signaling topics, connecting personal posts, encouraging participation, and aggregating information under a unified theme. This aggregation enhances the efficiency of information dissemination and organization, enabling users who do not follow each other to form a community akin to shared interests and opinions [10]. By inserting personal posts into hashtag threads, individual women's voices coalesce into a collective voice articulating everyday demands, creating a safe space for women to disclose grievances and resistance[11]. This hashtag-enabled feminist expression is therefore conceptualized as "hashtag feminism," which contributes to feminist consciousness-raising[12], facilitating feminist solidarity [13], and representing a potent strategy for resisting gender inequality[12].

Aligning with the worldwide wave of hashtag feminism, a rising trend in China is that women mobilize hashtags to combat gender discrimination, expose sexual harassment, and protest against menstrual shame [14]. For example, hashtags such as #Anti-appearanceAnxiety and #RejectingAppearanceAnxiety have been used millions of times, marking a feminist response to the destructive impact of aesthetic norms that have long dominated the beauty standard of women's appearance [15]. Moreover, the #MeToo movement initiated collaboratively on various Chinese social media platforms has united survivors, activists, and the public, raising awareness and discussions about sexual harassment and assault throughout society [16][17].

However, like other digital activism and collective actions, Chinese feminist activism suffers from censorship and political oppression[18]. Some feminist social media accounts were permanently banned for "violating relevant national policies and regulations" [19][20]. While it is challenging to confirm whether these accounts closed due to advocating for "MeToo," their steadfast stance against patriarchy and support for feminist actions made them more susceptible to government monitoring and scrutiny. Therefore, scholars underscore the challenges faced by online feminist activists, particularly in the wake of stringent online monitoring [21]. These challenges have led to the evolution of a resilient and adaptive feminist community that employs creative strategies to voice dissent and share stories[22]. Using puns, homonyms, and innovative hashtags becomes a tool for activism and a necessity for survival in the digital realm [23].

2.2. Female gaze and social media

The concept of the female gaze emerges as a profound counter-narrative to the entrenched traditional male gaze, creating a discourse of resistance and rebellion that transcends the conventional frameworks of objectification and sexualization[24]. This notion does not merely act as an oppositional force; it embodies a reclamation of narrative power, challenging the traditional gender norms and expectations that have long dominated the societal gaze[25] . The essence of the female gaze is further enriched by the embodied experiences of women, who navigate the complex terrains of 'the gaze' in their daily interactions[26]. The scrutiny of these embodied experiences, particularly the reactions and responses of women when subjected to the gaze, primarily from male counterparts, unveils the underlying power dynamics and gendered narratives [27]. It serves as a lens through which

DOI: 10.54254/2753-7064/40/20242194

the intricacies of gendered interactions are explored, shedding light on the female gaze as a form of resistance[28].

Furthermore, the female gaze epitomizes an expression of agency, where women transcend the roles of mere spectators or subjects, evolving into characters or creators with the autonomy to articulate their perspectives and experiences. This expression challenges the traditional gender roles and expectations, heralding a shift towards a more nuanced understanding of gender dynamics[24]. The richness of the female gaze is further encapsulated in its contextual and pluralistic interpretations. Recognizing the female gaze as a plural concept accentuates each individual's unique gaze, which is intricately shaped by personal experiences and social contexts[29]. This pluralism acknowledges the diversity of women's experiences. It underscores the potential of the female gaze as a medium to reflect a vast spectrum of gender-based dissidents and expressions of resistance[30]. This comprehensive understanding of the female gaze contributes to a broader dialogue within feminist and gender studies, propelling a more inclusive and equitable discourse on gender and sexuality.

2.3. Chinese manhood and masculinity

The temperament of Chinese men has always been subject to societal expectations and the influence of globalization, characterized by complexity and diversity. The traditional Chinese concept of masculinity revolves around the dual ideals of "wen" (cultural attainment) and "wu" (physical ability) [31]. More specifically, the Chinese notion of masculinity emphasizes cultural refinement and intelligence over physical strength [32]. At the same time, with the influence of Westernization and modernization, Chinese masculinity has also undergone significant changes [31]. The mutual influence of the Chinese and American film industries has led to changes in the portrayal of men in Chinese mass media, reflecting a more globalized, hybrid masculine ideal[33][34][35]. while the export of popular culture from Japan and Korea has reinforced expectations for men to be gentle, delicate, and emotionally rich, further promoting a "feminization" of the male image [36]. It is evident, therefore, that Chinese masculinity is not a monolithic entity but a diversified form and practice under historical, social, and cultural conditions, constantly adapting to a changing environment. However, these changes are often adjusted to maintain male dominance over women and elite men's dominance over other men[37].

At the same time, in contemporary Chinese society, the construction of the ideal male image is also influenced by neoliberal feminism[38]. Neoliberal feminism advocates for interdependent gender relations and requires men to accept a degree of domestication to accommodate women's needs for balancing family and work[39][40]. However, this idealized feminized Chinese male is still imagined as a wealthy man, containing male power elements [41]. It also emphasizes men's capacity to be attentive to women's needs, therefore fundamentally following a patriarchal logic[41]. The transformative role of female consumer power in shaping the entertainment industry's portrayal of male masculinity in China has also garnered considerable scholarly attention. For instance, Song et al. [41] provide insights into the popularity of "little fresh meat," reflecting a broader social trend that favors a youthful appearance and softer masculinity among Chinese women. These characters often embody an idealized version of masculinity that appeals to a segment of the female audience looking for both escapism and empowerment[42][43].

It should be noted that early research on "masculinity" was primarily focused on white, Western societies, with non-Western societies and cultures often marginalized or overlooked. Although studies on Chinese masculinity have made certain advancements, the impetus for research on Chinese masculinity has also mainly come from Asian populations seeking recognition in Western countries rather than from concepts and practices within Asian societies themselves. This research tendency has led to a deficiency in the study of the conceptions and practices of masculinity within China and other Asian societies, leaving a significant academic void in this field. This study, by focusing on

DOI: 10.54254/2753-7064/40/20242194

gender performance within Chinese society—especially gender narratives in the new media environment—provides a new perspective for understanding Chinese masculinity. Moreover, by analyzing the dissemination of the hashtag #ImitatingGreasyMen, this research reveals the fluidity and diversity of gender roles, challenging traditional gender notions and definitions of masculinity, and offers important insights into the gender cognition and expression of the younger generation. Therefore, this study not only enriches the academic discourse on Chinese masculinity but also presents new ideas and methods for promoting gender equality and the diversification of gender perception.

3. Research Methods

This research employs Critical Discourse Analysis (CDA) to examine the phenomenon of women imitating "greasy men" on Douyin, mainly focusing on videos under the hashtag #ImitatingGreasyMen. The choice of CDA, as advocated by scholars like Fairclough [44] and Van Dijk[45], is driven by its efficacy in exploring the interconnections between discourse, power, and social relations, making it particularly suitable for analyzing media representations about gender. The data collection process for this research is rooted in a purposive sampling strategy, aligning with qualitative research methodologies that emphasize the relevance and insight potential of the data sources. The corpus comprises the top twenty most-viewed videos under the hashtag #ImitatingGreasyMen on Douyin as of October 10, 2023. Selecting the most-viewed videos serves a dual purpose. Firstly, it allows the study to engage with content that has a substantial impact and visibility within the digital sphere, thus capturing a significant portion of the relevant discourse. Secondly, the popularity of these videos suggests that they indicate the salient features and common patterns in the representation of "greasy men" resonating with women users, therefore allowing for an in-depth interpretation of the key trends and characteristics of the studied phenomenon.

The analysis of the videos is structured around Fairclough's three-dimensional framework, which includes the analysis of text, discursive practice, and sociocultural practice. Hence, the whole analytical process can be divided into three phases. The first phase involves a detailed examination of the actual content of the videos, including linguistic features (spoken words, tone, style), non-linguistic elements (visual imagery, body language, gestures), and the overall structure and format of the videos. This phase aims to identify and describe how women portray "greasy men" in these videos. The second phase delves into the interpretative aspects of the videos. This phase critically examines the portrayals' underlying power relations and gendered discourses. It explores how these imitations of "greasy men" interact with established norms and narratives around masculinity, seeking to uncover these representations' deeper meanings and implications. The third phase extends the analysis to the broader sociocultural and ideological contexts. This phase examines the wider societal, cultural, and ideological factors that influence and are influenced by the representations in the videos. It involves exploring themes of gender norms, societal perceptions of masculinity, and the role of digital media in shaping and reflecting public discourse. This stage is crucial for situating the findings within the larger landscape of gender dynamics and digital culture, particularly in the Chinese context.

4. Findings

The analysis of the top twenty most-viewed videos under the hashtag #ImitatingGreasyMen on Douyin revealed two predominant types of “greasy men” being satirically imitated by female vloggers, namely “mansplainer” and “ordinary-but-confident man.”

DOI: 10.54254/2753-7064/40/20242194

4.1. Mansplainer

A "mansplainer" (dieweinan, 爹味男) has emerged as a term to denote a self-assumed superior communication style characterized by a patronizing lecture tone and disregard for the perspectives of others, especially women or younger individuals. This particular mode of communication often manifests as a patronizing lecture tone, where the "mansplainer" tends to offer self-centered views and advice, disregarding the perceptions and needs of others, thus exerting a sense of oppression on the other party in the conversation. This term is similar to mansplaining, which connotes a critique of male condescension. In part of the studied sample, female content creators have satirically imitated the demeanor and behavioral patterns of "mansplainer."

They typically don a specific attire, including gold-rimmed glasses and suit trousers, accessorized with luxury items, to depict a "successful middle-aged man." They also mobilize certain mannerisms and catchphrases to highlight their condescending and preachy attitudes and behaviors. Simultaneously, the impersonators extensively use the short video format and the capabilities of the Douyin platform, using editing techniques, music, filters, and special effects to enhance the image of the "mansplainer further." For instance, they might use rapid cuts or zoom to intensify the "mansplainer's" unsettling gestures or expressions, employ humorous background music to underscore the comic effect of the imitation or use filters and special effects to exaggerate certain features or create an ironic atmosphere. One Douyin creator, "Zhou Yingjun," gained popularity for accurately imitating these behaviors, reflecting on the societal expectations of male roles. Often associated with age and experience, these roles are perceived as social capital, fostering a patronizing attitude in men towards women. While ostensibly benevolent, this didacticism conceals underlying intentions of authority and control.

The imitation of "mansplainer" represents a reenactment and satire of traditional gender roles and power structures in China. In patriarchal culture, men are typically expected to play the roles of protectors and providers, and these roles are often associated with increased age, experience, and social status. The "father/dad" role is often an individual's initial encounter with a male authority figure, substantially shaping their early perception of male authority. The term "mansplain" embodies such long-standing societal conditioning, inversely validating the sustained recognition and expectation of the male role, particularly its authoritative nature within the family unit. Men often assume a dominant and authoritative stance, while women tend to conform and remain silent because their contributions are usually dismissed with a polite yet perfunctory laugh. American public writer Rebecca Solnit analyzes the etiology of the "silent woman" phenomenonin her book "Men Explain Things to Me" [46]. She posits that women's silence is not an active choice but a forced suppression. "Men explain things to me and other women, regardless of whether they know what they're talking about," Solnit writes. She likens this patronizing discourse to street harassment, insinuating to women that "this is not their world," thus enforcing their silence. It trains females in self-doubt and self-limitation while nurturing unfounded overconfidence in men. Under a series of complex mechanisms, certain men naturally regard themselves as superior, further entrenching the notion that "she has to learn something from me" as their central theme of communication.

Therefore, women's mockery of mansplaining is a sharp counterattack against patriarchy, cleverly unveiling the hypocrisy of masculine pretense—that behind its seemingly robust exterior lies emptiness, without any more excellent knowledge or ability than women to substantiate it. This confidence has been tolerated because it is built upon societal prejudice. In other words, the satirical imitation of the "mansplainer" by women on platforms like Douyin can be seen as a counterattack against this patriarchal norm, exposing the hollow arrogance behind the façade of masculine confidence. The satirical imitation also reflects women's longing for equality, respect, and diverse interactions and a rejection of any form of unilateral control and oppression.

DOI: 10.54254/2753-7064/40/20242194



Figure 1: Screenshots of videos featuring women's imitation of mansplainer

4.2. Ordinary-But-Confident Man

The term “ordinary-but-confident man” was first coined in August 2020 by female stand-up comedian Yang Li, who questioned, “Why are men obviously ordinary but so confident?”This query sparked heated debate among netizens immediately after the show was broadcast, maintaining a high level of controversy. Typically, an “ordinary-but-confident man” refers to men who harbor an inflated self-assessment and exhibit excessive self-confidence despite being average in appearance, income, conversational ability, and cultivation. This archetype is often tied to a toxic male mindset that interprets any action by women around them as an attempt to garner their attention.

In the analyzed Douyin videos, the “ordinary-but-confident man” emerges as a distinctive archetype. As portrayed by female vloggers, this persona often exhibits traits that reflect a deep-seated belief in their superiority, regardless of their actual abilities or achievements. Compared to videos that mimic “mansplainer,” which focuses on the accuracy of attire, the imitation of an “ordinary-but-confident man” emphasizes speech patterns and attitudes. These men are often depicted misinterpreting interactions with women, reading women’s normal behavior as flirtation or rejection as playing hard to get. Common phrases in these imitations include, “Girl, you’re playing hard to get,” “Women always say one thing and mean another,” and “Woman, you have successfully got my attention.” Interestingly, when female Douyin users mimic “ordinary-but-confident man,” they do not emphasize a specific age range. Comparatively, “mansplainer” is often associated with the characteristics of men in particular age groups or stages of life, whereas“ordinary-but-confident man” represents a more general, age-inclusive expectation of males, which highlights the ubiquity of male confidence across all ages.

DOI: 10.54254/2753-7064/40/20242194

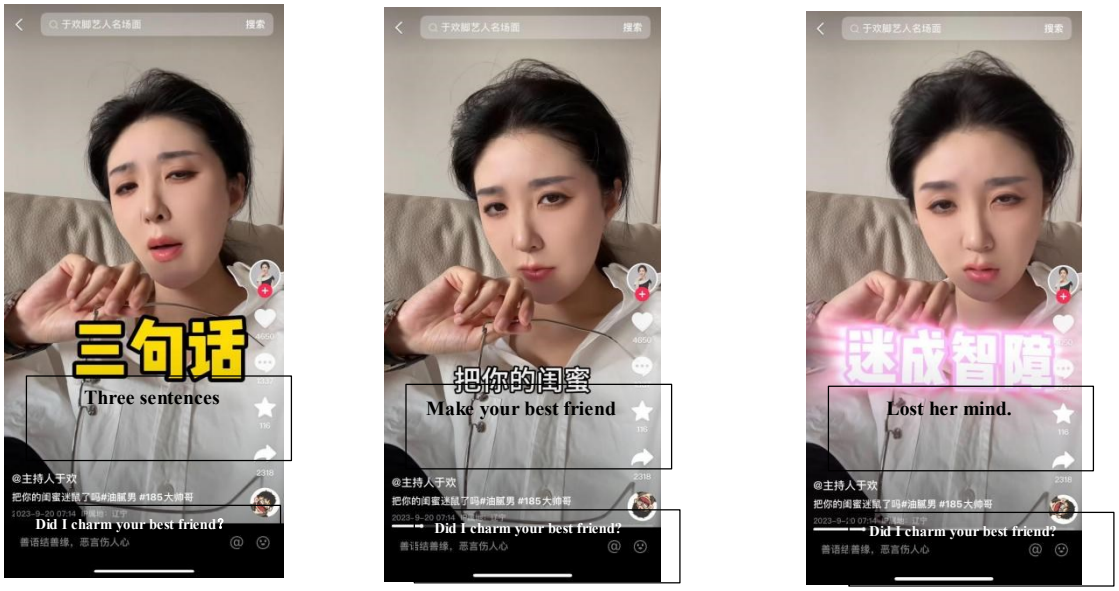


Figure 2: Screenshots of videos featuring women's imitation of ordinary-but-confident man

The phenomenon of men's ordinary yet confident demeanor originates from long-standing sociocultural constructs and gender role expectations. Traditional concepts of male superiority give men an inherent basis for confidence independent of external achievements (a form of phallocentrism). Concurrently, the various acquired privileges men enjoy in modern society further reinforce this confidence, allowing men to maintain self-assuredness even without notable competencies, educational qualifications, or emotional intelligence, even though their confidence may primarily rely on their gender advantage. Women, on the other hand, due to historical oppression and gender discrimination, face more significant social and psychological pressures invisibly exact a stricter criterion on their self-assessment of excellence, thereby affecting their confidence. This culturally embedded rigid self-assessment continues to propel men into a cycle of self-satisfaction and excessive confidence.

In this context, women's satirical imitation of "ordinary-but-confident man" underscores significant sociocultural implications, particularly in evolving gender dynamics and media representation. This trend represents a form of digital activism where humor and mimicry serve as tools for social commentary, challenging traditional gender roles and stereotypes prevalent in Chinese society. By exaggerating the traits of an "ordinary-but-confident man," these imitations highlight the subtle yet pervasive forms of masculine arrogance often normalized in social interactions. This portrayal reflects a growing awareness and critique of toxic masculinity. It challenges the cultural acceptance of male arrogance as a normative trait, questioning why society often equates male confidence with superiority, irrespective of actual merit. In a culture where traditional gender roles have historically placed men in positions of power and authority, these imitations by women serve as a counter-narrative, highlighting the absurdity and unfairness of these unearned privileges.

Furthermore, the imitation exemplifies that social media can be a powerful medium for feminist expression, enabling women to collectively ridicule and undermine the unwarranted confidence of men, thereby subverting traditional power dynamics. This act of mimicry is not just a form of entertainment; it is a statement against the entrenched patriarchal values that have long dictated gender relations in China. In essence, the imitation of "ordinary-but-confident man" by women on Douyin is more than mere imitation; it is a nuanced form of social critique and a manifestation of the changing landscape of gender relations in the digital era. Through these portrayals, women are

DOI: 10.54254/2753-7064/40/20242194

reclaiming agency in defining masculinity and reshaping public discourse on gender roles, signaling a transformative era in gender politics.

5. Conclusion

This study uses CDA as the analytical tool and focuses on the intriguing phenomenon of women imitating "greasy men" on Douyin, identifies and analyses two prevalent masculine archetypes: the "mansplainer" and the "ordinary-but-confident man." The primary results are as follows. These archetypes, satirically portrayed by female vloggers, offer a critical lens through which we can view the evolving dynamics of gender relations and the power of digital media as a platform for feminist expression. The "mansplainer," characterized by a patronizing and authoritative demeanor, reflects the entrenched patriarchal structures in Chinese society. Firstly, These imitations reveal a resistance to the authoritative male figure that has dominated the social and familial landscape. Similarly, the "ordinary-but-confident man" archetype captures the pervasive yet often overlooked aspects of toxic masculinity. These imitations highlight the absurdity of unearned male confidence and entitlement, questioning the societal norms that equate Secondly, The popularity and impact of these videos on Douyin also signify a more significant cultural shift. They reflect a growing consciousness among women about the societal constructs that have long undermined their agency. By engaging in this form of mimicry, women assert their voices and reshape the discourse on gender equality. These digital expressions are a powerful tool for feminist activism, allowing women to collectively ridicule and undermine the traditional power dynamics that have favored men. Thirdly, plenty of young females awareness of gender gaze, especially female gaze, indicates that female are tending to choose to self-gaze under the guidance of society or the content from social media, initiating a kind of female gaze that integrates self-exploration and self-empowerment. In the future, with the digital feminism development in China, the study will continue to explore how female activism use social media as a platform for the achievement of Chinese gender equality and for a voice for themselves from both positive and negative sides.

However, it is crucial to recognize that men, too, are victims of societal gender expectations. The male traits that are imitated and mocked are, in fact, reflections of the stereotypical expectations imposed by patriarchy on men. Attacks on the opposite gender group do not facilitate the improvement of the already fractured gender issue and are counterproductive to dismantling the schemes of patriarchy. Instead, such attacks may obscure the necessary collective reflection on this overall predicament. Therefore, on the journey towards gender equality, fostering understanding and dialogue between men and women is essential, rather than merely deepening the divide through imitation and satire. Actual progress in gender equality and social justice can only be achieved when society as a whole reflects and works together to dismantle the patriarchal constraints imposed on all genders.

References

[1] *https://www.huxiu.com/article/1591036.html https://www.huxiu.com/article/219886.html.*
[2] *https://weibo.com/ttarticle/x/m/show#/id=2309404167335584902428&_wb_client_=1*
[3] *Banet-Weiser, S., & Miltner, K. M. (2016). # MasculinitySoFragile: Culture, structure, and networked misogyny. Feminist media studies, 16(1), 171-174.*
[4] *Mulvey, L. (1975). Visual Pleasure and Narrative Cinema. Screen, 16, 6-18.http://dx.doi.org/10.1093/screen/16.3.6*
[5] *Song, Z. (2008). Flow into eternity: Patriarchy, marriage and socialism in a north China village. University of Southern California.*
[6] *Munro, E. (2013).“ Feminism: A fourth wave?”. Political insight, 4(2), 22-25.*
[7] *Chamberlain, P. (2017). The feminist fourth wave: affective temporality. Gewerbestrasse, Switzerland: Springer International Publishing.*

DOI: 10.54254/2753-7064/40/20242194

[8] Retallack, H., Ringrose, J., and Lawrence, E. (2016).Fuck your body image: Twitter and instagram feminism in and around school. In J. Coffey, S. Budgeon, and H. Cahill Eds, Learning bodies. Singapore: Springer,85–103.
[9] Bates, L. (2014). Everyday sexism. London,UK: Simon and Schuster.
[10] Shao, Y., Desmarais, F., & Kay Weaver, C. (2014). Chinese advertising practitioners' conceptualisation of gender representation. International Journal of Advertising, 33(2), 329-350.
[11] Dixon, K. (2014). Feminist online identity: Analyzing the presence of hashtag feminism. Journal of arts and humanities, 3(7), 34-40.
[12] Clark-Parsons, R. (2018). Building a digital Girl Army: The cultivation of feminist safe spaces online. New Media & Society, 20(6), 2125-2144.
[13] Rentschler, C. A., & Thrift, S. C. (2015). Doing feminism in the network: Networked laughter and the 'Binders Full of Women'meme. Feminist theory, 16(3), 329-359.
[14] Wu, X. (2020). "Straight Man Cancer": The Discursive Representation and Backlash of Sexism on Chinese Internet. Gender Equality in Changing Times: Multidisciplinary Reflections on Struggles and Progress, 181-201.
[15] Lazuka, R. F., Wick, M. R., Keel, P. K., & Harriger, J. A. (2020). Are we there yet? Progress in depicting diverse images of beauty in Instagram's body positivity movement. Body image, 34, 85-93.
[16] Han, X. (2021). Uncovering the low-profile# MeToo movement: Towards a discursive politics of empowerment on Chinese social media. Global Media and China, 6(3), 364-380.
[17] Lin, Z., & Yang, L. (2019). Individual and collective empowerment: Women's voices in the# MeToo movement in China. Asian Journal of Women's Studies, 25(1), 117-131.
[18] Yang, Y. (2022). When positive energy meets satirical feminist backfire: Hashtag activism during the COVID-19 outbreak in China. Global Media and China, 7(1), 99-119.
[19] Yin, S., & Sun, Y. (2021). Intersectional digital feminism: Assessing the participation politics and impact of the MeToo movement in China. Feminist Media Studies, 21(7), 1176-1192.
[20] Lindberg, F. (2021). Women's Rights in China and Feminism on Chinese Social Media. Institute for Security & Development Policy.
[21] Núñez Puente, S. (2011). Feminist cyberactivism: Violence against women, internet politics, and Spanish feminist praxis online. Continuum: Journal of Media & Cultural Studies, 25(03), 333-346.
[22] Mendes, K., Ringrose, J., & Keller, J. (2019). Digital feminist activism: Girls and women fight back against rape culture. Oxford University Press.
[23] Jeong, E., & Lee, J. (2018). We take the red pill, we confront the DickTrix: Online feminist activism and the augmentation of gendered realities in South Korea. Feminist Media Studies, 18(4), 705-717.
[24] Li, X. (2020). How powerful is the female gaze? The implication of using male celebrities for promoting female cosmetics in China. Global Media and China, 5(1), 55-68.
[25] Skelton, C. (2002). Constructing dominant masculinity and negotiating the'male gaze'. International Journal of Inclusive Education, 6(1), 17-31.
[26] Calogero, R. M. (2004). A test of objectification theory: The effect of the male gaze on appearance concerns in college women. Psychology of women quarterly, 28(1), 16-21.
[27] Nielsen, R. A. (2020). Women's authority in patriarchal social movements: the case of female Salafi preachers. American Journal of Political Science, 64(1), 52-66.
[28] Burke, E. (2006). Feminine visions: Anorexia and contagion in pop discourse. Feminist Media Studies, 6(3), 315-330.
[29] Glapka, E. (2018). 'If you look at me like at a piece of meat, then that'sa problem'–women in the center of the male gaze. Feminist Poststructuralist Discourse Analysis as a tool of critique. Critical Discourse Studies, 15(1), 87-103.
[30] Martin, P. Y. (2006). Practising gender at work: Further thoughts on reflexivity. Gender, work & organization, 13(3), 254-276.
[31] Louie, K. (2014). Chinese masculinity studies in the twenty-first century: Westernizing, Easternizing and globalizing wen and wu. NORMA: International Journal for Masculinity Studies, 9(1), 18-29.
[32] Louie, K. (2002). Theorising Chinese masculinity: Society and gender in China. Cambridge University Press.
[33] Chan, J. (2020). Chinese American Masculinities: From Fu Manchu to Bruce Lee. Routledge.
[34] Szeto, K. Y. (2011). The Martial Arts Cinema of the Chinese Diaspora: Ang Lee, John Woo, and Jackie Chan in Hollywood. SIU Press.
[35] Chow, Y. F. (2008). Martial arts films and Dutch–Chinese masculinities: Smaller is better. China Information, 22(2), 331-359.
[36] IidaHuman Rights Watch (HRW). (2020). "China: Online Gender-based Violence Targets Women." https://www.hrw.org/
[37] Donaldson, M. (1993). What is hegemonic masculinity?. Theory and society, 643-657.
[38] Peng, A. Y. (2021). Neoliberal feminism, gender relations, and a feminized male ideal in China: A critical discourse analysis of Mimeng's WeChat posts. Feminist Media Studies, 21(1), 115-131.

DOI: 10.54254/2753-7064/40/20242194

[39] Yang, F. (2023). Post-feminism and chick flicks in China: Subjects, discursive origin and new gender norms. Feminist Media Studies, 23(3), 1059-1074.
[40] Rottenberg, C. (2014). The rise of neoliberal feminism. Cultural studies, 28(3), 418-437.
[41] Song, G., & Hird, D. (2014). Men and masculinities in contemporary China. In Men and Masculinities in Contemporary China. Brill.
[42] Zhang, X. (2019). Narrated oppressive mechanisms: Chinese audiences' receptions of effeminate masculinity. Global Media and China, 4(2), 254-271.
[43] Katila, S., & Eriksson, P. (2013). He is a firm, strong-minded and empowering leader, but is she? Gendered positioning of female and male CEOs. Gender, Work & Organization, 20(1), 71-84.
[44] Fairclough, N. (2015). Language and Power. Longman.
[45] Van Dijk, T. A. (2013). Discourse and Knowledge: A Sociocognitive Approach. Cambridge University Press.
[46] Solnit, R. (2014). Men explain things to me. Haymarket books.

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242210

Can Pain Be Understood by Words?

– A Literature Review of Pain-Language Association

Yanjie Jin[1,a,*]

[1]*Department of Computer Science and Mathematics, Kingston University, London, United Kingdom*
a. Yanjiejin9@gmail.com
**corresponding author*

Abstract: *This* review systematically explores the complicated interplay between pain and language, including nociceptive pain and empathic pain. While previous study focusing on physiological aspects of pain, this paper addressed how linguistics influence pain communication and perception. The finding reveals that language can influence bother subjective pain and the pain when we observe others. It is notable that the use of specific pain descriptors and metaphors significantly impacts individuals' pain perception and linguistic context can influence people's nociceptive pain experience. For empathic pain, there are similar brain activations when communicating with people who are suffering from pain. Besides, there is evidence that communication and interactions can benefit painful patients and reduce pain. To conclude, this paper empathizes the vital role language plays in individual's own pain experience and feeling others' pain. Future studies should aim to have standardized tools and frameworks for studying the linguistic aspect of pain, especially in the social inter-brain context, which is vital for understanding and communicating pain. Addressing the linguistic dimension of pain can help with pain assessment and management, leading to better patient care.

Keywords: Neurolinguistics, Multidimensional pain, Pain-related words, Empathic pain, Communication.

1. Introduction

Pain is not only a physical sensation but a multidimensional experience. More attention is being paid on the association between language and pain lately, highlighting the complicated ways in which language impacts nociceptive perception.

This paper aims to explore pain-language associations and build a fundamental understanding of how language impacts pain perception. The pain mentioned in this paper includes both nociceptive and empathic pain. Nociceptive pain is a subjective experience as a result of tissue impairment and empathic pain is the one caused by recognizing and understanding another person's pain. This research consists of two sections:

The first part is a review of language on nociceptive pain experience and the second part dives into the empathic pain. For the first part, the multidimensional nature of pain provides a basic framework for exploring existing studies. Based on this framework, investigations focus on current neurolinguistic studies of this subjective pain, exploring further language-pain influences.

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242210

As for the second part, it will be the discussion about the empathic pain and the similarity of brain activation during empathic pain and nociceptive pain experience. Then the paper explores how language effect empathy which is the core of empathic pain. To study empathic pain, especially in social context, a new technique called hyperscanning is introduced. The exploration of hyperscanning in social context begins with face-face communication to how it is applied in the field of pain.

Knowing how language impacts on pain is helpful to enhance the effectiveness of communication across patients with various pain and enriches understanding of pain.

2. Multidimensional Nociceptive Pain Experience

The pain definition was refined by the IASP (International Association for the Study of Pain) Council in 2020. The most updated pain definition is “an adverse sensory and emotional experience associated with, existing or potential tissue injury”. The supplementary note “pain is impacted to different extents by biological, psychological, and social elements" emphasizes that it cannot be simplified to sensory pathways alone [1].

There are several theories of pain supporting the idea that pain is not only a bodily sensation but consisting of complex components. The "Gate Control Theory" put forward by Melzack and Wall indicates that the nociceptive system is not "hard-wired" but can undergo modulation [2]. In 1968, Melzack and Casey came up with a multidimensional model for the nervous system structures participating in pain. Apart from the neural networks engaged in processing the sensory and discriminative aspect of pain, there are also neural components for reticular formation in the brainstem and limbic system are part of emotional and motivational pain triggers. In sum, this concept states that pain contains sensory-discriminative, cognitive-evaluative, and motivational-affective units [3]. Besides, the neuromatrix theory of pain [4] [5] integrates Melzack and Casey’s model advocated that pain is a complicated experience generated by a unique neural pattern of an extensive neuronal system.

Furthermore, pain modulation also can be categorized to emotional and cognitive components. Feedback loops between pain, emotions, and cognition show that pain affects emotions and cognitive function, while emotional states influence pain intensity. Positive emotional states reduce pain, whereas negative states increase it. Cognitive modulation involves disengaging from the suffering component of pain [6] [7].

According to these theories, the research cases reviewed in the first part will follow the structure based on the components mentioned above: sensory-discriminative, motivational-affective and cognitive-evaluative modulations.

3. Impact of Language on Pain Perception

3.1. Sensory-discriminative Modulation

The use of language can impact on the sensory components such as the neural activation. Pain-related words activated neural circuits affiliated with bodily pain experiences [8]. A similar study clarified if the neural bases of nociceptive pain are shared by semantic pain and if so, to what degree of the portion is. Borelli et al. [9] compared the brain activations caused by noxious stimulation, pain-related words processing, and found evidence for partially shared neural substrates. There are two trials: nociceptive trial and semantic trial. In the first trial, participants received either painful or not mechanical stimulations. Compared to non-painful one, the painful stimuli revealed extensive brain activity in in primary somatosensory cortex, secondary somatosensory cortex, insula, cingulate cortex, thalamus, and dorsolateral prefrontal cortex. As for the second stage, pain-related descriptors, especially words related to social pain, revealed boosted activation in a large part of the brain locations mentioned above.

DOI: 10.54254/2753-7064/40/20242210

3.2. Motivational-affective Modulation

The motivational-affective dimension plays an important role in pain experience. Language can influence the emotional and motivational dimensions of pain through the pain descriptor. Wilson, D et al. investigated the awareness on pain descriptors of persistent pain patients and found increased focus on pain descriptors was related to emotional condition and played an important role in prolonging enduring pain [10].

An interpretative analysis of Chinese pain language was conducted to explore how pain-describing words express people' experiences and perceptions of pain. Pain-describing words are ways to externalize pain expressions, whose lexical meaning of words is inter-subjective and varies based on as medical common sense, living environment, and culture [11]. Besides, the use of pain-related, negative, neutral descriptors has changed the discomfort level of participants. There were more elevated pain ratings of noxious when exposed to pain-related and negative stimulus than neutral primes. Thus, the motivational priming theory for semantic stimuli is convincingly validated by this study finding, showing that affectively negative semantic cues intensify subjective pain perception [12].

A similar study was conducted with the fMRI to detect the detailed brain activation. Ritter et al. [13] found that in contrast an, negative and pain-related words caused increased pain and stronger brain activation; compared to the negative words, pain-related words had a stronger effect. The result can be explained by motivational priming and neural networks theory [13] [14] [15]. Beyond that, the classification of social-pain and physical pain words is another case that language impact on motivational-affective pain components. Borelli et al. [9] found the words related to social pain were assessed as less positive, arousing, pain- associated, and expressing more severe and uncomfortable experiences compared with words expressing physical pain. They offered norms for words expressing bodily and social discomfort. To be more specific, social exclusion phrases can impact the pain perception when it comes to vicarious experience of others' pain. It shows that by affecting the motivation and affection, semantic pain shares some neural substrates with nociceptive pain [16].

3.3. Cognitive-evaluative Modulation

The pain experience also involves cognitive progress, such as defining, assessing, interpreting and evaluating of the pain. To define pain from linguistic perspective, a study suggests a pluralistic view best captures pain semantics, incorporating feelings and bodily states. There are three identified perspectives: the feeling view (semantic content pertains to feelings), the bodily view (semantic content pertains to bodily states), and the pluralist view (semantic content includes both feelings and bodily information) [17]. The study emphasizes the significance of weighing both affective and physical components in the neurolinguistic and psycholinguistic study of pain.

In addition, the language-pain association can be studied in a bilingual context. Gianola et al. [18] explored how linguistic context and cultural orientation influence pain perception among Spanish-English bilingual adults. The Whorfian hypothesis, or linguistic relativity, examines whether language influences thought and provides a framework of language-pain effects. Implementing Wolff and Holmes's [19] Model, Gianola, M et al. [18] further developed the three systems about how language influence pain. The language can serve as attention spotlight, a somatosensory inducer and a sematic processing meddler. The study found that participants rated higher pain intensity while experiencing painful heat in their culturally preferred language, in detail, the Spanish participates reported greater intensity scores in Spanish compared to English.

These findings reveal pain-related words impact people's nociceptive perception by emotion and cognition. With the modern brain imaging techniques such as fMRI, those studies provided evidence

DOI: 10.54254/2753-7064/40/20242210

of neural substrates of semantic pain and nociceptive pain, highlighting the critical role of language in pain perception.

4. Empathic Pain Experience

Language can affect individual's nociceptive pain perception from sensory-analytical, motivational-emotional and cognitive-assessment aspects, the next session is about how language influence people perceiving others' pain.

Empathy refers to a set of psychological capacities which are crucial for humans' social activities. It allows people to comprehend others' thought and feeling, to build emotional connections with them, to convey their emotions and ideas, and to take care of their health [20]. Empathy is the key quality to feel other's pain. Empathic pain is the pain arising from observing or understanding other's pain.

The first half the paper focuses on the pain which is viewed as a personal experience activated by a mental representation of current or possible tissue impairment. The concept of a mental representation is the basis of empathic pain, specifically, with the mental presentation of nociceptive pain, people can associate the subjective pain with the pain perception of others. Based on that, a study found people can also feel pain without a nociceptive stimulus and the associated brain network can also be established.

There are the functional neuroimaging studies supporting the hypothesis that the perception of empathic pain partially activated a mental representation of nociceptive pain, sharing common neural systems [21].

There is also another evidence for neural intersect between empathic pain and pain in the oneself, indicating fundamental mental models [22].

Another research also reveals some insights for the comprehension of the interpersonal and empathic neurological mechanisms. Jackson et al. [23] suggested that there is a brain overlapping between perceived pain and observed pain. They found that observing and evaluating another individual's pain activated some cerebral regions including the anterior cingulate, the anterior insula, the cerebellum, and small part of the thalamus, recognized the vital role in pain processing. Notably, when assessing other's pain, the activation in the anterior cingulate had a strong correlation with this activity, indicating that the activity of this brain region is regulated based on individuals' sensitivity to others' suffering.

Furthermore, Bufalari et al. [24] observed primary somatosensory cortex (S1) activation dependent on assessment of other people's pain and touch, implying that the S1 is involved in feeling one's actual pain along with identifying physical attributes by interacting with other people.

While most neuroimaging studies conducted during empathy for pain focus only on affective aspect of the pain matrix, the studies above provided a new perspective. Empathy is a multifaceted concept made up of emotional, cognitive and somatomotor elements [25]. Therefore, the studies demonstrated that empathy may utilize fundamental mechanisms that enable to align others' sensation individuals' experiences with their sensorimotor framework.

5. Linguistic and Empathy

A study defined the empathy as a multidimensional experience: empathic process involves not only the emotional components but also the cognitive dimensions of empathy are all vital to the empathic process. Empathy itself also should be investigated more on an interdisciplinary basis. Researchers studied how the participants focus on the various facets of empathy and concluded that linguistic analysis can be used to understand the way empathy works in real-world experience. [26].

Linguistic Empathy is the alternative perspective to study empathy from a linguistic view and it is defined as a linguistic representation of the perspective speaker takes regarding the details of the

DOI: 10.54254/2753-7064/40/20242210

utterance, and of the speaker's viewpoint toward people, objects, or concepts they are referring to in their speech. It show that preliminary measure of linguistic empathy is correlated with psychological empathy. They may share information processing algorithms and correlate electro-physiologically [27].

Linguistic, especially the communication and interaction between speakers and listeners, serves as an important element for studying the empathic pain.

6. Hperscanning- A New Technique to Study Joint Action

Hyperscanning has become a popular method to study simultaneous cerebral activation from different people in social context since the first study by Montague et al. [28]. They used two connected fMRI scanners with two participates playing a modified version of the kid's guessing game, which is called "handy dandy." It is used when two or more people participate joint action and researchers can capture the fundamental interconnectivity between two people's cognitive and neural processes during the interaction.

The emerging trend from an intra-brain method to an inter-brain moethod highlights the promising future of Hyperscanning. The stimulus-brain approach is based on the experimental setup and focus works on the neural activities after the stimulation. Brain-brain approach provides a way to study Interactional dynamics among coupled people in social context. In another word, it allows researchers to study the brain activities during joint action when participants take a second perspective [29].

A more concise way to summarise the inter-brain synchronisation measures, we can quantify the similar level of their phase, power or both. More specifically, Ayrolles et al. [30] arranged inter-brain measures into five general classifications, they are: phase synchrony, amplitude/envelope correlation, coherency-based, causality measures and other. It offers an extensive overview for researchers.

Hyperscanning provides the basic technique and the possibility to study the empathic pain.

6.1. Inter-brain Sychronization during Communication

Communication is one kind of joint action that can be examined by hyperscanning. Jiang, J et al. [31]. found that in-person communication has unique neural characteristics which is different with other forms of communication: the alignment of neural processes may be crucial for the effective in-person communication between participates.

According to the type of interaction specified in each study, a review classified spoken communication studies into four categories: knowledge sharing; turn-taking speech co-ordination; cooperation, problem-solving and creativity; and naturalistic discussion paradigms. And the result shows that emerging synchrony has been identified in verbal communication hyperscanning studies. Also, the research defines knowledge exchange, turn-taking, and natural conversation models. The frontal and temporo-parietal areas are the locations where the alignment happened. Finally, paired neuroscience enhances our comprehension of person-to-person communication [32].

6.2. Inter-brain Sychronization for Empathic Pain

Based on the findings in communication brain sychronization, Hyperscanning provides the possibility to study the empathic pain during interpersonal communication and interaction. There are increasing number of research focusing on the interaction of people who suffering from pain and people who listening.

The study conducted by Anzolin et al. [33] investigated brain connectivity between painful patients and health providers during an experiment. Researchers compared a controlled improved context with limited clinical condition. More precisely, the first condition is empathic and the second is business-like. Patients in the empathic condition gave higher scores when it comes to the questions how warm

DOI: 10.54254/2753-7064/40/20242210

and allied are clinicians. The preceding EEG studies showed that Theta band was associated with pain empathy. By analyzing EEG data in this study, it is found that in Theta band, brain-to-brain connectivity volume inside social mirroring and pain/sensorimotor cerebral areas was varied over the provoked pain treatment.

Another research's result suggests that handholding when suffering pain amplifies the interbrain synchronization that shows a correlation with the level of the analgesia and the accurate level observer's empathy [34].

Ellingsen et al. [35] tracked synchronous inter brain connectivity in the health providers and people who suffering chronic pain. There were interactions between the clinicians and patients when the latter group obtained triggered pain. Patients reported less severe pain when engaging with a health provider compared to being by oneself. The findings indicate a paired-brain system supporting pain empathy and caring support.

7. Conclusion

This literature review looks into the language-pain effect for both nociceptive and empathic pain. For nociceptive pain, a sensory-discriminative, motivational-affective and cognitive-evaluative structure is used to summarise how language effects pain, especially the pain descriptors. For empathic pain, hyperscanning technique which is used to study inter-brain connectivity during joint action is introduced. Communication and pain related brain synchronization is the focus in this review. It demonstrates that the language has influence the pain experience deeply.

While there is an increasing number of studies and insights gathered on the relationship between language and, there are still limitations, such as the limited sample size and diversity, the inconsistent language used in different research and self-report evaluation methods for the subjective pain experience.

There are also research gaps that remain in empathic pain. Few studies focus on the language used during the pain-related interaction. There are studies about brain sychronization during communication but when it comes to pain-related experience, there are few studies focusing on linguistic viewpoint and diving into the language to describe the pain and how it influences the empathic pain of others.

To summarize, significant advancements have been made in understanding the language-pain association; however, further exploration is required to address existing knowledge gaps. Investigating the interplay between language and pain not only contributes to the theoretical development of neuroscience and neurolinguistics but also holds practical implications for enhancing communication between patients and healthcare providers, ultimately improving patient care and outcomes.

References

[1] *Raja, S. N., Carr, D. B., Cohen, M., Finnerup, N. B., Flor, H., Gibson, S., Keefe, F. J., Mogil, J. S., Ringkamp, M., Sluka, K. A., Song, X.-J., Stevens, B., Sullivan, M. D., Tutelman, P. R., Ushida, T., & Vader, K. (2020). The revised International Association for the Study of Pain definition of pain: Concepts, challenges, and compromises. PAIN, 161(9). https://journals.lww.com/pain/fulltext/2020/09000/the_revised_international_association_for_the.6.aspx*

[2] *Melzack, R. (2001). Pain and the neuromatrix in the brain. Journal of dental education, 65(12), 1378–1382.*

[3] *Melzack, R., & Wall, P. D. (1965). Pain Mechanisms: A New Theory. Science, 150(3699), 971–979. https://doi.org/10.1126/science.150.3699.971*

[4] *Melzack, R. (2005). Evolution of the neuromatrix theory of pain. The Prithvi Raj Lecture: presented at the third World Congress of World Institute of Pain, Barcelona 2004. Pain practice : the official journal of World Institute of Pain, 5(2), 85–94. https://doi.org/10.1111/j.1533-2500.2005.05203.x*

[5] *Melzack, R., & Casey, K. (1968). Sensory, Motivational, and Central Control Determinants of Pain. In The Skin Senses (pp. 423–439).*

[6] Bushnell, M. C., Ceko, M., & Low, L. A. (2013). Cognitive and emotional control of pain and its disruption in chronic pain. Nature reviews. Neuroscience, 14(7), 502–511. https://doi.org/10.1038/nrn3516
[7] Ingvar, M. (1999). Pain and functional imaging. Philosophical transactions of the Royal Society of London. Series B, Biological sciences, 354(1387), 1347–1358. https://doi.org/10.1098/rstb.1999.0483
[8] Borelli, E., Crepaldi, D., Porro, C. A., & Cacciari, C. (2018). The psycholinguistic and affective structure of words conveying pain. PLOS ONE, 13(6), e0199658. https://doi.org/10.1371/journal.pone.0199658
[9] Borelli, E., Benuzzi, F., Ballotta, D., Bandieri, E., Luppi, M., Cacciari, C., Porro, C. A., & Lui, F. (2023). Words hurt: common and distinct neural substrates underlying nociceptive and semantic pain. Frontiers in neuroscience, 17, 1234286. https://doi.org/10.3389/fnins.2023.1234286
[10] Wilson, D., Williams, M., & Butler, D. (2009). Language and the pain experience. Physiotherapy research international : the journal for researchers and clinicians in physical therapy, 14(1), 56–65. https://doi.org/10.1002/pri.424
[11] Rui, L., Xinchun, S., & Cun, J. (2014). Pain-describing Words and Linguistic Representation of Pain Experience. International Journal of Knowledge and Language Processing, 5, 1–11.
[12] Richter, M., Schroeter, C., Puensch, T., Straube, T., Hecht, H., Ritter, A., Miltner, W. H., & Weiss, T. (2014). Pain-related and negative semantic priming enhances perceived pain intensity. Pain research & management, 19(2), 69–74. https://doi.org/10.1155/2014/425321
[13] Ritter, A., Franz, M., Miltner, W. H. R., & Weiss, T. (2019). How words impact on pain. Brain and Behavior, 9(9), e01377. https://doi.org/10.1002/brb3.1377
[14] Lang, P. J. (1995). The emotion probe: Studies of motivation and attention. American Psychologist, 50(5), 372–385. https://doi.org/10.1037/0003-066X.50.5.372
[15] Pulvermüller, F., & Fadiga, L. (2010). Active perception: sensorimotor circuits as a cortical basis for language. Nature reviews. Neuroscience, 11(5), 351–360. https://doi.org/10.1038/nrn2811
[16] Vitale, F., Urrutia, M., Avenanti, A., & de Vega, M. (2023). You are fired! Exclusion words induce corticospinal modulations associated with vicarious pain. Social Cognitive and Affective Neuroscience, 18(1), nsad033. https://doi.org/10.1093/scan/nsad033
[17] Coninx, S., Willemsen, P., & Reuter, K. (2024). Pain Linguistics: A Case for Pluralism. The Philosophical Quarterly, 74(1), 145–168. https://doi.org/10.1093/pq/pqad048
[18] Gianola, M., Llabre, M. M., & Losin, E. A. R. (2024). Does pain hurt more in Spanish? The neurobiology of pain among Spanish–English bilingual adults. Social Cognitive and Affective Neuroscience, 19(1), nsad074. https://doi.org/10.1093/scan/nsad074
[19] Wolff, P., & Holmes, K. (2011). Linguistic Relativity. Wiley Interdisciplinary Reviews: Cognitive Science, 2, 253–265. https://doi.org/10.1002/wcs.104
[20] Stanford Encyclopedia of Philosophy. (n.d.). Empathy. In E. N. Zalta (Ed.), Stanford University. Retrieved July 5, 2024, from https://plato.stanford.edu/entries/empathy/#EmpPhiProOthMin
[21] Jackson, P. L., Rainville, P., & Decety, J. (2006). To what extent do we share the pain of others? Insight from the neural bases of pain empathy. Pain, 125(1), 5–9. https://doi.org/10.1016/j.pain.2006.09.013
[22] Zaki, J., Wager, T. D., Singer, T., Keysers, C., & Gazzola, V. (2016). The anatomy of suffering: understanding the relationship between nociceptive and empathic pain. Trends in cognitive sciences, 20(4), 249-259.
[23] Jackson, P. L., Meltzoff, A. N., & Decety, J. (2005). How do we perceive the pain of others? A window into the neural processes involved in empathy. NeuroImage, 24(3), 771–779. https://doi.org/10.1016/j.neuroimage.2004.09.006
[24] Bufalari, I., Aprile, T., Avenanti, A., Di Russo, F., & Aglioti, S. M. (2007). Empathy for Pain and Touch in the Human Somatosensory Cortex. Cerebral Cortex, 17(11), 2553–2561. https://doi.org/10.1093/cercor/bhl161
[25] Davis, M.H. (1996). Empathy: A Social Psychological Approach (1st ed.). Routledge. https://doi.org/10.4324/9780429493898
[26] Herlin I, Visapää L. Dimensions of empathy in relation to language. Nordic Journal of Linguistics. 2016;39(2):135-157. doi:10.1017/S0332586516000111
[27] Kann, T., Berman, S., Cohen, M. S., Goldknopf, E., Gülser, M., Erlikhman, G., Trinh, K., Yokoyama, O. T., & Zaidel, E. (2023). Linguistic Empathy: Behavioral measures, neurophysiological correlates, and correlation with Psychological Empathy. Neuropsychologia, 191, 108650. https://doi.org/10.1016/j.neuropsychologia.2023.108650
[28] Montague, P. R., Berns, G. S., Cohen, J. D., McClure, S. M., Pagnoni, G., Dhamala, M., Wiest, M. C., Karpov, I., King, R. D., Apple, N., & Fisher, R. E. (2002). Hyperscanning: simultaneous fMRI during linked social interactions. NeuroImage, 16(4), 1159–1164. https://doi.org/10.1006/nimg.2002.1150
[29] Zamm, A., Loehr, J. D., Vesper, C., Konvalinka, I., Kappel, S. L., Heggli, O. A., Vuust, P., & Keller, P. E. (2024). A practical guide to EEG hyperscanning in joint action research: from motivation to implementation. Social cognitive and affective neuroscience, 19(1), nsae026. https://doi.org/10.1093/scan/nsae026

[30] *Ayrolles, A., Brun, F., Chen, P., Djalovski, A., Beauxis, Y., Delorme, R., Bourgeron, T., Dikker, S., & Dumas, G. (2021). HyPyP: a Hyperscanning Python Pipeline for inter-brain connectivity analysis. Social Cognitive and Affective Neuroscience, 16(1–2), 72–83. https://doi.org/10.1093/scan/nsaa141*

[31] *Jiang, J., Dai, B., Peng, D., et al. (2012). Neural synchronization during face-to-face communication. In: Journal of Neuroscience, 32, 16064–69.*

[32] *Kelsen, B. A., Sumich, A., Kasabov, N., Liang, S. H. Y., & Wang, G. Y. (2022). What has social neuroscience learned from hyperscanning studies of spoken communication? A systematic review. Neuroscience & Biobehavioral Reviews, 132, 1249–1262. https://doi.org/10.1016/j.neubiorev.2020.09.008*

[33] *Anzolin, A., Grahl, A., Isenburg, K., Toppi, J., Ciaramidaro, A., Zuckerman, M. B., Yucel, M., Ellingsen, D.-M., Astolfi, L., Kaptchuk, T. J., & Napadow, V. (2021). Brain-to-brain patient-clinician connectivity is directionally modulated by chronic low back pain therapy: An electroencephalography hyperscan approach. The Journal of Pain, 22(5), 601. https://doi.org/10.1016/j.jpain.2021.03.093*

[34] *Goldstein, P., Weissman-Fogel, I., Dumas, G., & Shamay-Tsoory, S. G. (2018). Brain-to-brain coupling during handholding is associated with pain reduction. Proceedings of the National Academy of Sciences, 115(11), E2528–E2537. https://doi.org/10.1073/pnas.1703643115*

[35] *Ellingsen, D.-M., Isenburg, K., Jung, C., Lee, J., Gerber, J., Mawla, I., Sclocco, R., Grahl, A., Anzolin, A., Edwards, R. R., Kelley, J. M., Kirsch, I., Kaptchuk, T. J., & Napadow, V. (2023). Brain-to-brain mechanisms underlying pain empathy and social modulation of pain in the patient-clinician interaction. Proceedings of the National Academy of Sciences, 120(26), e2212910120. https://doi.org/10.1073/pnas.2212910120*

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242236

The Rural-Urban Intermarriage and Female Identity Formation in Contemporary China

Peini Li[1,a,*]

[1]*Sichuan University, No.24 South Section 1, Yihuan Road, Chengdu, China*
a. pennyyerin@gmail.com
**corresponding author*

Abstract: This article analyzes the marital experiences of rural-urban female migrants in contemporary China through qualitative semi-structured interviews. It argues that these women have gained more autonomy and higher status within their families through intermarriage. Despite these improvements, they continue to face significant prejudices and pressures from family members and society. The empirical research reveals that female migrants often struggle with managing relationships with their elders. Additionally, differences in economic income and the division of domestic labor lead to conflicts over household finances between female migrants and their partners. The study found that female migrants are under multiple pressures from their partners and parents-in-law, often choosing to compromise in domestic conflicts. Overall, the autonomy that female migrants exhibit in intermarriages highlights a significant transformation in their self-determination and self-identification.

Keywords: Intermarriage, rural-urban migration, female migrants.

1. Introduction

Since the implementation of China's opening-up and reform policy in the 1980s, there has been a notable increase in the interaction of people, trade, and information flow between urban and rural areas. Simultaneously, the migration of rural populations to urban regions has intensified, with rural-to-urban migrant workers actively engaging in urban employment. Compared to their male counterparts, female migrant workers have drawn significant attention from sociologists due to the unequal treatment they receive based on gender and their adaptive responses to new living environments. A growing body of academic research focuses on the experiences of female migrant workers and broader social transformations.

This research examines the gradual integration of female migrant workers into the urban workforce and the imbalanced status of rural women in intermarriage. Intermarriage refers to marriages between different social groups. In intra-group marriages between similar social groups, elements such as religious beliefs, ethnicity, and social strata are critical in mate selection. These factors are equally crucial in intermarriages. Intermarriage is not an index of assimilation but a continuous process of mate selection based on the aforementioned elements [1]. The intermarriage discussed in this paper focuses on the marital relationships between rural migrant workers in cities and urban residents.

Since the implementation of the opening-up and reform policy, an increasing number of female migrant workers have chosen to settle in cities. Over the past 30 years, the challenges faced by these

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242236

women have expanded from workplace employment to family relationships. Compared to intra-marriages between urban citizens, intermarital couples exhibit distinctive characteristics, including differences in social class, gender dynamics, and family relationships. In China's traditional patriarchal society, family-centric ideology emphasizes the supremacy of the husband. Within this cultural context, rural women may find it challenging to manage family conflicts with their urban husbands. Additionally, they face status differences with their children, as those born and raised in urban areas inherently identify more with urban life and culture. Therefore, it is imperative to study the family lives of married rural women currently living in urban areas. This research will facilitate a better understanding of the gender dynamics in intermarriage and the uneven development between rural and urban areas due to a series of institutional and social factors.

2. Literature Review

Existing research has illustrated that the household registration system (hukou) has played a crucial role in the regional disparities experienced by migrant workers in contemporary China. Liu [2] highlights the unequal hierarchy between rural and urban residents due to the hukou system, widely known as the rural-urban dual system. Established in the 1950s, the hukou system classifies people as either rural residents or urban citizens to control population mobility. Rural hukou often pose significant obstacles for migrant workers when applying for jobs [3]. Meanwhile, Zhan [4] argues that social exclusion and labor market limitations constrain migrant workers' career choices. He asserts that even if the hukou system were abolished, the well-being and living quality of migrant workers would not improve significantly. This is due to the transformations brought about by the opening-up and reform policies launched in the 1980s. Despite the waning influence of the hukou system, rural migrants continue to face discrimination in urban areas. To settle in urban areas, they must obtain urban citizenship and improve their income.

Gender and marriage-related issues have also emerged among rural-urban female migrants. These women have developed individual strategies to advance their social status through marital relationships with urban males. For rural women seeking to migrate, the economic aspect of marriage often takes precedence over affection [5]. The division in legal citizenship leads to cultural prejudice against rural migrants within urban areas, which further affects the intimate relationships of intermarital families. Even if people do not explicitly express their prejudice, hukou remains a critical element in mate selection. In the marriage market, individuals with rural hukou status are often perceived as having more pragmatic concerns. Specifically, within the marital hierarchy across rural counties and urban cities, individuals holding urban household status typically assume a dominant role in marriages. From their perspective, rural females are regarded as more "naïve" and sensible, making them more popular with urban males. Given the existence of the household registration system in contemporary China, marriage has become a channel for upward social mobility rather than merely a lived experience. Rural female migrants proactively choose male partners who can help improve their political and economic welfare in urban regions, even if these partners are not always attractive. Thus, marriage serves as a means for achieving upward social mobility [5]. This social phenomenon is similar to that of Indian society, where dowries compensate the bride's rural family with material benefits, reaffirming that marriage can be partially economic [6]. Upon marriage, rural females are often burdened with domestic work and remain invisible within social communities in urban areas. In Vietnam, migrant women face heavy marginalization and distrust from local inhabitants. These female "outsiders" are constrained within their homes, as they are not welcomed or allowed to frequent public spaces. This ambiguous position undermines migrant women in both family and social contexts [7].

DOI: 10.54254/2753-7064/40/20242236

3. Research Methods

Qualitative semi-structured interviews were conducted to collect data for this research. In total, four in-person interviews were conducted, each lasting between 15 to 30 minutes and audio-recorded with the interviewees' consent. The recordings were transcribed verbatim for analysis. Participants were purposively sampled to ensure a diverse range of perspectives. The interviews were guided by a semi-structured question list, including queries about the respondents' motivations for getting married, potential disagreements with their partners, their assumptions about marriage, and their current marital experiences. The participants included a 27-year-old civil servant, Li, a 26-year-old civil servant, Chunyan, a 49-year-old teacher, Peng, and a 35-year-old home appliance salesperson, Liu. By collecting rich empirical data from these interviews, this method enables an in-depth understanding of the participants' viewpoints and life experiences. Additionally, this research draws on data from the Third Nationwide Survey on the status of Chinese women and the national census to support the analysis [8-9].

4. Female Migrants and Their Marital Relationships in Urban China

4.1. The Socio-Economic Backgrounds of Female Migrants in China

Since the 1950s, the Chinese government has implemented strict control over the floating population—those who do not live in their registered place of residence. According to the Regulations of the People's Republic of China on Residence Registration , citizens migrating from rural to urban areas must provide various proofs to enter and settle in cities, such as labor contracts approved by the Human Resource and Social Security Bureau in the receiving city, admission certificates from schools, or approval for relocation from urban household registration authorities[10]. Until the 1970s, these restrictions on rural-to-urban migration were strictly enforced, strongly encouraging the floating population to leave cities and return to their hometowns [11-12]. The data report of the Third Survey on the Social Status of Chinese Women shows that among women who are currently on the move, 87.9 percent are engaged in income-generating work, and 61.5 percent are satisfied with their work and life while away from home [8]. The main problems encountered by migrant women while working in urban areas are 'being looked down upon' and 'wages being owed or withheld,' accounting for 14.7 percent and 14.2 percent, respectively. Additionally, among married female migrants, 15.7 percent met their spouses outside rural areas, indicating that the scope of intermarriage among rural migrant women has expanded. However, the persistent issues of discrimination and wage withholding highlight the social and economic barriers these women face, despite their contributions to the urban workforce and their personal satisfaction with their employment situations.

Consequently, the lack of economic gains influences the labor division within the households of female migrants. During the interviews, three participants, Chunyan, Li, and Peng, who work as civil servants, stated that their employment contributed significantly to their families' income. In contrast, another participant, Liu, decided to quit her job when she got married and became pregnant. She had been completely relying on her husband for about four years. Liu said: "Before getting married, I worked at a jewelry store. The salary was not high, and the workplace was far from home. My husband and his parents wanted me to stay at home and take care of the children, so I decided to resign." This reflects traditional gender roles in the employment decisions of female migrants. The difference among the interviewees shows that when a female migrant has significantly lower economic income compared to her husband, her status within the family tends to be lower, and ultimately, it is the husband who holds decision-making power. Moreover, females often assume a traditional role, focusing on supporting their husbands and raising the children.

DOI: 10.54254/2753-7064/40/20242236

After marriage, all participants experienced a gradual reduction in their social circles and increasingly relied on their husbands' social networks, leading to a contraction of their personal living space. Notably, both interviewees Peng and Liu indicated that most of their post-marriage friendships originated from their husbands' pre-marriage social circles. They now have limited contact with friends from before marriage and primarily socialize with their husbands' friends when dining out. This social isolation restricts their access to new information and diminishes their independent support networks. Consequently, these female migrants may perceive themselves as extensions of their husbands, which can negatively impact their self-esteem.

Furthermore, it has been observed that the employment income of female migrants plays a pivotal role in their family dynamics. After marriage, female migrants often encounter social isolation and may experience constraints in their employment choices due to pressures from their husbands' families. Despite many achieving stable economic incomes in urban areas, these female migrants continue to face persistent challenges that warrant further attention and intervention to ensure their well-being and equitable treatment.

4.2. Female Migrants' Attitudes Toward Marriage

Regarding mate selection, female migrants show a strong inclination toward marrying urban men. Historical cases illustrate that even in the last century, migrant women were willing to engage in bigamy to marry city-dwelling men. According to survey data from the Fourth and Fifth National Census of China, motivations such as 'employment and business' and 'marriage migration' consistently outnumber other reasons for migration among women opting to change their residence and hukou [13-14]. This trend underscores several key motivations and attitudes among female migrants. Participant Peng expressed:

"I felt really excited at the thought of going into the city. I really dislike the hygienic conditions in the countryside. I couldn't stand the dirty and messy environment of the courtyard when I was a child." (Interviewee Peng, 49 years old)

Many rural women view marrying urban men as a means to improve their socio-economic status. The prospect of relocating to an urban area and gaining access to better living conditions serves as a significant incentive.

On the contrary, there are female migrants who no longer view marriage as a necessary path to urban life but as a means to pursue their own happiness. During the interviews, participants Peng and Liu mentioned that they met their husbands through social networks involving relatives or friends. Peng mentioned that she initially had no intention of marrying but agreed to the arranged date with her relatives so as not to disappoint them. Liu was introduced to her husband by friends. She expressed that she married him because she wanted to spend her life with someone and sought stability through marriage. Peng, on the other hand, views marriage as a natural progression, stating:

"It is my dream to have a family of myself." (Interviewee Peng, 49 years old)

Compared to older generations, these female migrants now prioritize their own happiness and no longer see marriage as the ultimate life goal.

4.3. Intermarriage Between Rural Female Migrants and Urban Males

Apart from the aforementioned challenges, intermarital couples also encounter difficulties in parenting, particularly concerning the hukou system. In schools, children with urban hukou tend to be more popular than those without. In a child's perception, rural hukou signifies affluence and cultural capital. Conversely, children with urban hukou may face bullying as peers may perceive them to have less virtue. An anecdote from a newspaper report in the 1980s illustrates this disparity--a little girl wrote a letter to her mother, saying: "Mom, I'm sorry, I hope you and dad agree to divorce,

DOI: 10.54254/2753-7064/40/20242236

and when I can switch to urban hukou, you can remarry, because my classmates all make fun of me for being a 'terrestrial repairer'." Consequently, female migrants often face societal discrimination, both externally and within their own families [15].

Within families of female migrants, conflicts arise due to unequal gender roles and disparities in domestic labor division. Given the disparity in hukou status, marriages between rural female migrants and urban males often involve a "status exchange", where each partner brings different social resources to the relationship [16]. This exchange typically entails one spouse having an advantage in background while the other holds a higher social status. Despite not being entirely equal in background or social status, they achieve balance within the family by mutually leveraging their respective advantages. For instance, the female migrant may face economic disadvantages compared to the urban male, and therefore gains economic stability and uplift through marriage. In return, her husband may expect her to assume primary responsibility for family care and domestic chores. During the interviews, it became evident that the most common conflicts between spouses revolved around childcare and financial matters. Participants Peng and Liu noted that women predominantly shoulder the responsibility for childcare. The lack of support from men contributes to physical and mental exhaustion and creates an imbalance in family roles. Additionally, women often manage household expenses such as grocery shopping and daily necessities. Over time, unresolved financial disputes accumulate, straining marital relationships and potentially leading to divorce in severe cases. Therefore, persistent inequality in gender roles can undermine marital harmony, leaving women feeling dissatisfied and resentful, while men may remain unaware of their wives' sentiments.

It is common for women to gain economic stability and social status through marriage. However, if their contributions are not recognized by their husband's parents, the balance of the "status exchange" is disrupted, eventually leading to family conflicts [16]. Notably, a female's economic situation significantly impacts her marital experiences. Specifically, the husband's parents often look down on female migrants because of their lower economic status compared to their sons. During the interview, participant Peng's remarks exemplified this:

"There were a lot of disagreements between me and my parents in law. That becomes the main source of conflict in the early stages of our marriage. His parents felt that I didn't fit the role of a good wife." (Interviewee Peng, 49 years old)

Similarly, participant Liu encountered a similar issue in her marriage:

"My parents in law think that if I don't have a job, I can't take care of my child well, and they often undermine me behind my back." (Interviewee Liu, 35 years old)

Compared to other married women, migrant females find it more challenging to manage relationships with their elders. Moreover, living with their husband's family and being distant from their own families, migrant females face greater difficulties in receiving emotional support from their parents. In marital conflicts, female migrants typically experience pressure from two fronts: their husband and their parents-in-law. This places them at a disadvantage during disputes and often leads to greater likelihood of compromise. Consequently, female migrants struggle to attain equal rights and respect within marriage.

5. Conclusion

Over the past four decades, China's rural revitalization strategy and urbanization development have narrowed the economic gap between urban and rural areas. Intermarriage between individuals with rural and urban hukou has also become increasingly common. However, prejudices among urban residents against women with rural household registrations persist. This study finds that for female migrants, intermarriage is no longer merely a means to access urban life as it was in the past, but rather a choice for autonomous living in cities, facilitated either through marriage or employment. Drawing on the theory of "status exchange", this research reveals that differences in economic income

DOI: 10.54254/2753-7064/40/20242236

and domestic labor division often lead female migrants into conflicts with their partners over family finances [16]. Moreover, pressure from both husbands and parents-in-law frequently compels female migrants to conform or compromise when faced with family issues. As a result, while female migrants in intermarriages have achieved greater autonomy and higher status within their families, they continue to contend with prejudices and societal pressures from both family members and broader society.

References

[1] *Marcson, Simon. "A Theory of Intermarriage and Assimilation." Social Forces, vol. 29, no. 1, 1950, pp. 75–78. JSTOR, https://doi.org/10.2307/2572762. Accessed 1 July 2024.*

[2] *Lui, Lake. "Gender, Rural-Urban Inequality, and Intermarriage in China." Social Forces, vol. 95, no. 2, 2016, pp. 639–62. JSTOR, http://www.jstor.org/stable/26166845. Accessed 1 July 2024.*

[3] *Alexander, Peter and Anita Kit-wa Chan. "Does China have an apartheid pass system?" Journal of Ethnic and Migration Studies 30 (2004): 609 - 629.*

[4] *Zhan, Shaohua. "What Determines Migrant Workers' Life Chances in Contemporary China? Hukou, Social Exclusion, and the Market." Modern China, vol. 37, no. 3, 2011, pp. 243–85. JSTOR, http://www.jstor.org/stable/23053315. Accessed 9 July 2024.*

[5] *Fan, C. Cindy, and Youqin Huang. "Waves of Rural Brides: Female Marriage Migration in China." Annals of the Association of American Geographers, vol. 88, no. 2, 1998, pp. 227–51. JSTOR, http://www.jstor.org/stable/2564209. Accessed 9 July 2024.*

[6] *Rao, Smriti, and Kade Finnoff. "Marriage Migration and Inequality in India, 1983-2008." Population and Development Review, vol. 41, no. 3, 2015, pp. 485–505. JSTOR, http://www.jstor.org/stable/24638659. Accessed 9 July 2024.*

[7] *Nguyen, Linh Khanh. "Women as Fish: Rural Migration and Displacement in Vietnam." Connected and Disconnected in Viet Nam: Remaking Social Relations in a Post-Socialist Nation, edited by PHILIP TAYLOR, ANU Press, 2016, pp. 109–40. JSTOR, http://www.jstor.org/stable/j.ctt1bw1h95.7. Accessed 9 July 2024.*

[8] *All-China Women's Federation, National Bureau of Statistics of China. "Report on Major Results of the Third Wave Survey on The Social Status of Women in China" 2011.10.21 http://www.china.com.cn/zhibo/zhuanti/ch-xinwen/2011-10/21/content_23687810.htm*

[9] *National Bureau of Statistics of China. "Seventh National Population Census of the People's Republic of China." 2020, https://www.stats.gov.cn/sj/pcsj/rkpc/7rp/indexch.htm*

[10] *Ministry of Public Security. (1977, November). Regulations of the Ministry of Public Security on handling household registration migration. Retrieved from China Government Website: https://www.gov.cn/xinwen/2014-07/30/content_2727331.htm#:~:text=%EF%BC%91%EF%BC%99%EF%BC%96%EF%BC%94%E5%B9%B4%EF%BC%98%E6%9C%88%E3%80%8A,%E5%B8%82%E7%9A%84%E8%A6%81%E4%B8%A5%E5%8A%A0%E9%99%90%E5%88%B6%E3%80%82*

[11] *State Council. (1989, October 31). Notice of the State Council on strictly controlling the rapid growth of rural-to-urban migration. Retrieved from China Government Website: https://www.gov.cn/zhengce/content/2011-09/07/content_5972.htm*

[12] *Ministry of Public Security, Ministry of Grain. (1979, June 9). Report on opinions on strictly controlling the conversion of agricultural population to non-agricultural population. Retrieved from China Government Website: https://www.gov.cn/zhengce/content/2018-05/30/content_5294750.htm*

[13] *National Bureau of Statistics of China. "Forth National Population Census of the People's Republic of China." 1990, https://www.stats.gov.cn/sj/tjgb/rkpcgb/qgrkpcgb/index_1.html*

[14] *National Bureau of Statistics of China. "Fifth National Population Census of the People's Republic of China." 2000, https://www.stats.gov.cn/sj/pcsj/rkpc/5rp/index.htm*

[15] *Li, C. H. (2013). The pain of rural-to-urban transition: An imprint of an era. National Humanities and History.*

[16] *Davis, K. 1941. "Intermarriage in Caste Societies." American Anthropologist 43:376-95*

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242219

Exploring the Identity of Chinese Cultural Relics on British Museum Websites Through Multimodal Discourse Analysis: A Case Study of the Official Website

Heting Feng[1,a,*]

[1]*Communication University of Zhejiang, Baiyang Street, Hangzhou, China*
a. 1871604156@qq.com
**corresponding author*

Abstract: The aim of this study is to explore the re-construction of Chinese cultural identity in the British Museum's official website and analyze how its exhibition strategies influence the audience's perception and understanding of Chinese artifacts. By employing a multimodal discourse analysis method that combines textual and visual analysis, the study examines how the British Museum's official website presents the identity of Chinese artifacts from cultural, contextual, and formal perspectives. Additionally, utilizing the identity theory from a constructivist perspective, the study analyzes how identity is dynamically constructed, negotiated, and communicated through discourse. The research findings indicate that the identity of Chinese artifacts displayed on the British Museum's official website is relatively weak, suggesting room for more improvements. It is recommended to establish cooperative relationships with museums in the countries of origin of the artifacts to maintain the connection between artifacts and their original cultures, thereby promoting the inheritance of cultural heritage.

Keywords: Intercultural communication, Multimodal Discourse Analysis, Identity, Museums, Chinese Heritage.

1. Introduction

1.1. Research Background and Questions

The British Museum, established in 1753, is the largest and most famous museum in the UK, focusing on the preservation and documentation of classical artifacts [1]. Nevertheless, controversy over the ownership of its collection, especially those originating from colonial era conquests, has always existed [2]. As a repository of a vast array of cultural heritage, the British Museum has become a frequent target of criticism in such discussions [3]. Among its collections, there are approximately 23,000 Chinese cultural relics, including bronzeware, paintings, and jade items, showcasing China's rich cultural heritage [4]. When these Chinese artifacts are placed within the context of the British Museum, they inevitably face a cultural identity dislocation. Against this backdrop, what measures has the British Museum taken to reconstruct the cultural identity of these Chinese artifacts? This undoubtedly merits further exploration.

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242219

1.2. Object of Study

This paper selects the "China and South Asia" page on the official website of the British Museum as its object of study. With the rapid development of the internet, museums around the world have established their own official online platforms to enhance their public outreach efforts [5]. In conducting an in-depth analysis of the content on the British Museum's official website, this research adopts the method of multimodal discourse analysis. This analytical approach involves both textual and visual dimensions, aiming to explore how the British Museum's official webpage presents Chinese artifacts from the perspectives of formal and cultural context levels within the multimodal discourse analysis framework [6]. Through the constructivist viewpoint within identity theory, this paper further elucidates how the website constructs new identity recognition for these Chinese artifacts through its display strategies. Notably, this study's analysis and discussion will simultaneously focus on both the artifacts themselves and the museum. This dual-pronged research method is due to the close interrelationship between the artifacts and their exhibiting venue—that is, the museum [7]. A comprehensive examination of these two aspects allows for a deeper understanding of how the British Museum utilizes its website platform not only to showcase but also to reconstruct the cultural identity of Chinese artifacts.

2. Theoretical framework

2.1. Multimodal Discourse Analysis Theory

The development of digital technology has transformed human communication modes from primarily relying on a single language to encompassing a variety of complex media including language, images, and sounds [8]. Therefore, traditional text analysis alone is no longer sufficient to fully understand social behavior and its underlying meanings. Since the 1990s, multimodal discourse has become a key area of study in social semiotics. Based on Halliday's systemic functional grammar theory, scholars have further explored multiple dimensions of multimodal grammar, including visual grammar, color grammar, and musical grammar [9]. These studies not only inherit Halliday's foundational systemic functional grammar but also extend traditional grammar analysis to non-textual symbols. For instance, research on visual grammar reveals the role of images and visual elements in information transmission and meaning generation [10], color grammar discusses the role of color in communication, and musical grammar examines the connection between musical structure and semiotics [9]. Multimodal discourse, as a mode of communication, involves auditory, visual, and tactile senses and achieves communication through various symbolic resources such as language, images, sounds, and actions [11]. This multidimensional communication mode emphasizes that besides text, other elements like visuals and sounds can also convey complex and rich information.

In current academic discussions on multimodal discourse analysis, systemic functional linguistics is widely regarded as a very suitable theoretical model [8]. The core view of systemic functional linguistics is that language is a multifunctional system, whose functions are realized in different social and cultural contexts [12]. For multimodal discourse, systemic functional linguistics provides a powerful tool for analyzing and interpreting different symbolic systems, including language, images, and sounds. This analytical method focuses not only on the internal structure of a single modality but also emphasizes the interaction and integration between different modalities [8]. Its theoretical framework does not need any fundamental changes to accommodate new analytical purposes. Although the scope of multimodal discourse analysis continues to expand, systemic functional linguistics theory remains directly applicable without modification. Martin summarized this

DOI: 10.54254/2753-7064/40/20242219

framework as consisting of five system levels: cultural, contextual, meaning, formal, and media levels. This paper mainly focuses on the cultural, contextual, and formal levels.

The cultural level is key to multimodal communication, determining traditions, forms, and technologies of communication. Without the cultural level, situational context cannot be explained [13]. This level includes people's thought patterns, philosophy of life, living habits, and societal norms that constitute ideology, as well as the communicative procedures or structural potentials that realize this ideology, known as genres [6]. In specific contexts, communication is constrained by contextual factors determined by discourse range, discourse tone, and discourse mode. Meanwhile, this process must also realize the chosen genre in a certain communicative mode. At the discourse meaning level, there are conceptual meanings, interpersonal meanings, and compositional meanings constrained by discourse range, discourse tone, and discourse mode [6].

Within the vocabulary and grammar system of language, elements that carry presupposed meanings can be distinguished, along with the rules for combining them into more complex structures.[14]. Within the academic field, these are defined as vocabulary and grammar [14]. This concept is not limited to linguistics but applies equally to other media such as visual, audio, and tactile. Each medium possesses its unique basic elements and combination rules. From a formal perspective, the analysis focuses on exploring the specific roles of vocabulary and grammar in different media. Moreover, the multimodal discourse analysis framework further pays attention to the interactive relationships between different forms and their combined effects [15]. Zhang Delu categorizes multimodal discourse forms into four types: linguistic, visual, auditory, and tactile. Based on the principle of "whether one modal discourse needs another modal to fully express its meaning," he divides the relationships between multimodal discourse forms into complementary and non-complementary relationships. In complementary relationships, he further subdivides them into reinforcing and non-reinforcing relationships based on whether there is a dominant modality among multiple modalities and whether all communicative modalities are essential. In non-complementary relationships, he subdivides them into overlapping, inclusive, and contextual interaction relationships based on the interrelationships among multiple modalities (as shown in Figure 1).

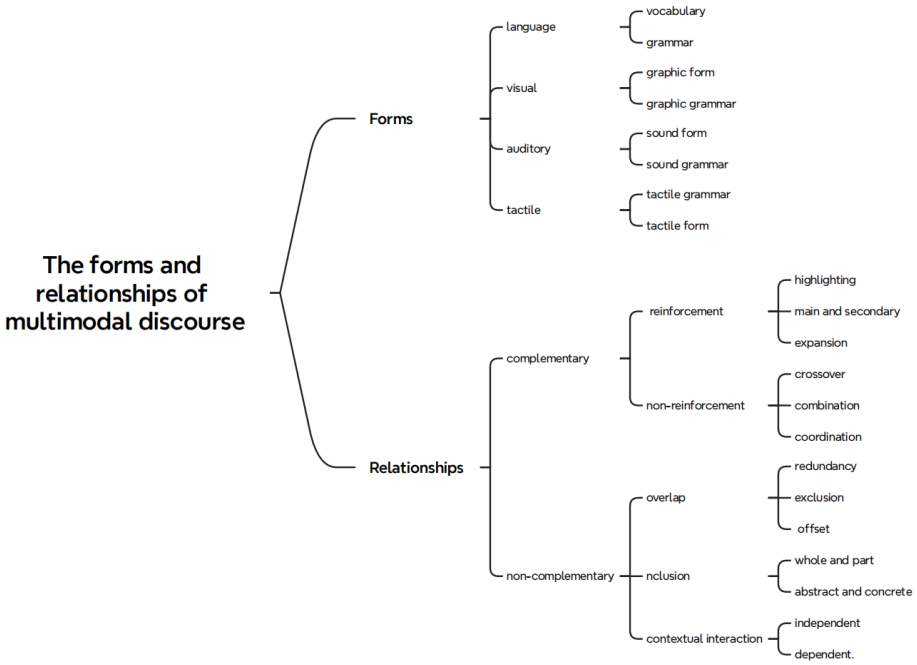


Figure 1: Multimodal Discourse Forms and Relationships by Zhang Delu [6]

DOI: 10.54254/2753-7064/40/20242219

2.2. Identity Theory

Academic discussions on identity mainly focus on two theoretical frameworks: essentialism and constructivism [6]. The essentialist view posits that the formation of identity stems from a common origin, structure, or continuous shared experiences within a specific period, containing inherent, fundamental, and unchanging components [16]. In contrast, constructivism emphasizes that identity is constructed through diverse contexts via intersecting and even opposing discourse practices, always in a state of dynamic change. The focus of knowledge exploration has shifted from "What is the nature of knowledge?" in essentialism to "How is knowledge produced?" in constructivism [17].

By the end of the 20th century, Alexander Wendt established social constructivism as the mainstream theory in the field of international relations with his work "Social Theory of International Politics" [18]. Over the past twenty years, constructivist theory has achieved significant development. Its core concepts—the importance of identity and norms in international relations—have been widely recognized by other theoretical schools [19]. An increasing number of scholars from sociology, social psychology, psychology, communication studies, linguistics, and other fields have adopted the perspective of social constructivism to study how identity is dynamically constructed, negotiated, managed, and communicated in discourse [20]. They have proposed a series of new views on identity and methodologies for analyzing its construction, arguing that identity is not fixed, predetermined, or unidirectional but is dynamically, actively, and online constructed through communication processes [20]. This perspective fundamentally challenges the traditional essentialist view of identity.

This paper explores the issue of identity recognition of Chinese cultural relics on the official website of the British Museum, primarily based on the theory of identity construction proposed by Stuart Hall in 1996 [21]. This theory includes several core points:

1. Identity is not a fixed attribute but an interactive dynamic process. The Foucaultian school argues that an individual's self-identity is "reconciled" into social relations through interaction with external forces and knowledge. Identity is not inherent but gradually formed under the influence of social relations [22]. The formation of identity occurs in specific interactive contexts, depending on concrete situations and contexts [23]. An individual's identity does not exist in isolation but is continuously constructed and reshaped through interactions with others and the social environment.

2. The realization of identity requires discourse [24]. This means that individuals present their identities through language and other forms of expression, which are profoundly influenced by sociocultural backgrounds and power relations.

3. Literature Review

3.1. Current Research Status on Multimodal Discourse Analysis at Home and Abroad

International research on multimodal discourse analysis mainly focuses on theoretical constructions based on M.A.K. Halliday's systemic functional linguistics, such as the studies by O'Toole [25] and Kress [19], which are influenced by Halliday's socio-semiotic theory. Their analysis of multimodal discourse is based on social semiotic analysis grounded in Halliday's functional linguistics; Norris [8] further developed interactional discourse analysis theory based on Scollon's viewpoints [26]. According to Scollon, interactional discourse analysis theory is based on interactional sociolinguistics [26]. Norris [8] further proposed that social interaction is inherently multimodal and emphasized that different modes of communication participate in interactions to varying degrees in specific environments, introducing a new analytical method. Additionally, applications of multimodal discourse analysis are popular. For instance, Emilia Djonov and Zhao Sumin explored discursive expressions in popular culture through multimodal critical analysis [27]; while Linda C.S. Wong focused on multimodal discourse analysis of politics and protest activities in the context of

DOI: 10.54254/2753-7064/40/20242219

digital pop culture [28]. However, research on exploring digital websites through multimodal discourse analysis remains relatively limited, mainly concentrating on website marketing strategy analysis. For example, Katherine Wihsah's study focused on the multimodal analysis of the "girl effect" on sports websites [29], while Vana Koulach and Daniel Laresh-Orbach discussed multimodal symbols as key factors for brand websites to attract online traffic [30].

Domestic research on multimodal discourse analysis mainly concentrates on building theoretical frameworks of multimodal analysis, official image shaping, and English teaching methods. For example, Zhang Delu, Xin Zhiying, and Dai Shulan summarized the comprehensive theoretical framework [31], origins and progress, different schools and current development status [32] of multimodal discourse analysis; Liu Yu and Zhang Hongjun used multimodal discourse analysis to analyze how political documentaries shape national images [33], Huang Dongqun explored the construction of Fujian's image through multimodal discourse analysis [34]; scholars like Zhang Delu [35], Wang Lu [35], and Zhu Yongsheng [36] integrated multimodal discourse analysis thinking into foreign language teaching. Research on using multimodal discourse to analyze digital websites is relatively limited, mainly focusing on Sino-foreign comparisons and official image shaping. For example, Chang Yiyuan applied multimodal comparative analysis to museum websites in China and the USA [37], Zhao Ying and Zhang Xiaohui analyzed economic promotional language on Pudong and Binhai Development Zone websites from a multimodal representation perspective [38].

3.2. Current Research Status on Identity Analysis at Home and Abroad

When analyzing domestic and international research on identity, it can be observed that scholars mainly focus on network identity and national ethnic identity. For example, Pan Shuya and Zhang Yuqi deeply analyzed identity issues exhibited in virtual network fan community interactions [39], Triandafyllidou's work focused on the relationship between national identity and the Other [40], He Jinrui and Yan Jiryong expanded research from mere ethnic identity to national identity [41], Slater's study emphasized the impact of online and offline social relations on identity [42], Triandafyllidou's research proposed the relationship between national identity and the Other [40].

3.3. Current Research Status on Museums and Multimodality, and Museums and Identity Recognition

In the field of museum multimodal analysis and identity recognition, the international academic community mainly focuses on the presentation of specific exhibition themes and the division of museum functions. For example, Miles E. Hollokav explored the use and potential of virtual space on British and American museum websites [5]; Falk discussed effective methods of museum learning from the perspective of identity recognition [43]. In contrast, domestic research focuses more on optimizing the external manifestation of museums and the protection and inheritance of cultural heritage. For example, Liu Meijun and Yu Xiao proposed suggestions for enhancing museum interactive experiences based on multimodal analysis [44]; Laurajane Smith and Zhang Yu focused on critical research on intangible cultural heritage in museums [45].

These research results indicate that there is still relatively little research on confirming the analysis related to cultural relics and museum identity recognition through multimodal discourse analysis. Therefore, this study is necessary and pioneering in exploring this field.

DOI: 10.54254/2753-7064/40/20242219

4. Analysis and Discussion

4.1. Multimodal Discourse Analysis of the British Museum's Website on Chinese Artifacts Cognitive Construction

When analyzing how the British Museum official website utilizes text and images to shape visitors' basic understanding of China and South Asia, the focus is primarily on two core aspects. Firstly, how specific semiotic symbols imbued with meaning are used to construct cognition; secondly, through combining different semiotic symbols and assigning a certain meaning to this combination, thereby utilizing the function of syntax[6]. Additionally, this study also emphasizes the analysis of the interrelatedness between different media forms, particularly how text and images on the website interact to collectively shape visitors' basic understanding and construct identity recognition of Chinese cultural artifacts.

Initially, the official website aids visitors in establishing a preliminary understanding of Chinese cultural artifacts by showcasing specific items such as Ming dynasty blue-and-white porcelain and Tang dynasty tomb figures. According to Halliday's systemic functional grammar theory, language is considered a social symbol system with conceptual, interpersonal, and textual functions. In this context, items like blue-and-white porcelain have been encoded as "cultural symbols" of China throughout history[46]. The dissemination of these symbols helps recipients grasp the ethnic cultural significance behind them[47]. Therefore, when visitors encounter these terms on the website, they can rely on their familiarity with these symbols to establish a connection with the exhibition area without introducing new concepts[47]. By reinforcing visitors' existing social cognition, they are encouraged to construct an imaginative image of Chinese historical culture.

On the official website, displayed images include but are not limited to a set of Tang dynasty tomb figures and a Cloisonne covered jar depicting a dragon from the Ming dynasty. The relationship between these images and textual descriptions forms a coordinated relationship within a non-complementary relationship[6]. In this relationship, the two media forms do not substitute for each other but work together to enhance the effectiveness of information transmission[14]. The non-complementary relationship emphasizes the indispensability of both media forms as complements to each other. For example, in the case of the British Museum's official website, if images were lacking, textual descriptions alone would not fully convey the exhibition's theme since visitors often need specific visual information to aid their understanding. Conversely, without textual explanations, visitors unfamiliar with the cultural background of the items may feel confused. Therefore, the complementarity of text and images lies in their ability to collaborate, assisting visitors in constructing a holistic understanding of specific historical cultures in the exhibition area through cross-modal means[8].

Furthermore, based on the foundational cognitive constructions of China and South Asia, the official website strategically combines specific semiotic symbols to create a parallel relationship between visitors' cognition of China and South Asia. This process not only facilitates a profound understanding of each but also contributes to forming a holistic understanding of Asia and the Orient[48]. For instance, in the initial introduction on the website, it mentions that half of the gallery showcases Chinese art and material culture from 5000 BC to the present, while the other half displays the history of South Asia from early human occupation to the present by chronological order and region. Consequently, visitors begin to map their impression of Asia from these two perspectives, avoiding fragmented understanding and instead forming a holistic cognition of Asia and even the Orient. Illustrations ranging from the Sitar of India, exquisite Tara Goddess statue of Sri Lanka to the aforementioned Ming dynasty Cloisonne ware not only serve the cultural image construction of China and South Asia through a coordinated relationship in a non-complementary manner but also form a complementary relationship through combining media to serve the holistic image construction

DOI: 10.54254/2753-7064/40/20242219

of Asian culture and even the Orient[6]. However, simultaneously, this weakens the identity recognition of Chinese cultural artifacts.

Whether through directly assigning meaning to semiotic symbols or through combining to reinforce the overall impression, the British Museum's official website cleverly employs text and images to intentionally guide visitors beyond the discourse space into a specific spatial area, blurring the origins of Chinese cultural artifacts' identity and thereby reconstructing the basic identity cognition of that region.

4.2. Multimodal Discourse Analysis of the British Museum's Website Self-Cognitive Construction

This paper adopts the cultural and contextual levels of multimodal discourse analysis to analyze how the British Museum's official website uses text and images to construct visitors' reasonable cognition of Chinese artifacts in the museum. At the cultural level, the key to realizing multimodal communication lies in being influenced by ideology and genre [8]. At the contextual level, the communication process is situated in a specific situational context, where communicators make choices about meaning, thus forming the generation process of discourse [6].

The cultural context presented on the British Museum's official website reflects the changing self-definition of global museums [49]. The specific situational contextualization process refers to visitors gradually developing cognition and identification with Chinese artifacts and their underlying culture through browsing the website [50]. For instance, upon visiting the "China and South Asia" section of the official website, the first image presented (as shown in Figure 2) depicts an adult woman pointing at a glass display case in an exhibition scene, speaking to a young girl beside her. Based on this scene, it can be reasonably inferred that the woman might be a mother visiting the museum with her daughter and explaining to help her understand the exhibition content. From the audience's perspective, when accessing an online platform introducing foreign cultures, immediate contact with information about the museum's educational role effectively enhances public awareness of the museum's educational function [51]. Similarly, in showcasing Chinese artifacts, introducing viewpoints from international critics (non-Chinese) introduces a cross-cultural symbol system, tapping into the potential of universal symbolic meaning, thereby guiding audiences towards a standardized interpretation of symbolic meaning [50]. Moreover, the official website cleverly interconnects these symbols, thus constructing a complex multimodal discourse symbol structure [8]. In this structure, symbols are manifested through different media, and the official website utilizes text and images to enhance the potential meaning of these symbols, thereby generating a phenomenon of multimedia interaction [52].

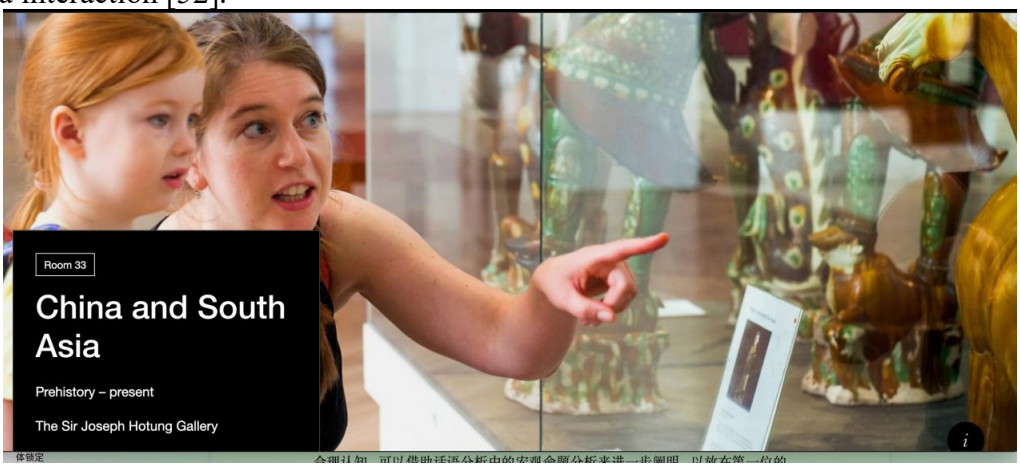


Figure 2: Screenshot of the official website of The British Museum

DOI: 10.54254/2753-7064/40/20242219

To further analyze how the official website of The British Museum constructs visitors' reasonable cognition of Chinese artifacts in the museum, macro-proposition analysis from discourse analysis can be used to elucidate. Taking the top jump link, "Exploring the Silk Roads," as the specific object of analysis:

Theme: Exploring the Silk Roads

Macro-proposition M1: Introduction to the Silk Roads

Proposition P1.1: Definition of the Silk Roads

Proposition P1.2: The connection between the Silk Roads and the world

Proposition P1.3: The situation in China at the time

Macro-proposition M2: How the world discovered the Silk Roads

Proposition P2.1: Multinational archaeological expedition teams went to explore northwest China

Proposition P2.2: Introduction to one of the representative figures, the Budapest archaeologist Marc Aurel Stein

Proposition P2.3: An overview of Stein's collection

Macro-proposition M3: Representative artifacts of the Silk Roads

Proposition P3.1: The Dunhuang manuscript cave discovered by Stein

Proposition P3.2: Other artifacts discovered by Stein

Macro-proposition M4: The British Museum's exhibition of Silk Road artifacts

Proposition P4.1: Display of Stein's collection

Proposition P4.2: Bequest of Stein's collection

The text content of the "Exploring the Silk Roads" special page is divided into three categories: Macro-proposition M1: Introduction to the Silk Roads, Macro-proposition M2: How the world discovered the Silk Roads, Macro-proposition M3: Representative artifacts of the Silk Roads, and Macro-proposition M4: The British Museum's exhibition of Silk Road artifacts involves handling these macro-propositions through three main macro-rules: Deletion, Generalization, and Construction [53]. Through these rules, key information is extracted from the text to arrive at the theme. The four macro-propositions of the special page delete the historical origins and cultural connotations of the Silk Road artifacts in China, instead generally emphasizing the connection between the Silk Roads and the world, thereby constructing a direct link between Chinese artifacts and the Western world, indirectly establishing a direct link between the artifacts and The British Museum.

4.3. Analysis of the construction of identity for Chinese artifacts on the official website of The British Museum

Consistent with the approach of multimodal analysis, the construction of identity can also be developed from two aspects: one is how Chinese artifacts themselves construct identity through the official website, and the other is how The British Museum constructs the identity of the artifacts through its official website.

From the perspective of constructivism of identity, identity is interwoven and constructed among intersecting and even opposing discourses in different contexts, while also being shaped and continuously influenced by social environments [54]. Unlike "essentialism," which views identity as relatively fixed natural characteristics of people or societies, constructivism considers identity not as fixed traits nor as static products, but as an ongoing process [55]. When Chinese artifacts become part of an exhibition at The British Museum, their original identity gradually fades with transnational exhibition, while an identity associated with The British Museum is reinforced. For example, taking the Ming Dynasty Jingtai period blue-and-white dragon pattern jar as an example, as a relic from the Xuande period of the Ming Dynasty in China, if viewed from the essentialist perspective of identity, its intrinsic core belongs to Chinese historical relics. However, when this artifact appears in a British

DOI: 10.54254/2753-7064/40/20242219

museum, it may confuse viewers. To address this issue, The British Museum's official website places each artifact in the Chinese section under the larger theme of "China and South Asia," whether by assigning meaning through symbols or by strengthening the overall impression through combinations, The British Museum's website skillfully uses text and images to effectively guide visitors into a specific regional space, thereby establishing basic cognition of that area. Once visitors establish cognition of the "China and South Asia" region, Chinese artifacts within the exhibition area are merely part of a collective, where the focus of identity in specific contexts lies on the exhibit rather than the original identity of the artifacts, thus preliminarily constructing the identity of Chinese artifacts at The British Museum.

4.4. Analysis of the construction of identity for Chinese artifacts on the official website of The British Museum

The constructivist perspective on identity further proposes that identity needs to be realized through discourse. In situations like The British Museum, which accommodates numerous artifacts from other ethnicities, the museum's own identity needs to be reshaped through discourse [56]. Shen Ning summarized the changes in the museum's own definition in the "post-museum" era [57]: during the Renaissance, Alexander's model of collecting war trophies became the prototype of museums, aimed at establishing a sacred paradigm for redeeming the past and becoming the mainstream thought in Europe. This Alexandrian paradigm laid the foundation for the legitimacy of modern museums [58]. In the post-colonial period after World War II, ideas and economy replaced warfare as new means of control [58]. When the International Council of Museums was established in 1946, it defined museums, clarifying their form and functions; over time, the definition of museums has been continuously revised, mainly including collections, exhibition displays, research, and education. In 2019, Ms. Jette Sandahl, Chairperson of the Standing Committee of ICOM, pointed out that the current definition of museums no longer represents the voice of the 21st century and needs to be redefined historically, contextually, and decolonially [59]. The British Museum's official website emphasizes its educational significance and a decolonized, borderless universal significance through text and images [57]. This approach strengthens the close connection between Chinese cultural artifacts and other items with evident colonial undertones to the British Museum, while weakening their own inherent identity recognition.

5. Conclusion

This study selected the "China and South Asia" page from the official website of the British Museum to explore how museums use online platforms to enhance public outreach in the internet era. Through multimodal discourse analysis, this paper conducted an in-depth analysis of the text and images on the website, revealing how the British Museum presents Chinese artifacts. At the same time, through the constructivist perspective of identity theory, this paper explains the strategies used by the website to construct a new identity for Chinese artifacts. Overall, on the official website, the British Museum's identity recognition of Chinese artifacts seems relatively forced, clearly there is still a long way to go. To improve this situation, several measures could be considered. For example, by establishing cooperative relationships with museums in the countries of origin of cultural artifacts, maintaining a close connection between artifacts and their original cultures; official websites can also use images, videos, and other means to showcase the significance of artifacts in their source cultures and their migratory paths, achieving identity recognition construction from the perspectives of awakening cultural memory, stimulating cultural emotions, and highlighting cultural values. This will be more conducive to the effective inheritance of cultural heritage.

DOI: 10.54254/2753-7064/40/20242219

References

[1] Duthie E. The British Museum: an imperial museum in a post-imperial world[J]. Public History Review, 2011, 18: 12-25.

[2] Abungu, George Okello. 2022. Victims or victors: Universal museums and the debate on return and restitution, Africa's perspective. In The Oxford Handbook of Museum Archaeology. Edited by Alice Stevenson. Oxford: Oxford University Press, pp. 271–88.

[3] Fincham, Derek. 2012. The Parthenon Sculptures and Cultural Justice. Fordham Intellectual Property, Media & Entertainment Law Journal 23: 1–74.

[4] Wan Y N. Graduation Resources in News Discourse: Calls for the British Museum to Return Chinese Cultural Artefacts[J]. Journalism and Media, 2024, 5(1): 189-202.

[5] Miles E. Holocaust Exhibitions On-Line: An Exploration of the Use and Potential of Virtual Space in British and American Museum Websites[J]. The Journal of Holocaust Education, 2001, 10(2): 79-99.

[6] Zhang Delu. Exploring a Comprehensive Theoretical Framework for Multimodal Discourse Analysis. Chinese Foreign Language, 2009 (1): 24-30.

[7] Alivizatou M. Museums and intangible heritage: The dynamics of an'unconventional'relationship[J]. Papers from the Institute of Archaeology, 2006, 17.

[8] Norris, S. 2004. Analysing Multimodal Interaction: A Methodological Framework. New York: Routledge.

[9] Kress, G. & T. van Leeuwen. 2006. Reading Images: The Grammar of Visual Design. London: Routledge.

[10] Halliday, M.A.K. An Introduction to Functional Grammar. London: Edward Arnold, 1994, pp. F 39-57.

[11] Martin, J.R. English Text: System and Structure [M]. Amsterdam: John Benjamins, 1992.

[12] O'Halloran K L. Multimodal discourse analysis[J]. The Bloomsbury handbook of discourse analysis, 2011: 249-282.

[13] Xin Zhiying. New Developments in Discourse Analysis - Multimodal Discourse Analysis. Journal of Social Sciences, 2018 (5): 208-211.

[14] Machin D. What is multimodal critical discourse studies?[J]. Critical discourse studies, 2013, 10(4): 347-355.

[15] Jones R H. Multimodal discourse analysis[J]. The encyclopedia of applied linguistics, 2012: 1-6.

[16] Lawler, S. (2008). Identity: Sociological Perspectives, Cambridge: Polity Press.

[17] Garfinkel, H. (1967). Studies in ethnomethodology, Englewood Cliffs: Prentice-Hall.

[18] Wendt A. Social theory of international politics[M]. Cambridge university press, 1999.

[19] Amineh R J, Asl H D. Review of constructivism and social constructivism[J]. Journal of social sciences, literature and languages, 2015, 1(1): 9-16.

[20] Kim B. Social constructivism[J]. Emerging perspectives on learning, tea

[21] Grossberg L, Hall S, Du Gay P. Questions of cultural identity[J]. Identity and Cultural Studies: Is that all there is, 1996: 87-107.

[22] Fairclough, N. (2006). Language and globalization London: Routledge.

[23] Chen Xinren. Identity Research from a Pragmatic Perspective - Key Issues and Main Paths. Modern Foreign Languages, 2014, 37(5): 702-710.

[24] Ainsworth S, Hardy C. Critical discourse analysis and identity: Why bother?[J]. Critical discourse studies, 2004, 1(2): 225-259.

[25] O'Toole, M. The Language of Displayed Art. London: Leicester University Press, 1994, pp. 8-20. Kress, G. & van Leeuwen, T. Reading Images: The Grammar of Visual Images. London: Routledge, 1996, pp. 1, 14, 17.

[26] Scollon , R. and S.W.Scollon. , Discourse in Place :Language in the Materia l World , London: Routledge, 2003 , pp.3-38.

[27] Djonov E, Zhao S. From multimodal to critical multimodal studies through popular discourse[M]//Critical multimodal studies of popular discourse. Routledge, 2013: 13-26.

[28] Way, L. Analysing Politics and Protest in Digital Popular Culture: A Multimodal Introduction. 2020.

[29] Vihersalo K. Agency in the Girl Effect campaign website: a multimodal discourse analytic study[D]. , 2012.

[30] Culache O, Obadă D R. Multimodality as a premise for inducing online flow on a brand website: a social semiotic approach[J]. Procedia-Social and Behavioral Sciences, 2014, 149: 261-268.

[31] Feng Dezhen, Zhang Delu, O'Halloran K. Advances and Frontiers in Multimodal Discourse Analysis. Contemporary Linguistics, 2014, 16(1): 88-99.

[32] Dai Shulan. The Origin and Progress of Multimodal Discourse Research. Journal of Foreign Languages, 2013 (2): 17-23.

[33] Liu Yu, Zhang Hongjun. Multimodal Discourse Analysis of Political Documentary Films Shaping National Image. Modern Communication: Journal of Communication University of China, 2018 (9): 118-122.

[34] Huang Dongqun. Study on the Construction of Fujian Image from the Perspective of Multimodal Discourse Analysis. Journal of Zhangzhou Vocational and Technical College, 2022, 24(3): 64-71.

[35] Zhang Delu, Wang Lu. Synergy of Modalities in Multimodal Discourse and Its Manifestation in Foreign Language Teaching. Journal of Foreign Languages, 2010 (2): 97-102.
[36] Zhu Yongsheng. Theoretical Foundation and Research Methods of Multimodal Discourse Analysis. Journal of Foreign Languages, 2007 (5): 82-86.
[37] Chang Yiyuan. A Comparative Analysis of Multimodal Features in English and Chinese Websites - A Case Study of Museum Websites in China and the United States. Ningbo University, 2011.
[38] Zhao Ying, Zhang Xiaohui. Multimodal Representation of Social Participants in Economic Propaganda Discourse - A Case Study of Pudong and Binhai Development Zone Websites. Journal of East China Jiaotong University, 2011, 28(06): 108-113.
[39] Pan Shuya, Zhang Yuqi. Virtual Presence: The Ritual Chain of Interaction in Online Fan Communities. International Journalism, 2014, 36(09): 35-46. DOI: 10.13495/j.cnki.cjjc.2014.09.003.
[40] Triandafyllidou A. National identity and the 'other'[J]. Ethnic and racial studies, 1998, 21(4): 593-612.
[41] He Jinrui, Yan Jirong. On the Transition from Ethnic Identity to National Identity. Journal of Minzu University of China (Philosophy and Social Sciences Edition), 2008, (03): 5-12. DOI: 10.15970/j.cnki.1005-8575.2008.03.006.
[42] Slater D. Social relationships and identity online and offline[J]. Handbook of new media: Social shaping and consequences of ICTs, 2002: 533-546.
[43] Falk J H. An identity-centered approach to understanding museum learning[J]. Curator: The museum journal, 2006, 49(2): 151-166.
[44] Liu Meijun, Yu Xiao. Perception and Interaction: Enhancing the Interactive Experience in Museums. Furniture and Interior Decoration, 2022, 29(03): 61-65. DOI: 10.16771/j.cn43-1247/ts.2022.03.013.
[45] Laura Jane Smith, Zhang Yu. The Essence of Heritage is Essentially Intangible: Critical Studies on Heritage and Museum Research. Cultural Heritage, 2018, (03): 62-71.
[46] Miller C L, Hamell G R. A new perspective on Indian-White contact: Cultural symbols and colonial trade[J]. The Journal of American History, 1986, 73(2): 311-328.
[47] Pattee H H. Physical and functional conditions for symbols, codes, and languages[J]. Biosemiotics, 2008, 1: 147-168.
[48] Chkheidze, P., Tho, H. T., & Pas'ko, I. (Eds.). (2015). Symbols in Cultures and Identities in a Time of Global Interchange. Council for Research in Values and Philosophy.
[49] Lagerkvist C. The Museum of World Culture: A "glocal" museum of a new kind[J]. Scandinavian museums and cultural diversity, 2008: 89-100.
[50] Halliday M A K. Language and Education: Volume 9[M]. A&C Black, 2007.
[51] Earle W. Cultural education: Redefining the role of museums in the 21st century[J]. Sociology Compass, 2013, 7(7): 533-546.
[52] Waterworth J A. Multimedia interaction [M] // Handbook of Human-Computer Interaction. North-Holland, 1997: 915-946.
[53] Van Dijk, translated by Zeng Qingxiang. News as Discourse. Beijing: Huaxia Publishing House, 2003.
[54] Fairclough N. Critical discourse analysis: The critical study of language[M]. Routledge, 2013.
[55] Antaki, Charles, and Sue Widdicombe, eds. Identities in talk. Sage, 1998.
[56] Weber C J. Ainsworth and Thomas Hardy[J]. The Review of English Studies, 1941, 17(66): 193-200.
[57] Shen Ning. Contemporary Paths to Community Building: An Analysis from the Perspectives of Museum Identity and Memory. The Editorial Department of Journal of Ethnology, 2021, 12(6): 68-76, 123.
[58] Shen Ning. The Journey of Museums from Temples to the Secular: The British National Museum Institute. China Museums, 2016 (4): 43-48.
[59] Sandahl J. The museum definition as the backbone of ICOM[J]. Museum International, 2019, 71(1-2): vi-9.

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242240

Japan's Lost Thirty Years: From Post-War Miracle to Bursting Bubble

Runze Dong[1,a,*]

[1]*University of Sydney, Faculty of Arts and Social Sciences, Camperdown, NSW, 2006, Australia*
a. qq1411963863@gmail.com
**corresponding author*

Abstract: Japan has achieved remarkable economic success since the 1950s, and there are consequences when Japan grows too fast, even up to a certain point. The signing of the Plaza Accord was the decisive factor in determining Japan's future economic destiny, but the Japanese at that time only focused on the growth of the exchange rate and ignored their own policy mistakes. The Japanese government even thought it was a "godsend" at one time that year, and the yen's exchange rate began to be seriously overvalued. At the same time, this also led to Japan's industrial hollowing out. Here, it could be argued that Japan signed the agreement in the mistaken belief that the economy would be great in the future. Therefore, this paper discusses whether the Plaza Accord was a determinant of Japan's economic growth between the post-war period and the bursting of the bubble by analyzing the impact of the three major industries, the yen exchange rate and the central bank interest rate, as well as consumption on GDP. It can be concluded from the analysis that the Plaza Accord was only a trigger, and Japan had an interest rate policy blunder and an overly-rapid exchange rate appreciation in those years. Therefore, the policy blunder was the main reason that pushed Japan into the abyss. From Japan's experience, for the rest of Asia, it is important not only to insist on policy independence but also to avoid the hollowing out of high-precision industries.

Keywords: Post-War, Plaza Accord, Bubble Economy, Finance, Three Main Industries.

1. Introduction

In the decades following the end of the Second World War, the Japanese economy has been a subject of study worth exploring. Beginning in the 1950s, Japan became the first country in East Asia to embark on an economic recovery. During those decades, with the assistance of the United States and Japan's regulation, it created an economic miracle that enabled it to leapfrog to the status of a developed country and to become the world's second-largest economy in the last century. In addition, Japan did experience faster overall economic growth from the 1950s through the 1980s, before the Plaza Accord, with increases in GDP, employment, and other areas. However, in the long run, the economic growth brought to Japan by the U.S. was often a double-edged sword. In the 1980s, Japan signed the Plaza Accord with the United States, and since then, in the 1990s, Japan's economy has taken a different turn. During that period, a bubble economy emerged in Japan, which burst, and the economic situation was not optimistic. So far, Japan's economy has grown slowly, moving from the world's second-largest economy to the world's third largest. Is it possible that the signing of the Plaza Accord has led to such a drastic change in Japan's economic growth? The following three sections in

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242240

this paper describes Japan's economic growth and its turning points and based on this, the three major industries, the share of consumption in GDP , and why the United States approached Japan for the Plaza Accord. The final section will discuss the lessons to be learnt by summarizing Japan's economic development.

2. Literature Review

2.1. Korean War & Post-War Economic Growth

In the 1950s, the United States led the United Nations forces in the Korean War. During this period, the United States began to buy strategic materials in Japan, and the Korean War was the beginning of Japan's post-war economic growth. It was even considered a boon to the Japanese economy. A bank president at the time surmised that the United States would invest a lot of military spending in Japan during the war, and the Tokyo stock market also saw unexpected growth at the time, which made the Japanese begin to be optimistic about economic recovery. Statistics showed that during the outbreak of the Korean War, Japan's average annual GDP growth began to exceed 10%, the industrial index rose to 142, and industrial output increased by 50%. At that time, the United States spent nearly $3 billion on Japanese war materials and services, which fully confirmed Dingman's suspicion that the Korean War was an economic gift to Japan. And in one country, that amount of money was equivalent to 60% of the US investment in non-war countries, along with increased employment. William Borden also argues that the Korean War was a decisive event in the revival and repositioning of Japanese trade. With this growth, Japan became economically dependent on the United States [1].

After the end of the Korean War, Japan began to create a post-war economic miracle. This could not be separated from the fact that Japan's policies back then influenced the economy, and by 1954, Japan's policy of developing the manufacturing sector was a huge success. Studies have shown that the core of Japan's success was mainly the economic reforms that tilted the mode of production (the production of raw materials) and used it to produce final products. Then there was the fact that Japan started recruiting female employees, which increased the overall participation rate and added enough labor for production. Japan's income doubling program and the Basic Law for Agriculture, introduced between 1961 and 1970, were also successful. By 1970, Japan's real GDP growth rate had reached 11.6%, and the former was also responsible for increasing per capita labor output, while the latter improved overall efficiency [2]. From 1955 to 1971, there was an increase in employment but a slower increase in the labor index. And during this period, the factors of production, i.e., capital and intermediate goods, became the source of Japan's economic growth. In addition to manufacturing, productivity changes in agriculture, forestry, fisheries, and mining were the dominant factors, while the contribution of water, electricity, gas, transport, trade, and services was low, and even the contribution of finance, real estate, and construction was almost nil. In the estimation of real products, it may be the size of the field that is the problem [3]. Through Japan's post-war economic miracle, although there was the fact that Japan had US aid and then developed policies for economic growth, it also indirectly showed that Japan would be economically dependent on the US, as just stated. However, the help brought by the United States was not long-lasting growth, which would be like a dagger in the core of Japan's economy.

2.2. Plaza Accord & Bubble Economy

In the 1980s, the fiscal deficit of the United States widened, and an attempt was then made to reduce it by devaluing the US dollar. As a result, the United States got Japan to sign an agreement with it at the Plaza Hotel, and this was the Plaza Accord. Germany signed the Plaza Accord as well, but Germany did not experience the economic decline that Japan did in the 1990s. The U.S. signed the Plaza Accord with Japan because Japan's post-war growth was rapid, and its purchasing power parity

DOI: 10.54254/2753-7064/40/20242240

far exceeded that of the United States. Therefore, the US had to deal with its deficits while at the same time preventing Japan from continuing to grow [4]. After the Plaza Accord, the exchange rate of the yen began to appreciate rapidly; before that, 240 yen could only be exchanged for 1 US dollar, but after that , 1 US dollar could be exchanged for 216 yen. It can be shown that the yen appreciated by 10 % at that time, and by the end of 1985, 200 yen could be exchanged for 1 dollar, and this situation has continued. Even to the back, the yen exchange rate breaks through 190 yen per dollar, while the Bank of Japan is intervening in reverse at this time, the Bank of Japan began to cut interest rates [5]. Some people believe that the Plaza Accord is a conspiracy theory, and the reason for this may be related to the economic situation that emerged in Japan after the Plaza Accord. As a result, it is believed that the United States destroyed the Japanese economy. During the period 1987-1989, Japan saw the advent of the bubble economy [6].

During the bubble economy, Japan's total bank loans increased from 135 trillion to 376 trillion yen, while the nominal GDP growth rate was maintained at around 5%. Even between 1981 and 1985, credit in Japan increased by about 26 trillion yen. And between 1986 and 1990, it increased by an annual average of 46 trillion yen. The ratio of total bank loans to GDP is even more incomprehensible. This situation led to a surge in land prices in Japan, and stock prices also rose by a large margin. This was a serious problem of internal and external imbalance, but the Japanese government, having identified this problem, believed that financial liberalization could regulate it. At that time, Japan had a floating exchange rate system. As a result, instead of adopting macroprudential financial regulation, Japan adopted an accommodative monetary policy [7]. If coupled with the interest rate cuts mentioned earlier, it would probably have led to the bursting of the Japanese bubble in the 1990s. Base money began to rise sharply in the 1990s with the use of easy monetary policy and in the aftermath of the Japanese bubble economy. This was because monetary policy in Japan began to tighten relatively, and the Bank of Japan attempted to burst the bubble [8]. However, the bursting of the Japanese bubble economy was followed by massive bank failures and a sustained fall in land prices, coupled with a decline in the effectiveness of Japan's fiscal policy, an aging population, and a shift in budgetary spending from the central government to local governments. This also led to overcapacity in Japan, which led to a slowdown in technological development, and a high exchange rate that caused some profitable companies to leave Japan, which also led to a reduction in domestic production. As a result, it will be difficult for the Japanese economy to rebound for decades [9].

The U.S. prompting Japan to sign the Plaza Accord can be considered a reason. Still, the main thing is the economic activities of the Japanese government after the signing of the Plaza Accord. Japan's excessive dependence on the US will only result in its inability to compete with the US in terms of policy after the bubble bursts and its inability to break away from the US economically. Therefore, taking the above studies together, there is still insufficient evidence to prove that the Plaza Accord was the direct cause of Japan's economic recession after the 1990s.

3. Methodology

3.1. Data

As to whether the Plaza Accord was the main reason for the slow growth of the Japanese economy, it is possible to obtain a relatively satisfactory result by examining the data related to finance, the three major industries, agriculture, forestry, fisheries, and consumption during that period. However, by referring to the relationship between finance and economic growth and the impact of manufacturing among the three major industries on growth, the data and analysis results may not be very practical for Japan's economic situation [10]. This is because, after the Plaza Accord in the last century, Japan did not necessarily start in the financial world with the yen exchange rate and bank interest rates falling. As for the manufacturing industry, although it is said that Japan reformed the

DOI: 10.54254/2753-7064/40/20242240

manufacturing industry after the war, it cannot be said that the situation of the manufacturing industry turned sharply downward during the 1990s. Therefore, it may be for developing countries, while developed countries like Japan need to consider other factors [11].

This study searched the CEIC Database for data related to Japan's GDP, central bank interest rate, exchange rate, three major industries, and consumption. By consolidating the data, some relevant line graphs as well as pie charts were produced. Among them, the line graphs were studied to identify the annual growth trend of the exchange rate and bank rate concerning the GDP year. The graphs were also used to derive whether the growth was in line with the growth of GDP and focused on observing the situation after the 1980s. Next, for the three major industries, the main study is on their share of GDP. At the same time, some pie charts are produced for further study. The main purpose of this dominance is to determine which of the three major industries dominates the GDP. By looking at the three major industries, it is possible to determine which industry Japan excelled in at that time and to explain why. Finally, Japanese consumption data is still examined through line graphs. This panel focuses on consumption and GDP to see if GDP is also affected by consumption.

3.2. Results

Figure 1 shows the growth trend between the exchange rate and GDP, where the growth of the exchange rate was accompanied by GDP growth. This indicates that the exchange rate continued to grow before and after the Plaza Accord and peaked in 1995. After that, although there was still growth, it could no longer reach its peak.

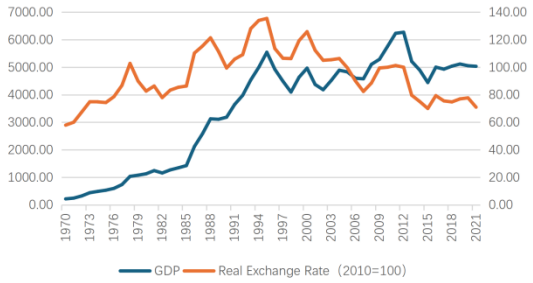


Figure 1: Trend of exchange rate and GDP

In the decades following the bubble economy of the 1990s, although it is said that there were fluctuations at that time, it is not enough to show that the Plaza Accord led to a serious decline in the exchange rate and GDP. Turning now to bank interest rates, they were still rising in the early 1990s but only peaked again in 1990. After that, they rarely peaked and kept falling. While GDP was still growing in the mid- to late 1990s, interest rates have been falling almost continuously. This can be seen in the trend of interest rates and GDP shown in Figure 2. Through the different scenarios of interest rates and exchange rates, it is easy to see that after the signing of the agreement, Japan saw that the exchange rate had been growing, but the Japanese government at that time did not take any measures to cope with the rising exchange rate, and it was only when the exchange rate of the Japanese yen had risen to an unfathomable level that Japan continued to adopt the loose monetary policy, which led to a policy blunder. It was this mistake, coupled with the Japanese government's belief that the continued rise in the exchange rate was a good thing, that led Japan to allow its companies to buy large amounts of overseas assets. If Japanese companies do not invest enough, the government will cut interest rates. However, the decline in interest rates may also be due to the emergence of a bubble after Japanese companies bought in large quantities, and the funds from Japanese companies' overseas investments during this period cannot be recovered. As mentioned earlier, although Japan tried to tighten policy during the bubble economy, it had little effect.

DOI: 10.54254/2753-7064/40/20242240

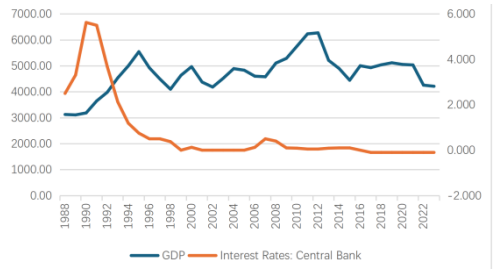


Figure 2: Trend of interest rate and GDP

Figure 3-5 examines the share of manufacturing, services, agriculture, forestry and fisheries in GDP. This section is mainly needed to show which of the three major industries has been growing and which has been less important before and after the Plaza Accord. In three different years, Japan's service sector has been at the forefront of GDP, while manufacturing, agriculture, forestry and fisheries have not been as significant. As a result, after Japan signed the Plaza Accord, many large Japanese companies moved their factories out of the country. This has led to the fact that the factories of the large enterprises mentioned earlier are no longer on the mainland, while the banks are reluctant to give loans to small-scale producers who remain on the mainland. This has led to a hollowing out of industry in Japan, and the contribution of the service sector has exceeded that of manufacturing. This led to the gradual de-industrialization of Japan, which could only be engaged in the service sectors [12].

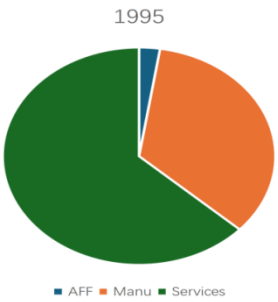


Figure 3: Shares of three major industries in GDP in 1995

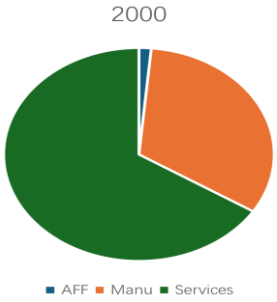


Figure 4: Shares of three major industries in GDP in 2000

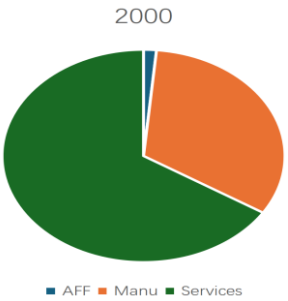


Figure 5: Shares of three major industries in GDP in 2012

Figure 6 shows the growth trend of consumption and GDP, which are components of GDP. GDP is also growing with the increase in consumption. Consumption increased in 1994 and 1995 and peaked in 2011-2012. However, it fluctuated a lot after 2012 and barely grew. In the late 1990s and early 2000s, Japan's economic bubble burst. After the agreement was signed, Japan encouraged its citizens to buy many properties overseas, which were rarely repossessed by the seller's country,

DOI: 10.54254/2753-7064/40/20242240

resulting in a break in the capital chain of Japan, which is almost the same as the situation in Figure 2, basically no return on investment.

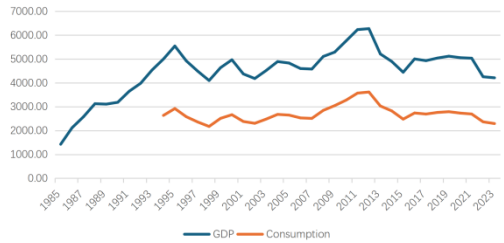


Figure 6: Trends of Consumption and GDP

4. Conclusion

It took Japan thirty years to experience economic recovery and decline, Japan's erroneous economic behavior and monetary policy gave Japan a weighty lesson. Japan's loose monetary policy and constant interest rate cuts in the purchase of overseas assets caused the Japanese bubble to burst. This is completely different from the situation in Germany, which kept raising interest rates after signing to save itself from being like Japan. Therefore, Japan's experience shows that you should never do the opposite in the policies. The bursting of the Japanese economic bubble in the 1990s made it almost impossible for Japan to regulate itself for three decades, and Japan lost three decades of opportunity for economic development, which came to be known as Japan's Lost Thirty Years. This has brought some warnings to other Asian countries. Firstly, they should not think that the gifts of others can help them develop in the long run. They should maintain good economic independence and should not rely on others. Secondly, after signing the agreement, one should not make a policy mistake if one sees that one's exchange rate has risen to an incomprehensible level. Thirdly, it does not lead to the hollowing out of industries. Many profitable enterprises in Japan have relocated their factories out of Japan, resulting in the proportion of industry in GDP being too low. Lastly, it is important not to over-buy overseas assets, which may result in the money invested not being recovered in the first place, which is why the Japanese economy has seen the bursting of the property bubble because this leads to non-performing loans and financial instability. In addition to the above, Japan needs to empower banks to be willing to lend to small businesses that stay in their home countries, which could provide some relative relief from the hollowing out of the industry. The future state of the Japanese economy remains worrying, and it will take a long time for Japan to resolve the trauma caused by the bursting of the bubble economy. If Japan were to repeat the mistakes of the previous century, it would only be a matter of time before there was a second bubble in a few years.

References

[1] *Dingman, R. (1993) The Dagger and the Gift: The Impact of the Korean War on Japan. Journal of American-East Asian Relations, 2(1), 29–55. doi:10.1163/187656193x00077.*

[2] *Tongye Wang. (2021) Analysis on the Influential Factors of Japanese Economy. 2020 2nd International Academic Exchange Conference on Science and Technology Innovation (IAECST 2020), 27 January, pp.4.*

[3] *Nishimizu, M., & Hulten, C. R. (1978) The Sources of Japanese Economic Growth: 1955-71. The Review of Economics and Statistics. 60(3), 351. doi:10.2307/1924160*

[4] *Ken Dow. (2020) How the Plaza Accord helped the US destroy the Japanese economy and how the US is doing it again to China. https://kendawg.medium.com/how-the-plaza-accord-helped-the-us-destroy-the-japanese-economy-b4b24c20a9af*

[5] *Ito, Takatoshi. (2015) The Plaza Agreement and Japan: Reflection on the 30th year Anniversary. https://www.bakerinstitute.org/research/plaza-agreement-and-japan-reflection-30th-year-anniversary*

[6] *Jeffrey Frankel. (2015) The Plaza Accord, 30 Years Later, December, Working Paper 21813.*

DOI: 10.54254/2753-7064/40/20242240

[7] *Kang, M. (2017) The Confidence Trap: Japan's Past Bubble and China's Recent Bubble. New Political Economy, 23(1), 1–26. doi:10.1080/13563467.2017.1321626*

[8] *Dekle, R., & Hamada, K. (2015). Japanese monetary policy and international spillovers. Journal of International Money and Finance, 52, 175–199.*

[9] *Yoshino, N., & Taghizadeh-Hesary, F. (2016) Causes and Remedies of the Japan's Long-lasting Recession: Lessons for China. China & World Economy, 24(2), 23–47.*

[10] *Roubini, N., & Sala-i-Martin, X. (1992). Financial repression and economic growth. Journal of Development Economics, 39(1), 5–30. doi:10.1016/0304-3878(92)90055-e.*

[11] *Szirmai, A., & Verspagen, B. (2015). Manufacturing and economic growth in developing countries, 1950–2005. Structural Change and Economic Dynamics, 34, 46–59.*

[12] *Lee, J.W., & McKibbin, W. J. (2018) Service sector productivity and economic growth in Asia. Economic Modelling. doi:10.1016/j.econmod.2018.05.018.*

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242213

Network Practice of Rare Disease Bloggers and Life Narrative: Take ALS as an Example

Jiaxin An[1,a,*]

[1]*Institute of Literacy and Journalism, Sichuan University,West Port Street, Chengdu, China*
a. ajx5110@163.com
**corresponding author*

Abstract: As a healing method, narrative is widely concerned by the medical community. The characteristics of "Hyper-temporal", "sharing" and "personalized" of new media provide convenient conditions for the self-performance of rare disease groups and also encourage them to re-choose narrative content and strategies. This paper adopts in-depth interview and text analysis to analyze the network practice and narrative behavior of Amyotrophic lateral sclerosis (ALS) web celebrities. The study found that the online narrative of ALS is not only the life practice of bloggers' self-healing, self-persuasion and self-empowerment, but also their positive response to real family and social responsibilities. At the same time, the online celebrity career of rare disease bloggers reflects their life courses in a certain sense. The social media accounts of rare disease bloggers are an important carrier for them to enrich themselves and place their feelings and expectations, and the continuation of their digital life has brought new philosophical and ethical thinking.

Keywords: rare disease, web celebrity, life narrative.

1. Introduction

Rare disease is a general term for a disease with a very low prevalence rate and a small total number of patients. Although the number of patients with a single rare disease is small, as a population, they cannot be ignored. There are about 1,400 kinds of rare diseases known in China, and the total affected population is expected to exceed 20 million[1]. Despite the large number of rare diseases in the group, the voice of the group is weak in single. They have been on the social fringe for a long time, and lack public attention and support.

In recent years, short video has increasingly become the dominant medium for people to understand the world and express themselves in cyberspace. According to the 50th Statistical Report on Internet Development in China, by June 2022, China had 962 million short video users, accounting for 91.85 percent of the total Internet users[2]. The huge scale of short video users has boosted the development of the web celebrity economy. According to the 2024-2028 China Web Celebrity Economic Investment Planning and Prospect Forecast Report released by the Industry Research Institute, the market scale of China's web celebrity economy will reach 1.3 trillion yuan in 2022, and it is expected that the market scale of China's web celebrity economy will exceed 1.6 trillion yuan by 2023, with a year-on-year growth of 23.8%[3]. With the rise of new media platforms such as TikTok and Weibo, many patients with rare diseases have joined the online marketing army. They take the

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242213

initiative to create content, share their activities, release their voices, express their demands, and actively integrate into contemporary society.

The research of rare disease bloggers is the cross-content of web celebrity research and health communication. For Amyotrophic lateral sclerosis (ALS), which attracts high social attention and has no effective treatment, the expression from individual patient not only avoids the disadvantages of mechanical analysis of data theory and the third-party control and fills the gap of current medical analysis materials; but also connects the sick group with the new media technology to explore the secondary empowerment of marginal groups in the real society, and provides a valuable reference for researchers to think about the support and impact of technology philosophy to the whole society.

Therefore, this study chooses ALS patients as an example, which is relatively known by the public. The author conducted a thematic narrative analysis and depth of interview to discuss the ALS web celebrity narrative behavior and network practice.

2. Literature review

2.1. Narrative research

"Narrative" contains the basic structural experience of individual level and social level, and is a way of knowledge organization and basic thought mode of individual and even human beings. By describing individual life and deconstructing and reconstructing individual life stories, narrative research can obtain an explanatory understanding of individual behavior and experience, and find the meaning hidden in the individual's daily life[4].

As a kind of human behavior, narrative refers to the behavior of connecting characters, events, results, and other elements into a relatively complete plot, and telling it through oral, text, video, and other forms[5], has important effects on information transmission, cognitive change, and behavioral incentives.

Narrative research focuses on the whole process of narrative subject, narrative relationship, narrative content and narrative framework, spanning many disciplines, and occupies an important position in the fields of pedagogy, sociology, psychology, medicine and communication. Since the 20th century, with the development of network technology and the popularization of infrastructure construction, more and more people choose to express emotion and record life in cyberspace. Network narrative becomes the norm of network practice, technical innovation and new media features also affect the user's narrative content and narrative strategy, guiding the narrative to fragmentation, linear and surreal direction.

As a specific direction of health communication research, health narrative focuses on the experience and feeling that diseases bring to patients and their families[6], providing individuals with the opportunity to express themselves and understand their own situation[7]. Marginal groups are the main object of Western health narrative research, including children and adolescents, women, immigrants and minorities[8].

2.2. Online narrative of disease patients

"Disease" (disease) and "disease pain" (illness) are two different concepts[9]. Disease means physiological change, and disease and pain include the understanding of the patient and his social relations and even the whole society. In the context of "disease and pain", patients with disease are not only the victims, but also play a unique subject role. They can adjust the relationship between themselves and disease and the outside world through narrative behavior, so as to heal themselves, reshape themselves and even heal others[10]. In this process, the narrator and the listener are often involved together.

DOI: 10.54254/2753-7064/40/20242213

In terms of narrative types of disease patients, scholar Li Feifei summarized Frank's classification method, which divided narrative types into three categories: "recovery narrative", "chaotic narrative" and "exploration narrative" from the perspective of storytelling methods."Recovery narrative" is optimistic about the disease and believes that it will be better; "chaotic narrative" revolves around "I will never get better again"; and "exploring narrative" focuses on the results of the development of the disease[11].

In terms of the content and characteristics of the narrative, the overall narrative style is different in different media types. In terms of rare disease groups, there are more positive attitudes in TikTok platforms, and the overall number is more. However, in the microblog platform, the negative attitude is mostly expressed, and with the deterioration of the illness of several rare diseases "big v bloggers", the number of works is relatively less.

Multiple studies have been conducted focusing on the narrative behavior of patients with the disease. Du Yizhu and Xu Kaibin pay attention to the construction of narrative meaning, spiritual sustenance and emotional support of patients in the cancer online forum "Dancing with Cancer"[12]. Liu Ying and Sun Yang took the hepatitis B forum " as the content and used an analysis method to investigate the emotional support, information support and companionship support in the network community[13]. However, the current domestic academic research focuses on a disease type with a large patient population, and there is not enough research focusing on the online narrative of rare disease groups. Although the overall number of rare diseases groups is large, the social attention is small. As the weak position of this group is more obvious, there is a stronger demand for attention in promoting the process of social equity. Based on this, this study focuses on the network practice and narrative behavior of rare disease groups in online communities.

3. Research design

This study selected ALS bloggers who actively conduct web use practices to research. ALS is a more well-known disease in the list of rare diseases. Compared with other rare disease bloggers, ALS bloggers have higher social popularity, more interaction with fans and richer research texts. In this paper, two new media platforms TikTok and Weibo were selected as research fields, and two approaches are adopted in the selection of research objects: one is to select ALS bloggers with contact information on "TikTok" and "Weibo" according to their nicknames and personal profiles, and obtain 5 respondents through the introduction of the contacted respondents. Telephone interviews and face-to-face interviews were conducted, and each interview lasted more than 50 minutes.

The basic information of the interviewees is shown in Table Table 1.

Table 1: Basic information of the interviewees

Number	Interviewee	Sex	Age	Domicile	Use the platform	Fans (one)
1	WSQ	man	31	Taizhou,Zhejiang	TikTok	3607
2	LJ	man	37	Sichuan Ganzi	TikTok	4237
3	ZZJ	man	50	Shaanxi ankang	Weibo	3506
4	HXB	man	30	Guang'an,Sichuan	TikTok	40021
5	ZDH	man	35	Guang'an,Sichuan	TikTok	2006
6	CJY	woman	37	Guang'an,Sichuan	TikTok	2825
7	FJC	man	33	Nanjing,Jiangsu	Weibo	1779
8	ST	man	41	Wuyi, Hebei	Weibo	31002
9	DJF	man	39	Baoji, Shaanxi	Weibo	43

DOI: 10.54254/2753-7064/40/20242213

This study combines the in-depth interview method and the text analysis method. The main content of the in-depth interview involves the network image presentation, account operation reasons, work theme content and network practice experience of the ALS groups, so as to better understand the account operation characteristics and network communication behavior of the interviewees. The researchers also used text analysis to analyze the short video accounts of ALS bloggers and the comments below, and used keyword retrieval methods to observe all the accounts containing the word "ALS" on the TikTok and Weibo platforms.

4. Research finding

Rare disease groups are marginal groups that are not seen in the social discourse system. The information revolution brought by new media technology has changed the ways and rules of social communication in the past, expanded living space for marginalized groups, rebuilt social relations and gained opportunities to gain social support, and continued their wishes and expectations in the real world. Due to the different physical states, purpose appeal and capital value, the network practice behavior of rare disease bloggers has a distinct particularity compared with that of general web celebrity bloggers.

4.1. Self-performance of suffering and life

4.1.1. Life role: Pain is a part of what I can't hide

In the context of the digital age, image performance has gradually become an important way for individuals to realize self-empowerment. With the help of intelligent technologies such as beauty and face change, individuals not only realize the fine beautification of their external image, but also can obtain more social support and social capital. However, for patients with rare diseases, the pain and its physical damage can not be covered. On the contrary, the image of the pain should be enlarged, so as to confirm their identity and obtain the ticket to enter the community, start the community performance and accumulate social capital:

"At first, people didn't believe I was unhealthy and different from normal people, so they said I was a liar. When I got into a wheelchair in the back, and then my muscles shrank a little. Only at this time they could see that I was sick, and people believed that I was really sick."

The pain image of the sick blogger is closely related to the development of the disease and shows a significant trend of change. They gradually developed from the seemingly healthy image at the beginning of the disease to the image of muscle atrophy, bone deformation, and need to move in a wheelchair, and finally only to maintain a relatively healthy head, needing to rely on a ventilator to maintain life. This process is usually anywhere between 3 and 5 years.

The development of the disease not only reflects the significant changes in the patient's physiology, but also is the process of the blogger's self-identity and reinforcement. In the face of disease and pain, rare disease bloggers can gradually accept and adapt to their own patient image through their own self-narrative and image performance. This process is accompanied by their recognition and acceptance of their new image and new identity, reflecting their psychological adjustment and identity reconstruction in the process of their struggle against the disease:

"I didn't want to accept that at first. I was a strong man before. I did business and I was the mainstay of my family. Later because of this disease, I went home, there was no way for me. Behind that, I took a wheelchair and slowly accepted the fact. There are neither things to cover up, nor can cover up."

Rare disease bloggers face a role shift from an important family workforce to patients who should be cared for, which is an inevitable stage of life. This profound identity change is skillfully integrated

DOI: 10.54254/2753-7064/40/20242213

into their online works. Through the dual narrative strategy of image presentation and image narration, they complete the network performance of self-disease and pain.

From resistance and rejection at the beginning of illness to self-acceptance and active life in the middle of illness, many rare disease bloggers gradually regard illness as a vital part of their body, thinking deeply about how to adjust their lifestyle to the new patient status. In this process, the image of pain is no longer the physical defect they try to avoid, but the focus they desire to be concerned and understood by the public. They thought this as an important window to show the social blind area.

Some rare disease bloggers interviewed said there is "nothing to hide". The change of attitude comes from the acceptance of patient's position and rare disease, and also from their expectation and hope for being concerned and understood: " I hope you can see us, so that we can have more hope of healing."

4.1.2. Life scene: I am not confined to the hospital bed

The concept of scene originated from the field of film and television drama, which refers to a behavior occurring in a specific time and space, or an occasion and environment of characters' activities. The life scenes of rare disease bloggers constitute the basic elements of their self-performance and self-narrative. By showing daily life scenes, rare disease bloggers tell their netizens and fans about their unique and rare life, win social attention, correct network cognitive bias, and empower their own network practice.

Different from sudden diseases such as cancer, the disease development of ALS patients is gradual. Their original life will not be permanently stagnant due to the intervention of the disease, but needs to constantly adapt and adjust, and living with the disease has become the daily state of patients with rare diseases.

Although in the case of physical disability, the daily life of patients with rare diseases is often misunderstood by the outside world as "staying at home" or even "never leaving in bed", in fact, the disease does not limit their physical activity ability to a large extent. However, they still maintain their love and pursuit of life. Through self-performance and narrative, the sick blogger showed to the outside world a group image who loves life and works hard:

"I met a patient in the city center today and talked to him for half a day. Everyone is not easy, we got this disease, and now we are families."

"The pickled pickles and duck eggs have already been sent to the delivery station. Consumers will receive them soon. Thank you all for your support and help."

In patients with rare diseases whose physical condition is not so serious that have to rely on medical equipment auxiliary stage, they still maintain their daily travel activities, through the way of narrative subject, directly showing and describing their life scene, effectively avoiding the patient group of third party screening and prejudice, thus more real, directly presents the image of patients with rare diseases and the inner world. This kind of self-display and narrative not only helps the outside world to have a deeper understanding of the living conditions of patients with rare diseases, but also helps to dispel misunderstanding, eliminate estrangement, enhance the social understanding and acceptance of patients with rare diseases.

In addition to offline social networking and revenue activities, patients with rare diseases will also have some leisure activities and upload the scene to the Internet:

"Sometimes I also take some beautiful scenery, some sunsets, some crops and rivers in the countryside. I hope to cheer everyone by doing this. Of course, my mood will be a little better, too."

Scene communication is a communication activity with the scene as the core, and the key is to present the scene. The sick bloggers carry out some daily leisure activities, and upload and share these scenes through the online platform. This scene display on the Internet not only enriches the life experience of patients with rare diseases, but also provides a platform for them to show themselves,

DOI: 10.54254/2753-7064/40/20242213

communicate and interact, which helps to further promote the social attention and understanding of patients with rare diseases.

By moving their personal life from the background to the front desk, rare disease bloggers incorporate their own life and production scenes into the image performance, effectively shortening the psychological distance between the audience and bloggers, and strengthening the emotional communication and interaction between bloggers, fans and netizens. This diversified scene narrative strategy not only fully shows the multi-dimensional appearance of the life of bloggers with rare diseases, but also creates a three-dimensional, complete and human image of patients with rare diseases. When the audience resonates with the scene and the emotions, they will have deep empathy for the role played by the blogger and their life experience, and then actively respond to the behavior and expectations of the blogger, forming a virtuous cycle of interaction.

4.1.3. Life story: Family is the fate that I can't give up

When faced with the challenge of serious illness, the recovery and life of patients with rare diseases are often inseparable from the deep care from their families, which makes family stories become an important basic material for sick bloggers to describe their daily life on the online platform. Many rare disease bloggers take family stories as the core content, and integrate them into the network image performance. They convey a complex and sincere emotional experience by describing their warm moments, their deep emotions and their inseparable blood ties. This narrative method not only enriches the self-expression of rare disease bloggers, but also enhances the reality of their network image, and helps to deepen the public's understanding and attention to the life of rare disease patients and their families.

A blogger who has been ill for more than a decade wrote: " I am lucky. I don't have to do anything now. My mother will take care of all of my life. I am now an idle person. I did not expect to become the one who was taken care of again. But my mother is nearly 70 years old and has to take care of me every day. My mother is really great."

It is not necessarily the elders who support sick bloggers. Another blogger said, " My wife divorced me and my 12-year-old child take care of me while going to school now. My son learned to face difficulties and learn to be fearless in such a young age, which made me ashamed."

Through the in-depth narration of kinship and family stories, the sick blogger expressed the complex feelings of dependence and gratitude for his family, but also revealed his inner guilt and contradictions. This narrative approach not only provides a platform for bloggers to express their guilt and gratitude, but also highlights the importance of the family as an indispensable spiritual pillar and safe haven for bloggers.

In addition, relatives also actively participate in the life narrative of rare disease bloggers as narrative subjects. Given that it is difficult to create, shoot and edit the video content independently, relatives often play a helping role in the process. They not only appear in the family stories as actors, but also play the role of collaborative creators, building and presenting these emotionally deep stories together with the bloggers.

A rare disease blogger's husband wrote: " We should enjoy the sweet age, but my wife found ALS in 2018. Her body has been frozen, with saliva cough, difficulty swallowing, and basic can't talk, began to live in a race against time. But from now on, honey your life no longer belongs to your own, but belongs to the people who love you. Good luck."

In the family story narrative, the family members give the rare disease bloggers rich spiritual support and stable physical support, which becomes a powerful motivation for the rare disease bloggers to overcome the difficulties. Relatives also constantly express their expectations for the blogger in the narrative, hoping that the blogger can relieve the physical pain and live a healthy life in the next life.

DOI: 10.54254/2753-7064/40/20242213

4.2. Disease-resistance philosophy in the protracted war

4.2.1. Race with life: cherish the present and plan for the future

Autobiographical narrative is a special form of narrative designed to understand people's autobiographical stories in a cultural context[14]. ALS is a chronic disease with no effective treatment options, and patients have to witness gradual deterioration until death. But unlike cancer, ALS is diagnosed very early, and the death cycle takes years or even decades, which means that patients have a relatively longer time to cherish the present and plan for the future.

A sick blogger said:

"It's a race against life, a race against disease. If you can catch up with drug development, you can live as long time as possible. There are a lot of things to do, so I can not waste."

Cherish the present reflects the positive response of sick bloggers to the real world. They transform their dissatisfaction with suffering and the injustice of fate into a positive force to fight against fate and pursue greater life value.

On the other hand, the behavior that rare disease bloggers take the initiative to choose their self-image to shape and display, and strengthen their strong spirituality is also a response to life responsibility. It also involves the sick blogger's planning for the future life. Many rare disease bloggers who have already had children believe the faith that recording life and inspiring their children is a vital reason for releasing daily videos.

For example, an ALS mother said:

"I want to use my colding story to let my son know that no effort will be wasted. As long as I don't give up my life, I will have infinite possibilities, even I can contend with my fate. How I hope I can accompany my son to grow up."

Some of the mothers, who were also ill with their son, said:

"What can I do otherwise? I am still a mother of two children. I can only think in the long run."

When it comes to imagining the later stages of the illness, many bloggers " want to do more when they are in better shape. "One blogger said in his vlog:" When we really met our wardmate face to face, we were much more touched than watching them online. He is now on a ventilator but he took it off in order to talk to me. I looked at him breathing in miserably, as if I would be tortured and suffocated in the future."

In this regard, she hopes to "record life while resisting freezing, in order to leave no regrets. Hoping that these works can be left for the family in the future."

Planning for the future is an important practical reason for rare disease bloggers. Disease bloggers expect their living videos, especially some positive videos can inspire and comfort the living, continue to play a role in influencing reality in their departed future, and respond to the needs and expectations of the living.

4.2.2. Spiritual power transmission: the doctor-patient relationship is absent and the strength among the patients rise

Patients with rare diseases rarely have long-term interactions with doctors due to their rare condition, few cases, lack of treatment experience, poor curative effect, and high long-term hospitalization costs. Doctor-patient relationship narratives are not common in the work of ALS bloggers. In the absence of the doctor-patient relationship, experienced wardmates can not only provide relatively rich treatment experience, but also give play to the group advantage of group heating, and occupy a high position in the interpersonal relationship of patients.

CJY, the patient's family member, expressed the help and support from her son's wardmate HXB: " He doesn't go out. He is afraid of being laughed at, so he doesn't go out. Then XB came and said

DOI: 10.54254/2753-7064/40/20242213

‘Fear what? And I would dare to go out’. XB came to see him to encourage him and call him to come out. Tell him repeatedly that he has to accept the reality.”

Emotional support between patients naturally and uniquely meets the basic need of "understanding and resonance", which is an emotional comfort that no other group, including family and non-patient friends, can replace. As a "companion" group of rare disease patients, almost all the rare disease bloggers have expressed the original intention of encouraging their wardmates. Patients are also very willing to transfer positive energy and encourage each other through sharing, so as to enhance the overall strength of their comrades.

For example, some bloggers who regain confidence in life will have a more sober and thorough understanding of the difficulties and troubles in life, and even develop a set of their own philosophy of life. They are willing to share these "insights" or "long-thinking" life experience with others. They are willing to calm network rage with their own inspirational life and sunshine mentality digestion, to inspire troubled patients, and give others positive emotional support: " I hope to bring everyone sunshine and encourage everyone. Now the online anger is too heavy, I hope everyone can face life actively.”

Relational narratives emphasize shared subjectivity. In the shared discourse, the narrative subject is not only the individual blogger, but also the sick patients interacting with the blogger. The narrative story is not limited to the blogger's own story, but the common story among the patients. In this process, the mutual narrative between patients also helps the blogger to further relieve the theme of suffering in the narrative, so as to convey a more positive value orientation and guide the expression of the work to a more positive direction.

The emotional support structure among patients is affected by the strength of psychological energy, forming a relatively clear classification of social capital in the network of patients. Generally speaking, bloggers who enter the career early, have good operations, and also take more responsibility in the patient group are more likely to support their emotional support to convey love and hope to other patients.

In the mutual verification of consciousness and unconsciously among patients, the narrative subject has developed from a single blogger to a patient group based on the identity logo of "similar", the emotional mutual assistance and social support in the patient relationship network have also become important themes of the narrative.

For example, "WSQ" is the "big brother" of one group of fellow bloggers. His imagination of emotional support is not limited to online mutual encouragement, but also extends to offline and future considerations, and even generates an idealistic future expectation:

"I want to do a good job of the account, when I become a big boss, those who can not take care of themselves can be picked up. We can live with our wardmates and ask nannies to take care of.”

4.3. The web celebrity process accompanied by life

4.3.1. Narrative healing: another help beyond drug therapy

Health narratives are believed to help patients with illness, pain or trauma by expressing emotional and personal experience. As Frank argued in his book The wounded Narrator: The Body, Disease, and Ethics, patients give meaning to encounters and are cured in narration[15]. The process of sick bloggers participating in online practice and starting the web celebrity career is also a process of self-healing for bloggers as patients.

In the narrative, sick bloggers often adopt positive narrative strategies to express their love for life, express their firm belief in fighting against fate and create new meaning for suffering experiences, so as to construct their own spiritual fortress. This is not a simple spiritual victory, but the patient's self-comfort and self-healing, which is a positive psychological treatment.

DOI: 10.54254/2753-7064/40/20242213

In his work, a former dancer, ALS blogger wrote:

"I can no longer deduce the visual beauty, but I can still convey the truth of life and the power of the heart, because of love so I insist."

Self-motivation is a common theme of rare disease bloggers' narratives. Positive autobiographical narrative not only helps patients to understand and accept disease and pain, but also helps to relieve pressure, strengthen spiritual strength, and play a certain healing role while self-motivation. Sick bloggers transcend the bondage of the material body, pursue the strength of the spiritual world, strengthen the meaning of life and the power of the mind in the narrative. They heal their mind by giving themselves full value.

Cyberspace for rare disease bloggers provides a chance to have a new life space. By creating a more positive image, they can remind themselves to pay more attention to happy memories in life to reduce the pain of disease. Life is the reflection of the difficult reality. By enhancing the positive force in the face of suffering, the narrative has played a positive effect in delaying the deterioration of the disease.

Quite a few rare disease bloggers have the idea of "living well" and "having hope for life". They turn their hatred of disease and their dissatisfaction with fate into the motivation to fight against fate, from the weak in the material world to the strong in the spiritual world.

4.3.2. Multi-linear narrative: life perception is always new

The conventional linear narrative structure tells the course of the occurrence and development of events in chronological order[16]. Although it conforms to the general law of the development of events, there are the disadvantages of ignoring personal subjective experience and recalling experience. The multi-linear narrative structure narrates the same event at different times with different narrative clues, expressing the different feelings of the sick bloggers in different periods, and reflecting the blogger's new life thinking. In the practice of web celebrity, the content narrative of sick bloggers revolves around their "disease pain" and "suffering", and has different narrative strategies in different periods of illness.

In the early stage of the illness, the content creation of rare disease bloggers revolves around their "biological life". With the network as the medium and the platform as the basis, rare disease bloggers began to move their offline life and offline performance to the online space, telling the major turning point of their lives in new scenes and contexts. During this period, bloggers' content creation focused on diagnosis information, disease popularization and illness feelings, expressing dissatisfaction with their fate and expecting themselves to be misdiagnosed:

"I really hope this is just a dream. I wake up and I found I was healthy."

With the development of the disease, the body signs caused by the disease gradually revealed, and the scale of fans gradually accumulated. The increase of heat at the same time is also accompanied by the reduction of the increasing difficulty of creation caused by illness. During this period, bloggers no longer limited their content creation to "biological life narrative", but more watched the rest of their lives by observing the irreparable results, expressing their attitude and perception of life through thinking about life, the world and interpersonal relationships. Since then, the narrative content mainly revolves around its "spiritual life" and "social life".

"Live a positive life. When met my friend who is not happy, I would try to persuade them to be positive."

During this period, when the result of biological life could not be changed, the spiritual life gradually broke through the shackles of the physical body and guided the individual to integrate life with reason and value. Thinking about illness and the sense of responsibility for family and society begin to internalize into individual self-awareness, calling for the surge of new life. Spiritual life is

DOI: 10.54254/2753-7064/40/20242213

born under the "rotten tail" of biological life, highlighting the challenge and resistance to disease and fate.

In addition to their life beliefs, some rare disease bloggers also regard it as their duty to promote disease cure and popularize the diagnosis and prevention of rare diseases. They also make use of their social status, resource advantages and simple experience of becoming a medical doctor to convey kindness to the society and give full play to their social values:

"It is to release some information about refuting rumors. A lot of misdiagnoses, including some media reports, are wrong."

"The public doesn't know much enough about our disease. They think us just like normal disabled people, but not."

"Narrative of social life" is particularly evident in CaiLei, the vice president of Jingdong. Since his illness, CaiLei has actively released news about promoting drug research and development under his major accounts. In addition, "ST" and other bloggers also insist on updating popular science content of ALS, responding to patients' help actively, and giving full play to their social value in the rest of their lives.

4.3.3. Collaboration across time and space: the continuation and immortality of digital life

In the later stage of the disease, due to the loss of mobility, unclear words, difficulty in speaking, the decline of physical strength and energy, and other symptoms seriously, the quality and renewal speed of their work descend. At this stage, the web celebrity career of rare disease bloggers will disappear.

"Now I publish works less because I am getting worse and tired."

"I can't speak easily now, so I can only type to communicate."

As a blogger's life comes to an end, his new media account will be stopped. His account only publish a birthday blessing automatically every year. However, some accounts will continue to have a certain number of fans after the owner die, some of them even extend into a memorial space that bears the blogger's ill-resistance memory, provide virtual places for patients and netizens to mourn, and still play the role of social value such as encouragement and belief for a long time.

For example, in the video of the death of the well-known inspirational web celebrity "Zhuo Jun"'s account, many netizens expressed their grief and wishes:

"Zhuo Jun, go well on your way to haven. I pray you a healthy, safe and happy life."

"Ming, my brother, walk well, tears run up."

The formation of memorial space is a kind of multi-subject cooperative narrative behavior across time and space. Under the account of the sick blogger, netizens from different regions publish contents at different times, thanks and wishes to the blogger or comfort and encourage the blogger's family, which are all the secondary processing and extension of the blogger's original content.

Death is an unavoidable topic of life. In all philosophy and religion, death is not the end of life, forgetting is. Because of this, the memory of the deceased becomes a continuation of the spiritual and social life of the deceased.

The collective digital mourning in cyberspace is a kind of ritual behavior, and the original narrative of the blogger is gradually abstracted into concrete symbols in the collective mourning of netizens, which is constantly lofty and idealized. Through the joint participation of netizens and collective writing, it eventually becomes a collective memory, adding new meaning on the basis of imagination and memory.

As one patient said, "We can be very pleased that every day he lives is surrounded by love. He and his parents created miracles that have warmed and inspired us to move forward, we also seem to see, at this moment, he is smiling and saying to us: come on, you will go further and further."

Digital media technology not only changes the behavior and way of individuals, but also changes the way individuals are remembered. With the massive storage space and the diversity of recording

DOI: 10.54254/2753-7064/40/20242213

methods, digital media has retained the real images of a large number of bloggers who have died of rare diseases. These images have been constantly added new meanings and value to the cross-space collaboration narrative of netizens, which inspiring later generations. If the work kept under the blogger's private account is also regarded as a memory, then the deceased rare disease blogger gets "immortal" in the digital memory.

5. Discussion and conclusion

This study examines the works as a rare group of ALS blogger network performance behavior through the in-depth interviews and text analysis, disease philosophy expression and web celebrity practice career, and explores the ALS blogger network practice and the uniqueness of network narrative from life and living, social relations and new media technology three levels. The new media technology and web celebrity occupation have expanded the life visibility of rare disease groups, increased the intersection range of rare disease groups and the outside world, and also brought new thinking about life and ethics.

First of all, the development of the web celebrity career of rare disease bloggers is highly consistent with their own life process. Different onset stages not only affect their own demands and desire to express, but also are related to the content, form and attention of their works. With the progression of the disease, the symptoms are increasingly revealed, and the impact of the disease on the physiological function gradually increases. While gaining the trust of fans, the difficulty of the blogger to update his works increased, and intensified the "acceptance" and "stigma" of the blogger psychologically, which has an impact on the identity transformation of the blogger. With the extreme deterioration of the condition and even the death of the blogger, the web celebrity account stopped more, at this time, the digital life gradually emerged.

Second, this paper does not observe one specific online forum. On the one hand, influenced by the actual situation of the selected research subjects, the number of patients with single types of rare diseases is relatively small, and it is more difficult for patients with rare diseases to contact. This study did not deliberately avoid the possibility of contact with other rare diseases, but compared with the fatal diseases such as cancer and hepatitis B with higher social attention, there are few single cases of rare diseases, and there is a lack of practical basis for sharing information among patients with different rare diseases in China. Therefore, there is always a lack of an aggregated online forum similar to "dancing with cancer" online forum. The "weak connection" network established on large social media platforms such as TikTok and Weibo is a more common way to connect and interact among patients with rare diseases in China. Therefore, in this study, the patient established the interview relationship first and then contacted the patients with rare disease web celebrities. Based on this, this research selects two more open new media platforms, which include bloggers, patients, fans and ordinary netizens into the research scope, and takes the private account of the blogger as the platform. In addition, the network practice of rare disease bloggers is generally an external practice, rather than limited to their own group. The identity of their web celebrity stipulates that they must be oriented to the whole society. Therefore, choosing the research mode of selecting online — and offline linkage and multi-platform joint observation has more practical guiding value than focusing on a single patient forum.

Of course, sick bloggers are not entirely involved in content creation. While sharing their lives, diseases and insights, many sick bloggers also use online platforms to carry out live streaming or short video sales, selling their hometown agricultural and sideline products and discounted daily necessities, so as to subsidize their families. In the video, their image characteristics, including perseverance and unremitting self-improvement, have also won social attention and social support. Some bloggers with more serious rare diseases will also receive rewards for shorter daily stories or essays, and cooperate with public welfare organizations to provide scientific guidance on rare

DOI: 10.54254/2753-7064/40/20242213

diseases, etc. This is a normal result of the unique evolution process and the situation of rare disease groups.

It is worth noting that the rare disease groups this paper focused on are patients with muscle weakness and muscle atrophy caused by genetic problems. The remarkable feature is that the disease will gradually lead to physical disability, and the patients without exception will go to the end of life due to illness. However, there are many kinds of rare diseases, and different diseases have different degrees of damage to patients' physiological function and life and health. For example, rare diseases such as albinism do not affect normal life and longevity of patients. Therefore, the conclusions of this study on patients with rare diseases cannot be applied to all patients with rare diseases.

References

[1] *Frost Sullivan, the Pain Challenge Foundation.2023 China Rare Disease Industry Development Report [EB / OL]. Beijing: Beijing Disease and Pain Challenge Foundation, Frost & Sullivan, 2023:9-10.*

[2] *China's government network. The 50th Statistical Report on Internet Development inChina[EB/OL].2022-8-31[2022-09-01].http://www.gov.cn/xinwen/2022-09/01/content_5707695.htm;*

[3] *Ruiguan Industrial Research Institute. China Internet celebrity Economy 2024-2028[EB/OL].2024-04-23[2024.04.23].https://www.reportrc.com/report/20240112/56495.html*

[4] *Fu Min, Tian Huisheng. Educational narrative research:Essence,Characteristics and Methods [J]. Educational Research, 2008 (05): 36-40.*

[5] *Li-bin wang. Exploring the disease expression of cancer patients on the "Zhihu" platform from the perspective of health narrative — An empirical study based on patient self-report [J]. Southeast Transmission, 2021 (01): 127-131.*

[6] *Green, M.C."Transportation into Narrative Worlds: The Role of Prior Knowledge and Perceived Realism." Discourse Processes 38.4 (2004):247-266.*

[7] *Sharf, B.F., & Vanderford, M.L.(2003).Illness Narratives and the Social Construction of Health.In Thompson, T.L., Dorsey, A.M.,Miller, K.I., & Parrott, R.(Eds.), Handbook of Health Communication (pp.16-28).Mahwah, NJ: Lawrence Erbaum.*

[8] *Xu Kaibin, He Yuying. The evolution of the "knowledge picture" of western health narrative research — is based on the analysis of the literature related to SSCI from 1992 to 2018 [J]. University of Journalism, 2021 (05): 1-21 + 121.*

[9] *Kleinman, A.(1988).The illness narratives: Suffering, healing, and the human condition.New York,NY: Basic Books.*

[10] *Høybye, M.T., Johansen, C., & Tjørnhøj-Thomsen, T.(2005).Online interaction: Effects of storytelling in an internet breast cancer support group.Psycho-Oncology,14(3), 211-220.*

[11] *Li Feifei, Wang Cheng Wei. How self-empowerment is possible in women with breast cancer: thinking based on the cancer narrative [J]. Medicine and Philosophy, 2019,40 (06): 17-20.*

[12] *Du izhu, Xu Kaibin."Dancing with Cancer" and "Dancing with Love": the meaning construction of the online cancer narrative [J]. University of Journalism, 2023, (07): 56-70 + 119.*

[13] *Liu Ying, Sun Yang. Research on social support in online virtual communities of vulnerable groups — Take the hepatitis B forum "sincere care" as an example [J]. Journalism and Communication Research, 2011,18 (02): 76-88 + 111-112.*

[14] *Bruner, Jerome. "Life as Narrative." Social Research 71, no. 3 (2004): 691–710. http://www.jstor.org/stable/40971721.*

[15] *Frank A W.The wounded storyteller:Body, illness, and ethics[M].University of Chicago Press, 2013.*

[16] *Xiao-man wang. The humanistic perspective based on health narrative turns to —. Taking the wechat public account "fruit shell patient" as an example [J]. News world, 2024(02):26-29.DOI:10.19497/j.cnki.1005-5932.2024.02.007.*

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242244

Social Inequality in the Age of AI: Implications for Labor, Wage Distribution, and Worker Power

Xiao Jia[1,a,*]

[1]*Faculty of Business and Economics, University of Malaya, Kuala Lumpur, Malaysia*
a. Moshook@163.com
**corresponding author*

Abstract: This article critically examines the multifaceted impact of artificial intelligence (AI) on social stratification, situated within the broader historical context of automation-driven productivity advances. Drawing on empirical evidence and evolving theoretical frameworks, we elucidate the intricate dynamics of labor market transformation, skill obsolescence, and wage distribution in the nascent AI epoch. We employ a nuanced task-based approach to move beyond simplistic dichotomies of skill-biased technological change, offering a granular understanding of AI-induced labor market polarization. Our analysis reveals that AI is reshaping the contours of inequality through complex interactions of skill restructuring, wage decoupling from productivity, and shifts in worker bargaining power. We argue that the current trajectory of AI development may accelerate capital-biased technological change, potentially exacerbating existing inequalities. This article not only contributes to the scholarly discourse on technological unemployment and income inequality but also serves as a foundation for evidence-based policymaking in navigating the uncharted territories of human-AI interaction.

Keywords: Artificial Intelligence, Social Inequality, Labor Market Polarization, Skill-Biased Technological Change, Wage Distribution.

1. Introduction

"Day by day, the machines are gaining ground upon us; day by day we are becoming more subservient to them; more men are daily bound down as slaves to tend them, more men are daily devoting the energies of their whole lives to the development of mechanical life." [1]

As humans stand at the precipice of what some scholars term the "Fourth Industrial Revolution"[2], the potential for AI to reshape fundamental aspects of work, productivity, and social organization demands a rigorous reexamination of established theories and policy frameworks. Concurrently, the emergence of "foundation models" in AI [3] – large-scale, adaptable neural networks capable of performing a wide array of tasks – has introduced new dimensions to the debate on AI's economic implications. These models, exemplified by GPT-4 and its successors, demonstrate potential for generalized task performance that blurs traditional boundaries between narrow AI applications and more generalized cognitive capabilities. This development raises profound questions about the future trajectory of human-AI collaboration and competition across various economic sectors. Moreover, the distributional consequences of AI adoption extend beyond the labor market, potentially reshaping patterns of wealth accumulation and capital ownership. As Korinek and Stiglitz [4] argue that AI

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242244

could accelerate the trend towards "capital-biased technological change," , presenting a Janus-faced future of unprecedented productivity gains and potentially exacerbated inequality.

This article examines the complex impact of artificial intelligence on social inequality, revealing intricate interactions between skill restructuring, wage distribution, and power dynamics. It contextualizes the current technological revolution within the broader historical continuum of automation-driven productivity advances. Synthesizing a rich corpus of empirical evidence and evolving theoretical frameworks, this article elucidates the intricate dynamics of labor market transformation, skill obsolescence and regeneration, and wage distribution in the nascent AI epoch. Transcending conventional economic metrics, it explores broader societal implications, including the erosion of worker bargaining power and the existential ramifications for human labor in an increasingly automated world. This article not only contributes to the scholarly discourse on technological unemployment and income inequality but also critically examines the evolving relationship between technological progress and social equity. In doing so, we confront an economic landscape in flux, where the traditional nexus between productivity gains and wage growth has been severed, and the future of work itself is being radically reimagined.

2. Historical Context of Automation and Productivity

The early 18th and 19th centuries saw the birth of automation with the Industrial Revolution. This period marked a significant shift from manual labor and animal-based production to machine-based manufacturing. The introduction of steam power and mechanized production processes led to unprecedented increases in productivity and economic output. However, this transition was not without its social costs, as artisans and skilled craftsmen found their livelihoods threatened by the new industrial paradigm [5]. The Second Industrial Revolution, spanning from the late 19th to the early 20th century, brought about further advancements in automation through the widespread adoption of electricity and the assembly line. This period saw the emergence of scientific management principles, epitomized by Frederick Taylor's work, which sought to optimize labor productivity through the systematic analysis and reorganization of work processes [6]. While ostensibly aimed at optimizing productivity, Taylor's methods effectively divorced conception from execution in the labor process, leading to widespread deskilling and alienation among workers [7]. With the development of labor division, workers were required to focus on increasingly narrow and repetitive tasks, completing them at high speeds. This so-called Taylorist work organization method - also referred to as "scientific management" by organizational expert Frederick Taylor - created enormous pressure among workers, who found it increasingly difficult to identify with the final results of their work [6]. Consequently, in the 1960s, social movements began to erupt, expressing demands for the reduction of dehumanizing work, improvement of working conditions, and acceleration of wage growth. The post-World War II era witnessed the rise of computerization and the beginnings of what some scholars term the Third Industrial Revolution. This period saw the integration of electronic and information technologies into manufacturing processes, leading to the development of numerically controlled machine tools and early robotics [8]. The automation of cognitive tasks began to complement and, in some cases, replace the automation of physical labor that had characterized earlier periods [8]. Compared to the first two waves of technological logic transformation, the economic benefits brought by the Third Industrial Revolution, based on information and communication technology innovation and the introduction of robots, were much smaller. As Robert Solow's famous productivity paradox – "You can see the computer age everywhere but in the productivity statistics" [9].

This paradox remains applicable in the age of artificial intelligence. Despite rapid technological advancements, many developed economies still experience slow productivity growth [10]. The late 20th and early 21st centuries have been marked by rapid advancements in digital technologies, giving

DOI: 10.54254/2753-7064/40/20242244

rise to what has been termed the Fourth Industrial Revolution or Industry 4.0. This era is characterized by the convergence of physical, digital, and biological technologies, with artificial intelligence playing a central role. Unlike previous waves of automation that primarily affected routine and manual tasks, AI has the potential to automate a wide range of cognitive and non-routine tasks. This has led to concerns about the potential for widespread job displacement across various skill levels and occupations [11]. Overall, existing research indicates that when the scope of analysis is extended to developing countries, the introduction of robots has had a significant and larger negative impact on employment [12]. Historical patterns also suggest that technological change often exacerbates inequality, benefiting capital owners and high-skilled workers at the expense of the broader workforce. Recent work by Korinek and Stiglitz [4] indicates that AI could accelerate this trend, potentially leading to a "singularity" of inequality where a small elite captures an ever-increasing share of economic benefits. Furthermore, Acemoglu and Restrepo [13] suggests that the current trajectory of AI development may be "so-so technologies" – innovations that displace workers without significantly increasing productivity. In light of these critical perspectives, it becomes clear that the historical relationship between automation and productivity is far from a linear narrative of progress. Instead, it is characterized by contradictions, unintended consequences, and persistent social challenges.

3. Labor Market Polarization and Skill Restructuring

Artificial intelligence, along with many other automation tools, affects human tasks in three main ways: through displacement, it reduces the demand for labor in automated tasks; through productivity, it raises the demand for labor in non-automated tasks; and through reinstatement, it designs new tasks for labor. Over time, the displacement effect of automation will be offset to some extent by its productivity and reinstatement effects, but the speed is highly uncertain [14]. This effect can be direct, significant, and obvious and is therefore essentially negative for employment in general and for labor's share of value added. However, the productivity and reinstatement benefit will take years, if not decades, to materialize—during which period, there will be considerable frictional and structural unemployment, wage losses, and growing inequality [15]. The long run—that vaguely defined concept often used by economists—finds automation, productivity growth, employment rates, and wage increases all proceeding in tandem.

The concept of skill-biased technological change (SBTC) has been a cornerstone in understanding the evolving dynamics of labor markets in the face of technological advancements. SBTC posits that technological progress disproportionately benefits high-skilled workers, leading to increased demand for their labor and, consequently, higher wage premiums [16]. For example, high-skilled workers (such as engineers, programmers, data scientists, etc.) become more important, while some medium-skilled and low-skilled jobs are replaced by machines and algorithms. This leads to a significant increase in income for high-skilled workers, while the income of medium-skilled and low-skilled workers stagnates or declines, widening the income gap. Figure 1 illustrates this trend using data from the Canadian Workplace and Employee Survey (WES) [17]. In the context of AI, this phenomenon has taken on new dimensions. Unlike previous technological shifts that primarily affected routine tasks, AI's capacity to perform complex cognitive functions is reshaping the very nature of skill demand. Empirical evidence suggests that AI is not merely augmenting high-skilled labor but is also beginning to substitute for certain high-skill tasks, particularly those that are analytical and predictable in nature [18]. Recent research by Acemoglu and Restrepo [14] introduces the concept of "excessive automation," where AI technologies may be deployed even when the productivity gains do not justify the displacement of human labor, potentially exacerbating inequality and inefficiency.

DOI: 10.54254/2753-7064/40/20242244

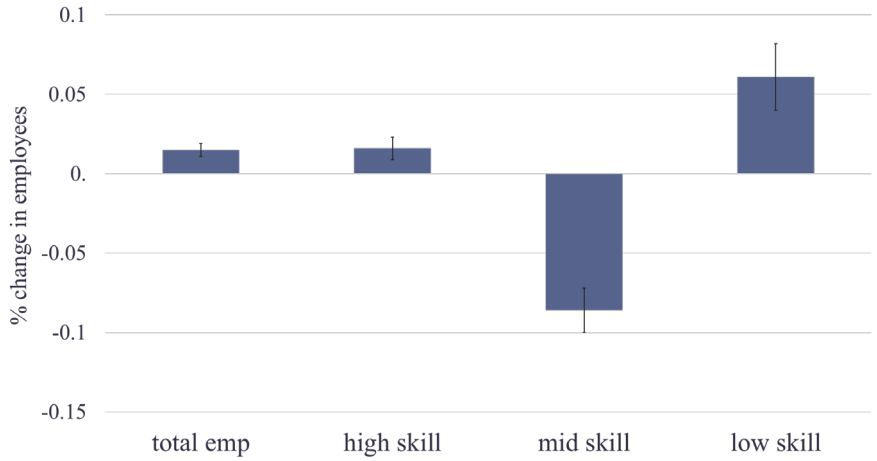


Figure 1: The effect of AI adoption on employment types in Canada [17]

The task-based approach to labor market analysis, pioneered by Autor, Levy, and Murnane [19], provides a more nuanced framework for understanding the impact of AI on employment structures. This model disaggregates jobs into constituent tasks, categorizing them along two primary axes: routine versus non-routine, and cognitive versus manual. The advent of machines and algorithms has significantly altered the landscape of task automation, extending beyond routine tasks to encompass a wide array of non-routine cognitive tasks. This shift has led to a phenomenon known as "labor market polarization," characterized by the hollowing out of middle-skill jobs and the concurrent growth of both high-skill and low-skill employment [20]. As the Polanyi paradox suggests, many of the skills and knowledge we possess are acquired through practice and experience, rather than through explicit rules or theoretical learning [21]. These skills include complex judgments, intuition, and craftsmanship, which are difficult to teach machines through explicit instructions or algorithms, i.e., tasks involving what Polanyi [22] called "tacit" knowledge. This leads to a decrease in labor demand for job categories with high routine content (mostly middle-income). At the same time, other types of labor, namely abstract labor and manual labor, will benefit from improvements in computer capital efficiency. This explains why demand for high-skilled abstract workers and for manual laborers at the lower end of the income distribution actually increases. In other words, this is due to the strong complementarities between automation and labor that can increase productivity, raise incomes, and increase demand for labor. However, the impact of AI on this polarization trend is multifaceted and potentially non-linear. Today, AI can already "solve" some human tasks. As long as it is trained on examples and given an appropriate labeled image database and sufficient processing power, AI will provide solutions, which Autor [23] calls "Polanyi's revenge." As AI systems evolve to perform an ever-expanding array of tasks, the premium on uniquely human capabilities – such as complex problem-solving, creativity, and emotional intelligence – is likely to increase, reshaping the contours of labor market polarization in ways that are still unfolding [24].

4. Income Inequality and Wage Distribution

In sharp contrast, polarization has exacerbated wage gaps across workers, in which wages for those whose occupation was automated fell slowly, was stagnant, or was even negative, compared to the growing wages for those whose occupation benefitted from improvements in productivity or new task creation. As advanced, industrialized economies developed, this was directly linked with increasing income inequality, fundamentally due to a substantial wage gap or education premium between workers previously provided with a university or rigorous education that SBTC complemented and

DOI: 10.54254/2753-7064/40/20242244

those workers of lower education or training whose skills were now displaced [25]. Automation has also brought substantial displacement and polarization effects and has, moreover, contributed to wage growth increasingly becoming uncoupled with productivity growth [26]. In theory, wage growth should be at par with productivity growth in the long run. Still, growth in productivity has taken an unprecedented pace over three decades ago vis-à-vis average and median wage growth. As has been said, the long run can certainly be very long, with substantial and protracted deviations along the way. The decoupling of wage and productivity growth, then, has brought about a fall in the labor share of national income [27]. The fall in the labor share is partly driven by automation, not only is automation and the declining labor share most pronounced in manufacturing but even within manufacturing, the industries that are automating most rapidly. Moreover, the decline in labor's share of national income is mirrored by a rise in the share of capital, which not only reinforces the increase in income inequality but also concentrates capital returns at the top of the income pyramid. Over the past half-century, slow growth in pre-tax market income for the bottom 95% of wage-earners has been a major force behind the rise in income inequality across developed market economies—with automation playing an outsized role [28].

At the same time, we recognise AI may enhance human productivity in at least some of the currently performed tasks and may generate others for which human skills are needed that AI capabilities cannot substitute. Indeed, under most plausible assumptions about the pace of technological adoption and improvement, in 2030 social and emotional skills will be the most significant drivers of total working hours in developed economies [29] (see Figure 2). Specifically, occupations that require a high degree of emotional intelligence, creativity, and complex problem-solving – such as healthcare professionals, educators, and managers – are likely to see sustained or increased demand. The decline in hours worked for physical and manual skills (-11%) and basic cognitive skills (-14%) points to potential job losses or transformations in occupations such as manufacturing workers, clerical staff, and certain service industry roles. Importantly, these occupational changes may exacerbate wage and income inequality between workers whose skills are displaced by AI and those whose skills are complemented by it.

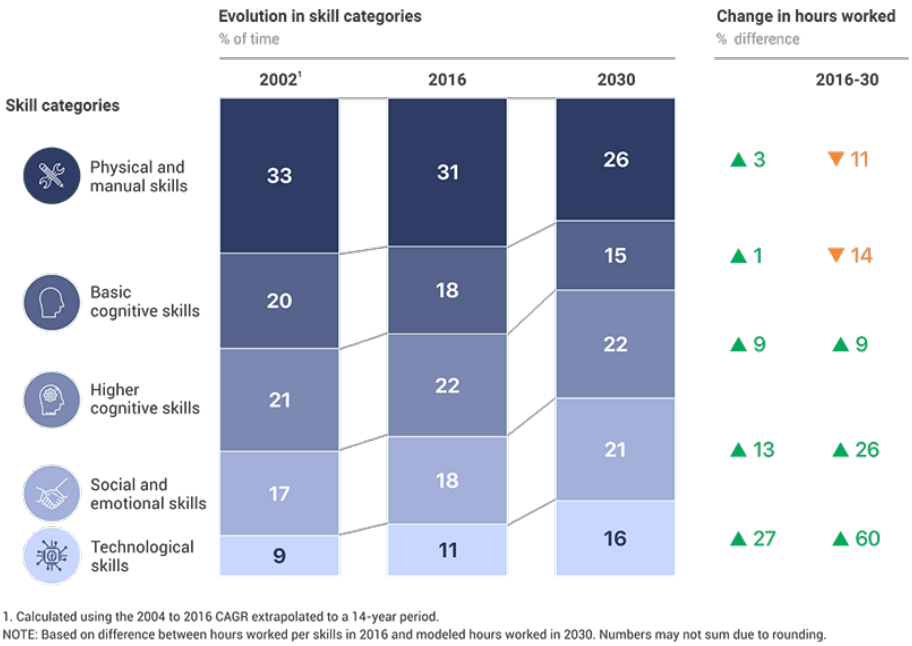


Figure 2: Projected Changes in Workforce Skill Requirements from 2002 to 2030 [29]

DOI: 10.54254/2753-7064/40/20242244

5. Impact on worker power and society

Labor markets are often not competitive in the narrow sense defined by economists. Sharing productivity gains with workers will be determined not only by market forces but also by relative power among workers and employers [15]. And relative power, shows up quite often in tax and social policies and in many of the institutional arrangements that have privileged owners over workers. While some recent studies, such as Acemoglu and Restrepo [13], show that replacing AI tends to shift power towards capital by substituting for human labor, enabling AI can augment worker productivity and create new task categories, potentially strengthening labor's position. However, sociologists and economists are very critical of the various forms of capitalism we have now because in many capitalisms, workers simply do not have enough power. As Korinek and Stiglitz [4] argue that AI-driven automation has accelerated the trend of capital-biased technological change, exacerbating the asymmetry in bargaining power between workers and employers. Their research indicates that as AI systems become more capable of performing a wider array of tasks, the threat of technological unemployment serves as a powerful lever for capital in wage negotiations, even in sectors not directly affected by automation. This phenomenon, which they term the "AI-induced bargaining effect," contributes to wage stagnation and the declining labor share of national income observed in many developed economies.

As Karl Marx [30] argued, work provides more than just income; it offers interpersonal relationships, meaning, and the potential for self-realization. This raises a crucial question: if artificial intelligence were to eliminate the need for human labor, would workers find the same level of fulfillment and happiness they experienced through work? Keynes [31] posited that humans have evolved with instincts and impulses geared towards solving economic problems. If these problems were to be resolved, he suggested, humans might be deprived of their traditional purpose. Indeed, work is far too significant for individuals and society to be viewed merely as a curse, a commodity, or solely as a source of income. Jennie Brand [32] emphasizes that unemployed workers suffer numerous psychological losses. They experience a loss of meaning, often becoming depressed, losing the structure of daily life, and forfeiting the social relationships formed through work. The repercussions extend beyond the individual, affecting families and communities, and can even manifest in physical health issues. When unemployed, individuals often feel a sense of personal failure, contributing to their unhappiness. Furthermore, the widespread adoption of AI is likely to have profound existential implications. Cave and Dihal [33] explore how AI is reshaping human self-understanding and our place in the world. They argue that as AI systems become more advanced, they challenge traditional notions of human uniqueness and cognitive superiority, potentially leading to a reevaluation of what it means to be human in the age of intelligent machines.

6. Conclusion

The analysis of this article shows that AI-driven automation is reshaping the labor market beyond mere job displacement. While the skill-biased technological change (SBTC) paradigm remains relevant, the task-based approach provides a more nuanced understanding of labor market polarization. AI is creating a new landscape of 'winners' and 'losers' based on the complementarity or substitutability of human skills with AI capabilities. The Polanyi paradox and its 'revenge' highlight the evolving nature of task automation, suggesting a potential re-polarization of the labor market. This article also underscores the decoupling of wage growth from productivity gains, contributing to a declining labor share of national income and exacerbating income inequality. The "AI-induced bargaining effect" emerges as a critical factor, potentially undermining worker power even in sectors not directly impacted by automation.

DOI: 10.54254/2753-7064/40/20242244

The findings of this article underscore the need for proactive policy interventions to mitigate the potentially deleterious effects of AI on social equality. Policymakers must grapple with the challenge of fostering innovation while ensuring equitable distribution of its benefits. A multifaceted approach is required, encompassing education reform, labor market policies, and social safety net enhancements. Education systems must be reimagined to emphasize skills that complement rather than compete with AI, focusing on creativity, emotional intelligence, and complex problem-solving. Lifelong learning initiatives and reskilling programs should be prioritized to facilitate smoother labor market transitions. Labor market policies should aim to rebalance power dynamics between workers and employers, potentially through strengthening collective bargaining rights or exploring novel forms of worker representation in the AI era. Additionally, policymakers should consider progressive taxation of AI-derived capital gains to fund a more robust social safety net, potentially including universal basic income schemes. These measures could help address the 'excessive automation' phenomenon identified by Acemoglu and Restrepo, ensuring that AI deployment aligns with broader societal interests rather than narrow profit motives.

This article also reveals several avenues for future research. First, there is a pressing need for more granular, longitudinal studies tracking the evolving relationship between AI adoption and labor market outcomes across different sectors and skill levels. Such research could provide valuable insights into the long-term dynamics of the 'productivity effect' and 'reinstatement effect' of AI. Second, interdisciplinary research combining economics, sociology, and psychology could further explore the societal and existential implications of widespread AI adoption, building on the work of Cave and Dihal [33]. This could include investigations into the changing nature of work-derived meaning and social cohesion in an AI-dominated economy. Third, comparative studies examining AI's impact across different economic systems and cultural contexts could yield insights into more equitable models of technological integration. Finally, there is a critical need for research into novel economic paradigms that can reconcile technological progress with social equity, potentially drawing on concepts from ecological economics or post-scarcity theory [34]. It is worth noting that, as we pursue these research avenues, we're compelled to confront a stark reality: These are difficult days for the labor movement. While in the rich countries of the center of capitalism, labor is fighting to hold on to existing wages and benefits under a combined assault by capital and governments, conditions of workers at the periphery are even harsher.

References

[1] *Butler, S. (1863). Darwin among the machines. June, 13(1863), 205.*

[2] *Schwab, K. (2017). The fourth industrial revolution. Crown Currency.*

[3] *Bommasani, R., Hudson, D. A., Adeli, E., Altman, R., Arora, S., von Arx, S., ... & Liang, P. (2021). On the opportunities and risks of foundation models. arXiv preprint arXiv:2108.07258.*

[4] *Korinek, A., & Stiglitz, J. (2021). Artificial intelligence, globalization, and strategies for economic development. https://doi.org/10.3386/w28453*

[5] *Mokyr, J. (2018). Editor's introduction: The New Economic History and the Industrial Revolution. In Routledge eBooks (pp. 1–127). https://doi.org/10.4324/9780429494567-1*

[6] *Hassard, J., Hogan, J., & Rowlinson, M. (2001). From labor process theory to critical management studies. Administrative Theory & Praxis, 23(3), 339–362. https://doi.org/10.1080/10841806.2001.11643531*

[7] *Braverman, H. (1998). Labor and monopoly capital: The degradation of work in the twentieth century. nyu Press.*

[8] *Brynjolfsson, E., & McAfee, A. (2014). The second machine age: Work, progress, and prosperity in a time of brilliant technologies. WW Norton & Company.*

[9] *Dorfman, R., Samuelson, P. A., & Solow, R. M. (1987). Linear programming and economic analysis. Courier Corporation.*

[10] *Gordon, J. (2016). Australia's productivity: Some insights from productivity analysis. Asia & the Pacific Policy Studies, 3(2), 173-186.*

[11] *Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation? Technological Forecasting and Social Change, 114, 254–280. https://doi.org/10.1016/j.techfore.2016.08.019*

[12] García, C. J., González, W. D., & Rivera, T. (2024). Robots at work in emerging developing countries: How bad could it be? Labour Economics, 87, 102512. https://doi.org/10.1016/j.labeco.2024.102512
[13] Acemoglu, D., & Restrepo, P. (2021). Demographics and Automation. The Review of Economic Studies, 89(1), 1–44. https://doi.org/10.1093/restud/rdab031
[14] Acemoglu, D., & Restrepo, P. (2019). Automation and New Tasks: How technology displaces and reinstates labor. The Journal of Economic Perspectives, 33(2), 3–30. https://doi.org/10.1257/jep.33.2.3
[15] Zysman, L. D. T. J. (2022). Automation, AI & Work. American Academy of Arts & Sciences. https://www.amacad.org/publication/daedalus/automation-ai-work
[16] Acemoglu, D., & Autor, D. (2011). Skills, Tasks and Technologies: Implications for Employment and Earnings. In Handbook of labour economics (pp. 1043–1171). https://doi.org/10.1016/s0169-7218(11)02410-5
[17] Dixon, J., Hong, B., & Wu, L. (2021). The Robot Revolution: Managerial and employment Consequences for Firms. Management Science, 67(9), 5586–5605. https://doi.org/10.1287/mnsc.2020.3812
[18] Brynjolfsson, E., Mitchell, T., & Rock, D. (2018). What can machines learn and what does it mean for occupations and the economy? AEA Papers and Proceedings, 108, 43–47. https://doi.org/10.1257/pandp.20181019
[19] Autor, D. H., Levy, F., & Murnane, R. J. (2003). The skill Content of Recent Technological Change: An Empirical Exploration. The Quarterly Journal of Economics, 118(4), 1279–1333. https://doi.org/10.1162/003355303322552801
[20] Goos, M., Manning, A., & Salomons, A. (2014). Explaining job polarization: Routine-Biased technological change and offshoring. American Economic Review, 104(8), 2509–2526. https://doi.org/10.1257/aer.104.8.2509
[21] Biggart, N. W. (2002). Readings in Economic Sociology. In Wiley eBooks. https://doi.org/10.1002/9780470755679
[22] Polanyi, M. (2009). The tacit dimension. In Knowledge in organisations (pp. 135-146). Routledge.
[23] Autor, D. (2022). The labor market impacts of technological change: From unbridled enthusiasm to qualified optimism to vast uncertainty. National Bureau of Economic Research. https://doi.org/10.3386/w30074
[24] Lane, M., & Saint-Martin, A. (2021). The impact of Artificial Intelligence on the labour market. OECD Social Employment and Migration Working Papers. https://doi.org/10.1787/7c895724-en
[25] Hoffmann, F., Lee, D. S., & Lemieux, T. (2020). Growing income inequality in the United States and other advanced economies. The Journal of Economic Perspectives, 34(4), 52–78. https://doi.org/10.1257/jep.34.4.52
[26] Autor, D. H., & Salomons, A. (2018). Is automation Labor-Displacing? Productivity growth, employment, and the labor share. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3222438
[27] D'Adamo, C. a. &. G. (2017). Inequality and Structural Reforms: Methodological Concerns and Lessons from Policy. ideas.repec.org. https://ideas.repec.org/p/euf/dispap/071.html
[28] Moll, B., Rachel, L., & Restrepo, P. (2021). Uneven Growth: Automation's impact on income and wealth inequality. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3801089
[29] McKinsey Global Institute. (2018). Skill shift: Automation and the future of the workforce. Washington, DC: McKinsey & Company.
[30] Marx, K. (2000). Karl Marx: selected writings. Oxford University Press, USA.
[31] Keynes, J. M. (1930). Economic possibilities for our grandchildren. In Essays in persuasion (pp. 321-332). London: Palgrave Macmillan UK.
[32] Brand, J. E. (2015). The Far-Reaching impact of job loss and unemployment. Annual Review of Sociology, 41(1), 359–375. https://doi.org/10.1146/annurev-soc-071913-043237
[33] Cave, S., & Dihal, K. (2019). Hopes and fears for intelligent machines in fiction and reality. Nature Machine Intelligence, 1(2), 74–78. https://doi.org/10.1038/s42256-019-0020-9
[34] Mizerák, M. (2019). Comparison of transitional theories to post-scarcity in science-fiction literature. European Journal of Business Science and Technology, 5(1), 107-123.http://dx.doi.org/10.11118/ejobsat.v5i1.144.

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242261

Effects of Homophone Priming on the Decision-Making in Perceptual Color Recognition of Mandarin Speakers

Boyang Li[1,a,*]

[1]*Webb Schools of California, 1175 Baseline Road, Claremont, United States of America*
a. bli@webb.org
**corresponding author*

Abstract: This study delves into the nuanced interactions between language, cognition, and perception by examining the impact of homophones on decision-making and perceptual color recognition among native Mandarin speakers. Drawing on theories of linguistic relativity and cognitive processing, this research hypothesized that homophonic primes would subtly influence both decision-making processes and color recognition tasks. Participants were assigned at random to surveys where they were unknowingly exposed to stimuli with and without homophonic primes before engaging in color recognition tasks involving subtle shade differentiations. Contrary to initial expectations, statistical analysis revealed no significant differences in decision-making accuracy between conditions, suggesting that homophones may not overtly affect conscious decision-making processes in our bilingual cohort. However, intriguing variations emerged in the perceptual color recognition task, where participants exposed to homophonic primes showed tendencies to perceive color shades more similarly compared to those in the control condition. This finding implies a potential cognitive load effect or subtle priming influence on perceptual categorization tied to linguistic structures. The implications of these findings challenge traditional views on language's role in shaping cognitive processes, highlighting the complexity of how linguistic structures such as homophones may operate at subconscious levels. The study contributes to ongoing debates in cognitive science and linguistics by underscoring the need for nuanced approaches to understanding cross-linguistic cognitive mechanisms. Future research should further explore the Whorfian hypothesis within bilingual contexts, considering additional variables such as language proficiency and cultural influences to elucidate the intricate relationship between language and cognition.

Keywords: Homophones, decision-making, color recognition, Mandarin speakers.

1. Introduction

Language, as a fundamental tool of human communication, not only conveys meaning but also shapes cognition and perception. Psycholinguistic theories, like the Whorfian hypothesis, suggest that a language's structure and vocabulary can impact how speakers perceive and interact with their environment. This hypothesis posits that linguistic categories and structures subtly guide thought processes, influencing everything from basic sensory perception to complex decision-making [1].

In the context of bilingualism and cognitive processing, this study explores the intriguing phenomenon of homophones—words are pronounced similarly but have different meanings—in

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242261

Mandarin and English. Specifically, it investigates how these homophones may prime certain concepts and influence decision-making processes among native Mandarin-speaking people.

Davis and Herr proposed that homophones can subtly influence subconscious decisions, suggesting a direct link between linguistic structures and cognitive responses, and conducted experiments to investigate the influence of homophones on subconscious decision-making [2]. Participants were exposed to brief presentations of homophonic primes such as "bye" and "buy" before engaging in decision tasks involving financial choices. These primes were designed to activate subconscious associations related to either departure ("bye") or purchasing ("buy"). Participants were then asked to make financial decisions, such as choosing between spending or saving money.

The results demonstrated a subtle but significant effect: participants exposed to the homophonic prime "buy" were more inclined to make decisions favoring spending compared to those exposed to unrelated primes or no primes. This effect suggests that homophones can activate associated concepts subconsciously, influencing decision-making processes even when participants are unaware of the priming. Davis and Herr argued that linguistic structures, through their phonetic similarity and semantic associations, can shape automatic cognitive responses and behavioral tendencies. Their research contributes to understanding how language influences cognitive processes and decision-making, highlighting the subtle yet impactful role of homophones in shaping human behavior.

However, recent research may have challenged these findings, particularly in the context of Mandarin Chinese, a logographic language with a complex character-based system. Unlike alphabetical languages such as English, Mandarin's structure often requires multiple characters to convey a single concept, potentially altering how homophones are processed and perceived [3].

The present study builds upon this foundation by examining whether homophones embedded in Mandarin sentences influence color identification—a task that requires quick decision-making and visual perception. By comparing participants who were exposed to sentences containing homophones with those who were not, the study aims to elucidate how cognitive load and linguistic structures interact to shape decision-making processes.

Psycholinguistic theories emphasize that language not only reflects but also shapes cognitive processes [4]. Understanding how homophones impact decision-making in bilingual contexts contributes to broader insights into language processing and its implications for cognitive psychology. By integrating findings from prior research and theoretical frameworks, this study aims to enhance our understanding of how language shapes perception and decision-making across diverse linguistic systems.

2. Homophones

The comprehension of natural speech involves the analysis of a variety of linguistic information, including the lexical, phonetic, pragmatic, semantic, and syntactic aspects of a spoken sentence [5]. In this assembly, word recognition significantly influences the perception of spoken language because words provide separate pieces of information that contribute to the representation of the meaning and the conceptual interpretation of the sentence to be understood. The presence of homophones, however, complicates such cognitive procedures. For instance, the words “there” and “their” respectively indicate a reference to a specific place and a sense of belonging to a group of people yet are all pronounced very similarly in the English language. Homophones are the subject of extensive psycholinguistic debates, where they are argued to be words that share a one-word form but represent multiple meanings or should be regarded as two different words that share no dictionary connections [6]. In the context of this study, homophones are defined to be words that are pronounced similarly but retain different meanings [7]. For such potentially ambiguous words, the listener must use contextual information to determine the correct denotation. Please remember that all the papers must be in English and without orthographic errors.

DOI: 10.54254/2753-7064/40/20242261

Dominance, the inference of the meaning of a word based on the frequency of its usage, is one factor discovered to be important in the interpretation of individual ambivalent sentences [8]. It is generally believed that a lexically ambiguous word can be understood based on the specific context provided. However, studies contend that both the subordinate meaning (activation by context) and the dominant meaning (activation by frequency) of a homophone compete to be determined as part of the intended message of the sentence. The more frequent, dominant meaning of a homophone in a neutral sentence is activated faster and persists longer than subordinate meanings, and thus sentence contexts that support subordinate meanings take more time to interpret [9-11].

2.1. Homophone Suppression

When encountering homophones, readers initially activate multiple meanings automatically but then intentionally suppress subordinate meanings in favor of the dominant interpretation—a process known as homophone suppression. Studies show that such cognitive processes determine and then exclude the meaning that does not suit the context [11-14]. To initiate homophone suppression, however, one must dedicate cognitive resources to actively exert control over the competition for selection between the dominant and subordinate homophone denotations. Therefore, this cognitive process relies on available mental resources, which can sometimes limit the efficiency of homophone suppression. As a result, contextually inappropriate meanings may persist in memory [2, 15].

Automatic processes, such as retrieving the dominant word meaning from memory while reading, inherently require fewer cognitive resources compared to controlled processes [2]. The strength of connections among phonological nodes, as proposed in Node Structure Theory, where "priming serves as a subthreshold excitation preparing a node for activation or retrieval," determines the speed and magnitude of priming that facilitates the activation of the phonology associated with the target word [16]. In this study's context, priming refers to the phenomenon where recent exposure to a stimulus enhances the processing of a similar stimulus later on [17]. Such cognitive resources are a significant factor contributing to the attainability of information in memory. Therefore, if someone experiencing weak connections among phonological nodes reads a homophone, the dominant and subordinate meanings should be simultaneously activated, but the incorrect meaning may not be effectively suppressed.

2.2. Homophone Priming

Research suggests that homophones in English may cause people to link one to another subconsciously. Davis and Herr found a statistically significant effect of homophones on subconscious decision-making, though the effect size was moderate [2]. Participants exposed to the homophonic prime "buy" were more likely to make decisions favoring spending compared to those exposed to unrelated primes or no primes. While the effect was notable, it was not overwhelmingly large, indicating that homophones influenced decision-making tendencies to a discernible extent but did not completely determine participants' choices. The study's findings suggest that homophones can subtly prime associated concepts and influence behavior, highlighting the nuanced ways in which linguistic structures can affect cognitive processes and decision-making outcomes. More specifically, homophone priming occurs when phonologically similar words coactivate regardless of being contextually irrelevant [18]. Once activated, such contextually unsuitable meanings may remain in memory, thereby subliminally biasing behavior and evaluations [15]. Findings that support homophone priming include cohort theory, which proposes that “a cohort of all the words beginning with a particular sound sequence will be activated during the initial stage of the word recognition process” [19]. However, it may be important to note that individual cognition and task difficulty fluctuate in homophone priming, the effect of which is still undetermined on bilinguals [18].

DOI: 10.54254/2753-7064/40/20242261

Bilinguals could experience stronger priming because processing the second language depletes cognitive resources that homophone suppression relies upon or weaker priming because of less efficient lexical processing.

2.3. Hypothesis

I propose that when homophone suppression fails to deactivate contextually unsuitable dominant homophone meanings, homophone priming may occur. According to previous studies regarding the priming of homophones, a cognitive load reduces the capability of suppressing the alternate meaning of the homophone [2]. In other words, when homophone suppression fails, the unsuitable meaning remains in memory and influences subsequent behaviors, which include personality traits or goals, choices, and evaluations in the same way the intended meaning of the homophone would [15, 20]. This hypothesis was already verified when Davis and Herr demonstrated how homophone priming could cause reading “bye” to activate meanings associated with irrelevant meanings, such as “buy,” and thereby cause an increased likelihood of purchasing, the copy of Davis and Herr's (see figure 1) [2].

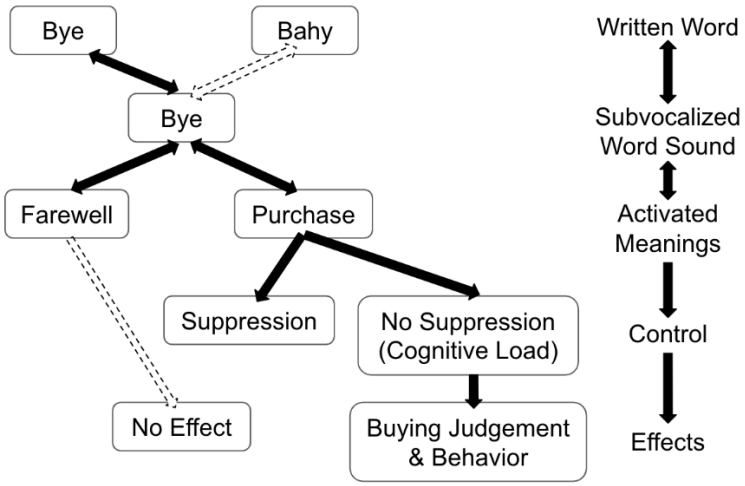


Figure 1: Process Diagram of How Reading "bye" May Influence Buying Behavior

Interestingly, the priming of homophones to behavior is still an ongoing debate. A study attempting to verify models of the lexicon predicting that recognition of words stimulates the activation of phonologically related words has resulted in failure. The results indicate that either the lexicon is not organized such that phonological similarity does not stimulate priming, or that the cognitive processing of phonologically similar words is not impactful in regard to visual lexical decisions [21]. Another study investigating the effects of phonological priming on tip-of-the-tongue (TOT) experiences corroborated Davis and Herr's findings. The study concluded that its results support the transmission deficit model, indicating that phonologically similar words strengthen connections among phonological representations, thereby contributing to TOT phenomena [16].

As a bilingual and one tormented by frequent instances of TOTs, whether this phenomenon should be much more common in Mandarin compared to English, and which has significantly fewer homophones will be explored in this research.

3. An Introduction to Chinese

Numerous papers have emerged recently suggesting the non-arbitrariness between the phonological expressions and meaning of English, offering evidence in favor of an adaptive cognitive heuristic that

DOI: 10.54254/2753-7064/40/20242261

enables listeners to utilize non-arbitrary mappings between word form and meaning [22-24]. Such assumptions are also reasonable in the context of Mandarin, and perhaps even more justified.

While English characters represent a phoneme individually or by combination, Chinese is a logographic language in which each written character represents one morpheme [25]. The majority of Chinese characters are compound characters, typically incorporating a semantic radical that gives a picturesque implication of the word's meaning [26]. Radicals can stand independently as a character of their own, within another character, or only within another character. For example, the semantic radical 马 (horse) is an independent character that can also be incorporated in the character 骑 (ride), whereas the radical 灬 (of or relating to fire) in the character 燕 (swallow) is not an independent character [27].

As Chinese is a monosyllabic, tonal language, any small change in tonal pronunciations of a syllable alters the meaning of a character. A useful illustration can be presented using 'pinyin', Mandarin's standard Romanisation system. The system utilizes 21 onsets and 39 rimes (part of a syllable that contains a word's vowel and the following consonants) consisting of 26 letters (a-z) in four distinct tones to simulate Mandarin's complex pronunciation [28]. For example, the syllable /ji/ has a plethora of individual meanings in the four tones. 鸡 jī, with a flat tone, means chicken; 吉 jí, with a rising tone, means fortune; 挤 jǐ, with an inflected tone, is the verb "to squeeze", and 记 jì, with a falling tone, is the verb "to record". Not mentioned are characters of the exact same pronunciation for each tone but with another different meaning and written structure. Having so many characters results in the pervasiveness of homophones in Mandarin, leading to most Mandarin morphemes having up to five homophones [29].

Mandarin homophony is also sporadic. An examination of the distribution of homophony demonstrates arbitrary homophone clustering, with some words having much more homophones than others [30]. In common language, words such as 谬 miu 'preposterous', used in the phrase 荒谬 huang miu, an adjective describing preposterousness, have no homophones and no words associated with miū, miú, and miǔ, the other three differences in tone. In contrast, the word 鸡 ji 'chicken' not only represents a specific meaning for each tonal variation but retains 13.5 homophones for every tonally specified syllable [29]. In consideration of homophone dominance, this raises the issue regarding which homophone to prime, and how one meaning's frequency can impact the participant's answer.

4. Methods

4.1. Participants

Participants were all native Mandarin speakers in China. A total of 612 people participated in the survey involving sentence priming, while 509 people participated in the control group with no sentence priming.

4.2. Materials

The study used a set of slides designed to present sentences in Mandarin followed by a color, in which participants had two choices as to how to define it. The sentences were crafted to include a homophone that could be related to the color presented. Measures were taken to ensure that the homophone and the color did not have an associative meaning outside of their phonetic similarity. For instance, homophones with radicals indicating color were excluded.

DOI: 10.54254/2753-7064/40/20242261

4.3. Procedure

There were two different surveys to choose from: the survey with a sentence that primes to a color and a survey with no sentence, which only asked participants to define the color presented. Participants could choose to take either study, but could not take both. The sentence group read two Mandarin sentences before identifying the color displayed on the next slide, while the no-sentence group directly identified the color. The slides for the sentence group displayed sentences with homophones strategically embedded as various parts of speech (nouns, verbs, adjectives, etc.). The sentences were concise and clear, designed to ensure easy comprehension for the participants. Participants were instructed to take their time reading the sentences but to choose the color as quickly as possible. Each color was designed to be ambiguous and challenging to differentiate from another similar color, covering the entire screen to prevent any other visual color references. This setup aimed to test if the cognitive load from processing the sentences would influence their color perception.

4.4. Data Collection

The primary data collected were the choices of colors by the participants. The survey results showed the percentage of participants who identified each color correctly or incorrectly, both with and without sentence priming. This comparison helped determine if the sentence containing a homophone influenced their color choice.

5. Analysis

The data were analyzed by comparing the color identification accuracy between the sentence and no-sentence groups. The hypothesis was that the cognitive load from processing the sentences would lead to different color perceptions, potentially causing errors due to homophone priming.

By isolating the impact of homophone presence in sentences and controlling for associative meanings, the study aimed to investigate the influence of homophone priming on decision-making in a bilingual context. The results were analyzed to see if the hypothesis held true, considering the distinct cognitive processes involved in reading and understanding Mandarin characters compared to phonetic languages like English.

5.1. Homophone Priming Effect

The data revealed that in the presence of a Mandarin sentence containing a homophone, participants' color identification was notably influenced. For instance, when primed with "黄" (huáng), which means "emperor" but is also pronounced the same as "yellow," participants were more inclined to identify the color as yellow.

As shown in Table 1, the results indicated a higher percentage of participants selecting colors that were homophones of the words in the sentences, in comparison to the control group. For example, with sentences containing the homophone for "orange" (橙, chéng), 43.46% identified the color as orange compared to 22.4% in the control group.

Table 1: Survey results with priming(top) compared to survey results with no priming(bottom) Order from left to right

	Sentence(612 participants)	No sentence(509 participants)	

DOI: 10.54254/2753-7064/40/20242261

Table 1: (continued).

	Orange	Yellow	Orange	Yellow	Adj, prime orange
	43.46 %	56.54 %	22.4%	77.6%	
	Red	Pink	Red	Pink	Noun, prime red
	93.3%	6.7%	95.07 %	4.93%	
	Green	Yellow	Green	Yellow	Noun, prime green
	48.2%	51.8%	40.08 %	59.92 %	
	Blue	Purple	Blue	Purple	Verb, prime blue
	37.25 %	62.75 %	43.42 %	56.58 %	
	Yellow	Orange	Yellow	Orange	No priming
	46.24 %	53.76 %	20.83 %	79.17 %	

5.2. Cognitive Load and Response

Participants in the no-sentence group clearly distinguished between two types of yellow oranges, the first being lighter than the second. However, the group that had the sentence collectively agreed that they were the same color. This likely indicates that the participants thought they were given the same color twice. This not only suggests they experienced cognitive load and relied on instinctual responses but also may invalidate the orange columns.

The data implies that when under cognitive load, participants might not process the homophones as distinct stimuli, leading to less differentiation between similar colors. This observation aligns with the theory that cognitive resources are taxed when processing complex information, resulting in less precise responses.

5.3. Discrepancies with Existing Research

According to Davis and Herr's logic, a survey with priming should always yield a higher identification rate of the primed color compared to a no-sentence survey. However, this was not consistently observed in the study, as seen with the colors red and blue. The percentage for "red" (红, hóng) was

DOI: 10.54254/2753-7064/40/20242261

93.3% with priming compared to 95.07% in the control group, indicating minimal influence from priming. This inconsistency suggests that the survey results are more complex and do not fully support Davis and Herr's research on homophone priming effects on subconscious decisions. Their theory posits that homophones can subtly influence human decision-making, but the current study provides evidence that this might not apply to Mandarin Chinese.

The discrepancy between the results of this study and those proposed by Davis and Herr can be attributed to the structural differences between English and Mandarin, which are central to the Whorfian hypothesis of linguistic relativity. This hypothesis proposes that the structure and vocabulary of a language influence how its speakers interpret the world.

English, as an alphabetical language, typically features a direct correspondence between words and their meanings. Each word generally carries a single meaning, allowing for straightforward associations and potentially stronger priming effects from homophones.

In contrast, Mandarin Chinese is a logographic language where characters often represent whole words or morphemes rather than individual sounds. Characters in Mandarin can have multiple meanings and pronunciations based on context, necessitating compound words to convey specific meanings. For example, the character "行" (xíng) can mean "to walk," "okay," or "line," depending on its usage and accompanying characters. In addition, Mandarin characters often have multiple meanings and pronunciations based on context. While English words typically convey one meaning per word, Mandarin speakers sometimes require compound words to communicate a single meaning. For example, 荒谬 (huāng miù) is not contextually meaningful if separated and only means "preposterous" when used together. This complexity in Mandarin might reduce the effectiveness of homophone priming observed in English.

This structural complexity in Mandarin may diminish the effectiveness of homophone priming observed in English. Mandarin speakers may rely more on contextual clues and additional characters to disambiguate meanings, reducing the direct influence of a single homophone on decision-making processes. Consequently, in the study conducted with Mandarin-speaking participants, the expected priming effects on color identification may have been mitigated due to the language's inherent structure requiring deeper semantic processing.

By exploring these structural differences and their implications for cognitive processes, this study contributes to our understanding of how language shapes perception and decision-making. It highlights the nuanced ways in which linguistic structures influence cognitive operations, supporting the Whorfian hypothesis within the specific context of homophone priming and bilingual cognition.

5.4. Expansion on the Whorfian Hypothesis

The theory of linguistic relativity proposes that the way language is structured influences how its speakers perceive and think about the world. Based on this hypothesis, individuals who speak varying languages perceive the world differently due to the particular linguistic categories and structures they employ. In the context of homophone priming, this theory can help explain why English speakers might be more susceptible to such priming effects compared to Mandarin speakers.

In English, the alphabetical and relatively linear nature of the language more often allows for direct one-to-one correspondence between words and their meanings compared to Mandarin. The direct correlation implies that homophones can readily trigger associated ideas in the minds of English speakers. In different contexts, the word "bank" can evoke thoughts of either an institution of finance or a riverfront. This kind of priming can subtly influence decision-making and perception, as suggested by Davis and Herr's research.

Mandarin, on the other hand, is a logographic language, meaning that its characters often represent whole words or morphemes rather than individual sounds. Additionally, Mandarin characters can

DOI: 10.54254/2753-7064/40/20242261

have multiple meanings and pronunciations, depending on the context. This complexity can make homophone priming less straightforward and less effective. For instance, the character "行" (xíng) can mean "to walk," "okay," or "line," among other things, depending on its usage [3]. The need for compound words to convey specific meanings further complicates the potential for homophone priming in Mandarin.

Moreover, Mandarin speakers might rely more on context and additional characters to disambiguate meanings, reducing the impact of a single homophone. This context-dependent nature of Mandarin could result in weaker priming effects compared to English, where homophones can more directly activate related concepts without additional contextual information.

In summary, the Whorfian hypothesis suggests that language structure influences cognitive processes, including susceptibility to homophone priming. The more direct word-meaning relationships in English make its speakers more prone to such priming effects, whereas the complex and context-dependent nature of Mandarin mitigates these effects. This insight underscores the significance of considering linguistic and cultural contexts in cognitive research and supports the idea that language can subtly shape our perception and behavior.

5.5. Methodologies Differences

Davis and Herr utilized paragraphs ending in "bye" to prime "buy," a method aimed at activating semantic networks related to purchasing decisions. This approach introduces a subjective element, as participants' interpretations of the paragraph's content and its influence on subsequent decisions can vary widely [2]. In contrast, this study employed color perception as the priming stimulus, focusing on a more perceptually objective factor. Participants were asked to distinguish between subtle shades of colors, aiming to assess how perceptual priming might influence decision-making in a non-verbal context. Furthermore, while Davis and Herr restricted their sample to students from a single university, this study included participants of all ages from various regions of Guangdong, China. This broader demographic diversity introduces cultural and experiential variability, potentially affecting how participants interpret and respond to experimental stimuli. Such methodological differences highlight the importance of considering both subjective and objective priming mechanisms across diverse participant groups to comprehensively understand cognitive processes influenced by linguistic and non-linguistic stimuli.

5.6. Questioning the Whorfian Hypothesis

In exploring the discrepancies between this study and Davis and Herr's findings, it becomes pertinent to question the underlying assumptions of the Whorfian hypothesis. Davis and Herr suggest that language, through homophonic priming, can significantly influence decision-making processes by activating specific linguistic associations. However, insights from John McWhorter's "The Language Hoax" challenge the extent of linguistic relativity's impact on cognitive processes. McWhorter argues that while experimental studies may reveal subtle linguistic effects in controlled settings, their practical significance in everyday decision-making remains minimal [31]. McWhorter's critique suggests that the observed discrepancies between studies could stem from the limited practical impact of linguistic relativity on real-world decision-making contexts [31]. By questioning the presumed influence of language on cognitive processes, this study encourages a critical reevaluation of how linguistic and non-linguistic factors interact to shape human cognition and behavior.

6. Conclusion

The findings suggest that homophone priming can influence word recognition and color identification in bilinguals, but this effect may be contingent on the language's structural characteristics. The lack

DOI: 10.54254/2753-7064/40/20242261

of strong support for Davis and Herr's theory in Mandarin highlights the need to consider language-specific factors when studying cognitive processes. This study refutes Davis and Herr's proposal that homophones can subtly influence subconscious decisions, at least within the context of Mandarin Chinese. While there isn't enough evidence to completely dismiss their theory, the results suggest it might not apply universally across different languages. This highlights the importance of linguistic context in cognitive research. This study also offers multiple explanations for its discrepancies with Davis and Herr. Firstly, differences in language structure, as posited by the Whorfian hypothesis, suggest that linguistic differences could shape how individuals perceive and respond to priming stimuli. This theoretical perspective implies that varying linguistic frameworks may underlie the observed differences between studies.

Secondly, methodological disparities play a significant role. Davis and Herr used paragraphs ending in "bye" to prime "buy," activating semantic networks associated with purchasing decisions. In contrast, this study employed color perception as a priming stimulus, focusing on perceptual rather than semantic activation. These methodological choices can profoundly influence participant responses and study outcomes.

Lastly, insights from John McWhorter's "The Language Hoax" challenge the notion that language significantly shapes thought. McWhorter argues that while linguistic relativity may have minimal effects in controlled settings, its practical impact on everyday decision-making is minimal. Therefore, Davis and Herr's argument that linguistic priming influences decision-making may be overstated, given language's limited cognitive effects.

This study offers insights into how homophone priming influences word recognition and color identification among Mandarin speakers. The presence of homophones in sentences can influence subsequent behavior, such as color identification, by activating dominant meanings. The impact of cognitive load on the homophone suppression process results in varying efficiency levels. This research refute the idea proposed by Davis and Herr that homophones can subtly influence subconscious decisions in all linguistic contexts. The primary reason for this discrepancy appears to be the structural differences between alphabetical English and logographic Mandarin. English's straightforward word-meaning correspondence contrasts with Mandarin's need for compound words to convey specific meanings, affecting the effectiveness of homophone priming.

Future research should continue to explore this topic, especially by conducting similar studies with different linguistic contexts. It is crucial to consider the cognitive load and language structure when designing experiments to understand the broader implications of homophone priming. Additionally, more studies on the effects of homophones in English and other languages could provide further insights into the universality of these cognitive processes. This expanded explanation underscores the importance of considering language-specific factors when studying cognitive phenomena like homophone priming. It emphasizes that differences in linguistic structure between English and Mandarin can lead to varying effects on decision-making processes, aligning with the theoretical framework of linguistic relativity proposed by Whorf. Future research should continue to investigate these dynamics across different languages and cultural contexts to further illuminate the intricate relationship between language and cognition.

References

[1] *Whorf, B. L. (1956). Language, thought, and reality: Selected writings of Benjamin Lee Whorf (J. B. Carroll, Ed.). MIT Press.*

[2] *Davis, D. F., & Herr, P. M. (2014). From Bye to Buy: Homophones as a Phonological Route to Priming. Journal of Consumer Research, 40(6), 1063–1077. https://doi.org/10.1086/673960*

[3] *Yang, H., Perfetti, C. A., & Tan, L. H. (2017). The role of character density in Mandarin word recognition: Evidence from eye movements. Journal of Experimental Psychology: Learning, Memory, and Cognition, 43(5), 743-763. https://doi.org/10.1037/xlm000034*

[4] Gleitman, L., & Papafragou, A. (2017). Language and thought. In E. M. Goldstein (Ed.), Cognitive Psychology: Connecting Mind, Research, and Everyday Experience (4th ed., pp. 270-308). Cengage Learning.
[5] Slowiaczek, L. M., Nusbaum, H. C., & Pisoni, D. B. (1987). Phonological Priming in Auditory Word Recognition. Journal of Experimental Psychology. Learning, Memory, and Cognition, 13(1), 64–75. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3499951/
[6] Biedermann, B., Blanken, G., & Nickels, L. (2002). The representation of homophones: Evidence from remediation. Aphasiology, 16(10-11), 1115–1136. https://doi.org/10.1080/02687030244000545
[7] Adha, R., & Astri, A. (2020). Students' ability in understanding homophone in English. JL3T (Journal of Linguistics, Literature and Language Teaching), 6(1), 31–54. https://doi.org/10.32505/jl3t.v6i1.1884
[8] Rodd, J. M., Lopez Cutrin, B., Kirsch, H., Millar, A., & Davis, M. H. (2013). Long-term priming of the meanings of ambiguous words. Journal of Memory and Language, 68(2), 180–198. https://doi.org/10.1016/j.jml.2012.08.002
[9] Simpson, G. B., & Burgess, C. (1985). Activation and selection processes in the recognition of ambiguous words. Journal of Experimental Psychology: Human Perception and Performance, 11, 28–39.
[10] Simpson, G. B., & Krueger, M. (1991). Selective access of homograph meanings in sentence context. Journal of Memory and Language, 30, 627–643.
[11] Gernsbacher, Morton Ann, Kathleen R. Varner, and Mark E. Faust(1990), "Investigating Differences in General Comprehension Skill," Journal of Experimental Psychology: Learning, Mem-ory, and Cognition, 16 (3), 430–45.
[12] Gernsbacher, Morton Ann, and Mark E. Faust (1991), "The Mech-anism of Suppression: A Component of General Comprehen-sion Skill," Journal of Experimental Psychology: Learning,Memory, and Cognition, 17 (2), 245–62.
[13] Kintsch, Walter (1988), "The Role of Knowledge in Discourse Comprehension: A Construction-Integration Model," Psycho-logical Review, 95 (2), 163–82.
[14] Lukatela, Georgije, and Michael T. Turvey (1994a), "Visual LexicalAccess Is Initially Phonological. 1. Evidence from AssociativePriming by Words, Homophones, and Pseudohomophones,"Journal of Experimental Psychology: General, 123 (2),107–28.— (1994b), "Visual Lexical Access Is Initially Phonological.2. Evidence from Phonological Priming by Homophones andPseudohomophones," Journal of Experimental Psychology:General, 123 (4), 331–53.
[15] Inhoff, Albrecht W., Cynthia Connine, Briana Eiter, Ralph Radach, and Dieter Heller (2004), "Phonological Representation ofWords in Memory during Sentence Reading," PsychonomicBulletin and Review, 11 (2), 320–35.
[16] James, L. E., & Burke, D. M. (2000). Phonological priming effects on word retrieval and tip-of-the-tongue experiences in young and older adults. Journal of Experimental Psychology: Learning, Memory, and Cognition, 26(6), 1378–1391. https://doi.org/10.1037//0278-7393.26.6.1378
[17] Ledoux, K., Traxler, M. J., & Swaab, T. Y. (2007). Syntactic Priming in Comprehension. Psychological Science, 18(2), 135–143. https://doi.org/10.1111/j.1467-9280.2007.01863.x
[18] Thoma, D. (2023). Homophone priming. Osf.io. https://osf.io/6fvyw/
[19] Marslen-Wilson WD, Welsh A. Processing interactions and lexical access during word recognition in continuous speech. Cognitive Psychology. 1978;10:29–63. [Google Scholar]
[20] Higgins, Edward T. (1996), "Knowledge Activation: Accessibility, Applicability, and Salience," in Social Psychology: Handbook of Basic Principles, ed. E. Tory Higgins and Arie W. Kruglanski, New York: Guilford Press, 133–68.
[21] Martin, R. C., & Jensen, C. R. (1988). Phonological priming in the lexical decision task: A failure to replicate. Memory & Cognition, 16(6), 505–521. https://doi.org/10.3758/bf03197052
[22] Monaghan, P., Shillcock, R. C., Christiansen, M. H., & Kirby, S. (2014). How arbitrary is language? Philosophical Transactions of the Royal Society B: Biological Sciences, 369(1651). https://doi.org/10.1098/rstb.2013.0299
[23] Dingemanse, M., Blasi, D. E., Lupyan, G., Christiansen, M. H., & Monaghan, P. (2015). Arbitrariness, Iconicity, and Systematicity in Language. Trends in Cognitive Sciences, 19(10), 603–615. https://doi.org/10.1016/j.tics.2015.07.013
[24] Reilly, J., Hung, J., & Westbury, C. (2016). Non-Arbitrariness in Mapping Word Form to Meaning: Cross-Linguistic Formal Markers of Word Concreteness. Cognitive Science, 41(4), 1071–1089. https://doi.org/10.1111/cogs.12361
[25] Shu H., Anderson R. C. (1997). Role of radical awareness in the character and word acquisition of Chinese children. Read. Res. Q. 32, 78–89. 10.1598/RRQ.32.1.5 [CrossRef] [Google Scholar]
[26] Chen Y. P., Allport D. A., Marshall J. C. (1996). What are the functional orthographic units in Chinese word recognition: the stroke or the stroke pattern? Q. J. Exp. Psychol. 49A, 1024–1043. 10.1080/713755668 [CrossRef] [Google Scholar]
[27] Kuo, L.-J., Kim, T.-J., Yang, X., Li, H., Liu, Y., Wang, H., Hyun Park, J., & Li, Y. (2015). Acquisition of Chinese characters: the effects of character properties and individual differences among second language learners. Frontiers in Psychology, 6. https://doi.org/10.3389/fpsyg.2015.00986

DOI: 10.54254/2753-7064/40/20242261

[28] *Xiao, H., Xu, C., & Rusamy, H. (2020). Pinyin Spelling Promotes Reading Abilities of Adolescents Learning Chinese as a Foreign Language: Evidence From Mediation Models. Frontiers in Psychology, 11. https://doi.org/10.3389/fpsyg.2020.596680*

[29] *Huff, C. L. (2017). A Study of Mandarin Homophony (Doctoral dissertation, Hertford College). Retrieved from https://ora.ox.ac.uk/objects/uuid:1b0bcc47-dd35-4108-9219-6616f82973ae*

[30] *Da, J. (2007). Chinese text computing corpus. http://lingua.mtsu.edu/chinese-computing/ copyright.html*

[31] *McWhorter, J. (2014). The Language Hoax. Oxford University Press.*

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242333

The Role of Motivation in Decision-Making and Underlying Neural Mechanism

Jiale Wei[1,a,*]

[1]*Shenghuazizhu Academy, Shanghai, China*
a. jialeweileo@ldy.edu.rs
**corresponding author*

Abstract: This paper presents crucial findings on how motivation, both internal and external, significantly influences decision-making processes at cognitive and neural levels. It highlights the role of reward anticipation and uncertainty in shaping decision-making behavior, particularly focusing on brain regions like the prefrontal cortex, amygdala, and dopaminergic pathways, which govern strategic and risk-related decisions. Studies involving psychiatric conditions, such as schizophrenia, and healthy individuals using fMRI reveal that increased motivation enhances decision-making strategies by activating frontal and parietal brain regions, while certain areas like the Orbitofrontal Cortex (OFC) show less involvement. Additionally, the essay explores the role of insight-driven internal motivation, showing that moments of sudden clarity ("AHA!" experiences) can elevate risk-taking behavior by stimulating the nucleus accumbens (NAcc), a key region involved in reward processing. The research also delves into strategic decision-making theories, emphasizing the balance between logical reasoning and instinctive, politically influenced decision-making processes within organizations. The essay concludes by underscoring the need for further research into the neural mechanisms linking motivation and decision-making, particularly the impact of neurotransmitter systems and individual differences in neural responsiveness to rewards. This deeper understanding could lead to enhanced strategies for improving decision-making outcomes across various fields, including healthcare, management, and personal decision-making, offering insights into the complex interplay between motivation, cognition, and neural activity.

Keywords: motivation, decision-making, neural mechanisms.

1. Introduction

The act of making decisions involves choosing the most suitable action from various options. Grasping the nuances of decision-making is vital as it affects various life facets, encompassing personal decisions and strategies for organization [1]. Understanding the mechanism underlying decision-making processes is widely applicable in areas such as psychology, management, economics, and sociology. Crafting impactful strategies and frameworks that elevate the caliber of decisions, streamline the distribution of resources, and elevate results in sectors such as healthcare, commerce, and governmental policy is crucial. For organizations, proficient decision-making is crucial, enhancing strategic planning, resource allocation, and more applications like initiatives in public

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242333

policy .Grasping the elements of decision-making for people can lead to improved personal decisions, also leading to a more knowledgeable populace and increased contentment.

Current studies in the field of motivation theories, as explored by Acquah and colleagues, a previous review mainly focuses on content theories pinpointing distinct factors that shape human actions [1]. Leading theoretical frameworks include Maslow's Needs Hierarchy, Herzberg's Theory of Motivation and Hygiene, Alderfer's ERG Theory, and McClelland's Theory of Achievement Need. Maslow's model suggests a tiered structure of necessities, starting with physical needs and advancing through stages of safety, affection/belonging, respect, and ultimately reaching self-fulfillment. Herzberg's hypothesis differentiates hygiene elements that avert discontent from motivators that enhance job contentment. The ERG Theory by Alderfer refines Maslow's hierarchy into three distinct categories: existence, relatedness, and growth needs, providing a more adaptable understanding of human needs. The framework proposed by McClelland emphasizes the importance of success, connection, and authority as key elements in comprehending motivation. This analysis highlights the real-world consequences of these concepts in work environments, especially in boosting job contentment and efficiency. These concepts are crucial for comprehending employee motivation, indicating a subtle method that harmonizes external and internal incentives. Significantly, the emphasis has frequently been on pinpointing and classifying the requirements that influence behavior, thereby shaping the managerial approaches to inspire employees.

Concurrently, Said Elbanna's exploration in a previous research of strategic decision-making (SDM) literature covers a range of frameworks and viewpoints [2]. The conversation mainly focuses on the contrast between the concepts of synoptic formalism and political incrementalism. Synoptic formalism broadens the scope of the rational model, focusing on comprehensive analysis and organized decision-making procedures. Conversely, political incrementalism, particularly the idea of intuitive synthesis, acknowledges the intricate and frequently political aspects of organizational decision-making, understanding that decisions often stem from gradual alterations rather than thorough planning. Investigations in theory within this field underscore the interaction of logical reasoning, instinct, and political conduct in influencing strategic choices. Frequently, this collection of research focuses on scholars and professionals keen on comprehending the intricacies of decision-making procedures and their impact on organizational results. According to Elbanna's analysis, successful strategic choices probably stem from a mix of logical and instinctive methods, shaped by the political backdrop of their occurrence.

In the field of organizational studies, two key research areas—theories of motivation and strategic decision-making—are vital, offering valuable perspectives for enhancing both human and organizational efficiency [2]. The first focuses on internal drivers and mental requirements, whereas the second delves into the procedural and situational elements involved in strategic decision-making. The merging of these domains provides a comprehensive perspective on organizational conduct, emphasizing the significance of psychological and procedural factors in attaining organizational triumph. Previous research discussed theories of motivation employ pivotal models such as, Maslow's Needs Hierarchy, Herzberg's Theory of Motivation-Hygiene, Alderfer's ERG Theory, and McClelland's Theory of Need for Achievement, concentrating on various elements influencing human actions and drive in work environments. In the realm of strategic decision-making, the investigator delves into the disparity between broad-based formalism and gradual political changes, underscoring the impact of logical reasoning, instinctive integration, and political interplay on organizational decision-making. A significant void exists in incorporating neuroscience viewpoints into decision-making research, especially in understanding the neural underpinnings of intricate decision-making processes. The disparity also applies to the link between motivation and decision-making processes, with the interaction between neural networks associated with motivation and decision-making still not thoroughly investigated. Although it's established that motivational states greatly affect decision-

DOI: 10.54254/2753-7064/40/20242333

making processes, the precise neural pathways and neurotransmitter systems responsible for this effect remain unclear. As an example, the functions of dopaminergic pathways, vital for reward processing and motivation, in influencing decision-making approaches and results remain largely unclear.

Furthermore, studies have frequently neglected the interaction between motivational state variations, influenced by individual variances in neural responsiveness to rewards or punishments, and the decision-making mechanisms. This encompasses comprehending the ways in which brain areas such as the prefrontal cortex, which plays a role in executive functions, and the amygdala, linked to emotional processing, influence decision-making in varied motivational scenarios. Insufficient investigation into the neural connections and their interplay with motivational elements hinders grasp of the interplay between biological and psychological factors in shaping decision-making processes, leading to individual differences in these behaviors.

2. Reward, Uncertainty, and Decision Making

2.1. The Impact of External Motivation on Decision Making

The collective examination of these studies offers a robust and nuanced understanding of how external motivation(simulations from external environment)influences decision-making, particularly in contexts characterized by uncertainty, risk, and varying reward structures. The integration of findings across different populations—ranging from individuals with psychiatric disorders to healthy subjects and prospective managers—highlights the pervasive role of motivation in shaping both behavior and neural activity. By delving deeper into the methodologies and outcomes of each study, ways in which external motivation intersects with cognitive processes can be appreciated ,then ultimately driving decision-making strategies that vary widely depending on the context and individual differences.

A study from Matsui et al provides a critical exploration of how external motivation, particularly the anticipation of rewards, affects decision-making in individuals with psychiatric conditions such as schizophrenia. The study employed tasks like the Delay Discounting Task (DP-task) and the Effort Expenditure for Reward Task (EEfRT), combined with functional Magnetic Resonance Imaging (fMRI), to offer a comprehensive understanding of how these factors interplay in complex decision-making scenarios [3]. The findings revealed that an increase in brain activity within the frontal and parietal regions is consistent with heightened anticipation of rewards, aligning with prior research linking these areas to reward processing. Notably, the study found no significant activity in the Orbitofrontal Cortex (OFC), suggesting that its design focused more on "decision-making strategies rather than the subjective value of rewards." This highlights the importance of motivation in driving cognitive strategies, particularly in clinical populations where decision-making may be impaired. The implications of these findings are profound, suggesting that enhanced motivation could improve decision-making abilities in individuals with psychiatric disorders.

Giustiniani et al. conducted a study that further explored this theme by examining the role of motivation in decision-making under uncertainty among healthy individuals [4]. By employing well-established tasks such as the Iowa Gambling Task (IGT) and the Effort Expenditure for Reward Task (EEfRT), the study provides a comprehensive look at how motivation influences behavior and neural responses in scenarios that involve risk and potential rewards. The study's key finding—that there were no significant behavioral differences in the performance of the EEfRT among participants who used different strategies on the IGT, yet a significant inverse relationship was observed between the ability to develop an optimal strategy in the IGT and the difficulty in making choices in the EEfRT —highlights the complexity of motivation's role in decision-making. The neuroimaging data showed that an increased focus on immediate outcomes, rather than motivation, was associated with the

DOI: 10.54254/2753-7064/40/20242333

adoption of inefficient decision-making strategies in the IGT, suggesting that while motivation is critical, its effects can be context-dependent and interact with other cognitive factors like immediate reward focus.

Ji et al. offers a different perspective by examining how external motivation influences exploratory decision-making in prospective managers, a group tasked with high-stakes decisions that often involve balancing risk and reward. The study focused on how the Behavioral Activation System (BAS) and Behavioral Inhibition System (BIS) influence the neural processes underlying exploratory decision-making in managerial roles [5]. Utilizing the "four-armed bandit" task and fMRI, the research revealed that higher BAS scores were associated with more exploratory choices, potentially indicating a preference for high-risk, high-reward options, particularly in low-performance groups. In contrast, the high-performance group exhibited greater activation in brain regions associated with reward processing and risk avoidance, such as the anterior insula and the supplementary motor area (SMA). The study further noted an inverse relationship between BAS scores and the activity of reward-related neural networks during exploratory decision-making in the low-performance group, suggesting that individuals with lower BAS scores may adopt a more calculated approach to exploration. This indicates that motivation, as quantified by BAS/BIS scores, significantly influences decision-making, with higher sensitivity to reward leading to more exploratory and potentially less calculated decisions.

Another study is done in 2023 by Liu et al. complements these findings by examining the neural underpinnings of value-based decision-making, focusing on how reward probabilities and timing influence cognitive processes. Participants engaged in tasks that varied in predictability and timing of potential rewards, with fMRI monitoring brain activity to assess the separate effects of reward probability and delay on decision-making behaviors and patterns of brain activation [6]. The study found that increased neural activity in the frontal and parietal lobes was associated with the anticipation of high rewards, and that manipulating probability specifically engaged the prefrontal cortex and the superior parietal cortex, regions linked to strategy adjustment and complex cognitive tasks. The absence of significant Orbitofrontal Cortex (OFC) activity reinforced the idea that the observed brain activations were more related to strategic decision-making processes than to the evaluation of subjective value. This suggests that when the probability and timing of rewards are uncertain, the brain may prioritize strategic planning over subjective valuation of outcomes.

When these studies are synthesized, they collectively provide a rich and detailed understanding of the role of external motivation in decision-making. Across different populations and contexts, motivation emerges as a central factor that not only influences behavior but also drives the underlying neural processes that shape decision-making strategies. Whether dealing with psychiatric conditions, exploring decision-making under uncertainty, or managing high-stakes decisions, the studies highlight that motivation influences not just behavior but also the cognitive and neural mechanisms underlying decision-making. Motivation is deeply intertwined with cognitive strategies, risk assessment, and reward processing, and its impact on decision-making can vary widely depending on the context and the individual.

This comprehensive understanding of motivation's role in decision-making has significant implications for a range of fields, from clinical psychology to management and beyond. It suggests that interventions aimed at improving decision-making must consider the complex interplay between motivation and other cognitive factors, tailoring strategies to the specific needs and contexts of the individuals involved. By enhancing motivation and aligning it with effective cognitive strategies, it may be possible to improve decision-making outcomes across a variety of settings, ultimately leading to better individual and societal outcomes. The synthesis of these studies thus provides a roadmap for future research and practical applications, emphasizing the need to view motivation as a dynamic and multifaceted force that plays a crucial role in the decision-making process.

DOI: 10.54254/2753-7064/40/20242333

2.2. The Role of Internal Motivation

In another study, the exploration of internal motivation (the stimulation inspire by one's voluntary) 's role in decision-making is illuminated by the examination of insight's impact on high-risk choices and the associated neurological activity [7]. The research investigates the behavioral and neural responses to insight, particularly focusing on the stimulation of the nucleus accumbens (NAcc) during high-risk decision processes. The methodology combines a web-based experiment with a visual Mooney recognition task to assess insight's behavioral impacts and an fMRI analysis to evaluate NAcc activity in response to the same task.

The behavioral findings reveal that participants were more inclined to choose riskier financial rewards following heightened AHA! Experiences(sudden enlightenment of a thing), indicating that the experience of insight can escalate risk-taking behavior. Concurrently, the fMRI research shows increased activity in the NAcc during periods of high AHA! instances compared to minimal ones. This heightened activity in a region integral to reward processing suggests that gaining insight may stimulate dopaminergic signaling, thereby influencing the likelihood of making risky decisions.

The value of this study lies in its ability to connect the cognitive experience of insight with its neural underpinnings, offering a neurobiological explanation for the influence of insight on decision-making. By demonstrating that insight is linked to the activation of the NAcc, a key region in the brain's reward system, the study provides evidence for why insights might lead to riskier choices.

In synthesizing the insights from this study with broader research on motivation and decision-making, it becomes clear that both internal and external factors play a crucial role in shaping people's choices under uncertainty. The experience of insight, as shown in this study, can significantly influence an individual's propensity for risk, while other studies have highlighted the impact of external motivation, reward anticipation, and immediate outcomes on decision-making strategies. Collectively, these findings underscore the importance of understanding the complex interplay between cognitive, emotional, and neurological factors in decision-making processes. This comprehensive understanding can inform the development of strategies to enhance decision-making in various contexts, from personal financial decisions to managerial roles and clinical interventions.

3. Relevant Factors and Implications

Synthesizes the three pivotal studies which each offer insights into the neurocognitive and cultural factors that shape decision-making processes. These studies, while distinct in their focus—ranging from the cultural influences on economic decision-making to the neurocognitive challenges faced by individuals with attention deficit hyperactivity disorder (ADHD)—collectively contribute to a broader understanding of how various factors intertwine to influence human behavior in uncertain and complex scenarios. By weaving together, the key insights from these studies, it can discern a comprehensive narrative that underscores the multifaceted nature of decision-making and the implications for both individual and societal contexts.

Chen and colleagues in their study delves into the cultural dimensions of economic decision-making, highlighting the neurocognitive differences between East Asians and European Americans [8]. Utilizing a high-risk gambling task in conjunction with electroencephalography (EEG) to monitor brain activity, the study provides a nuanced exploration of how cultural context influences economic behaviors. The focus on event-related potentials (ERPs), specifically P2 and P3 components, reveals the underlying emotional responses and attentional processes that differ between these cultural groups. The study finds that Americans exhibit a pronounced tendency to minimize losses, a behavioral inclination that is less prominent among East Asians. This cultural divergence is not merely an incidental finding but a critical element that shapes decision-making processes. It suggests that economic behavior cannot be fully understood without considering the cultural backdrop against

DOI: 10.54254/2753-7064/40/20242333

which these decisions are made. The implications are profound: policies and interventions aimed at influencing economic behavior must be culturally informed, recognizing that what works in one cultural context may not necessarily translate to another. This study emphasizes that cultural context is an active agent in shaping decision-making, challenging the notion that economic behavior is universal or culturally neutral.

There is also a previousstudy shifts the focus from cultural influences to the neurocognitive processes associated with ADHD done by Aster, particularly in the realm of flexible reward learning [9]. Through a probabilistic reversal learning experiment coupled with functional magnetic resonance imaging (fMRI) and reinforcement learning (RL) models, the study examines how individuals with ADHD navigate changing reward environments. The findings point to impaired flexible reward learning in ADHD patients, particularly before reward reversals, which is attributed to noisy decision-making processes. The study further identifies specific brain regions, such as the left posterior parietal cortex and the left ventral striatum, that are implicated in these impairments. These neural correlates provide a deeper understanding of the cognitive challenges faced by individuals with ADHD, offering potential pathways for targeted interventions. The implications extend beyond the individual, as understanding these neurocognitive deficits can inform the development of educational strategies and support systems that better cater to the needs of individuals with ADHD. This study underscores the importance of a nuanced approach to ADHD, recognizing that the disorder's impact on decision-making is both complex and multifaceted, with specific neural signatures that can guide intervention efforts.

Previous research continued the exploration of ADHD's impact on decision-making but with a deeper focus on the neurological underpinnings of reward acquisition [10]. Using a similar probabilistic reversal learning approach, this study delves into the reinforcement learning techniques that shed light on the brain's adaptability in ADHD patients. The findings reveal that ADHD patients exhibit poorer outcomes, particularly before reversals, which are linked to an overabundance in decision-making. This "noisy" decision-making process is further complicated by the neurological correlates identified in the study, specifically the left posterior parietal cortex and the left ventral striatum. These findings suggest that ADHD is characterized not just by impaired decision-making but by a heightened sensitivity to reinforcement and an accelerated learning pace for negative feedback. The study's implications are significant, as they highlight the complex interplay between cognitive processes and neurological factors in ADHD, suggesting that interventions must address both aspects to be effective. Moreover, the study points to the role of dopaminergic neuromodulation in ADHD, offering potential avenues for pharmacological interventions that could mitigate the decision-making challenges faced by individuals with ADHD.

Taking all the studies tougher, a cohesive narrative emerges that emphasizes the complexity of decision-making as a process influenced by cultural, cognitive, and neurological factors. The cultural nuances explored in Chen’s study remind that people’s backgrounds shape their economic choices, challenging the assumption that decision-making strategies are universally applicable [8]. This cultural sensitivity is crucial for developing economic policies that are effective across different cultural contexts. Studies, while focusing on ADHD, paint a broader picture of the challenges and potential of the human brain when faced with the need to adapt and learn from a constantly shifting landscape of rewards. The findings from these studies suggest that decision-making is not a solitary act but rather a confluence of influences that must be understood in their entirety to craft effective interventions and support systems.

4. Conclusion

The synthesis of research on motivation and decision-making reveals the intricate and multifaceted nature of these processes, highlighting how external and internal motivators significantly influence

DOI: 10.54254/2753-7064/40/20242333

cognitive and neural mechanisms. Across various contexts—ranging from personal decision-making to organizational strategies and clinical applications—the interplay between motivation and decision-making processes is evident. Studies show that motivation, whether driven by reward anticipation, cultural influences, or neural pathways, not only shapes behavior but also deeply affects the strategic and cognitive frameworks that guide decision-making. Understanding these dynamics is crucial for developing effective interventions and strategies that can enhance decision-making outcomes, whether in management, healthcare, or personal contexts.

Despite the valuable insights gained from these studies, several limitations must be acknowledged. First, the research primarily focuses on specific populations, such as individuals with psychiatric conditions or prospective managers, which may limit the generalizability of the findings to broader or more diverse groups. Additionally, the studies often emphasize particular aspects of motivation, such as external rewards, without fully exploring the complexities of internal motivational states or the role of intrinsic motivation in decision-making. Future research should aim to address these gaps by incorporating a more diverse range of participants and investigating the neural and psychological mechanisms underlying different types of motivation. Furthermore, exploring the intersection between neuroscience and decision-making theories, particularly in understanding how neural networks and neurotransmitter systems influence decision-making processes, could provide deeper insights. This could lead to the development of more nuanced and effective decision-making frameworks that are better tailored to individual differences and varied contexts.

References

[1] *Acquah, A., Nsiah, T.K., Antie, E.N.A. and Otoo, B. (2021). Literature review on theories of motivation. EPRA International Journal of Economic and Business Review, 9(5), 25-29.*

[2] *Elbanna, S. (2006). Strategic decision-making: Process perspectives. International Journal of Management reviews, 8(1), 1-20.*

[3] *Hattori, Y., Tsumura, K., Aoki, R., Takeda, M., Nakahara, K. and Jimura, K. (2022). Executive control by fronto-parietal activity explains counterintuitive decision behavior in complex value-based decision-making. NeuroImage, 249, 118892.*

[4] *Giustiniani, J., Nicolier, M., Teti Mayer, J., Chabin, T., Masse, C., Galmès, N., Pazart, L., Trojak, B., Bennabi, D., Vandel, P., Haffen, E. and Gabriel, D. (2020). Behavioral and Neural Arguments of Motivational Influence on Decision Making During Uncertainty. Frontiers in Neuroscience, 14, 583.*

[5] *Ji, J.L., Geiles, D. and Saulsman, L.M. (2021). Mental imagery-based episodic simulation amplifies motivation and behavioural engagement in planned reward activities. Behaviour Research and Therapy, 145, 103947.*

[6] *Liu, T., Vickers, B.D., Seidler, R.D. and Preston, S.D. (2023). Neural correlates of overvaluation and the effort to save possessions in a novel decision task: An exploratory fMRI study. Frontiers in Psychology, 14, 1059051.*

[7] *Becker, M. (2023). The influence of insight on risky decision making and nucleus accumbens activation. Scientific Reports.*

[8] *Chen, X.J., Ba, L. and Kwak, Y. (2020). Neurocognitive underpinnings of cross-cultural differences in risky decision making. Social Cognitive and Affective Neuroscience, 15(6), 671-680.*

[9] *Aster, H.C., Waltmann, M., Busch, A., Romanos, M., Gamer, M., Van Noort, B.M. and Deserno, L. (2024). Impaired flexible reward learning in ADHD patients is associated with blunted reinforcement sensitivity and neural signals in ventral striatum and parietal cortex. NeuroImage: Clinical, 42, 103588.*

[10] *Aster, H.C., Waltmann, M., Busch, A., Romanos, M., Gamer, M., Van Noort, B.M., Beck, A., Kappel, V. and Deserno, L. (2023). Impaired flexible reward learning is associated with blunted reinforcement sensitivity and attenuated learning and choice signals in ventral striatum and parietal cortex of ADHD patients.*

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242314

The Impact of Meritocracy on Higher Education: A Perspective from College Admissions Policies in Mainland China

Siyu Du[1,a,*]

[1]*Sichuan Film and Television University, Chengdu, China*
a. dusy1998@126.com
**corresponding author*

Abstract: This study examines the impact of meritocracy on higher education in mainland China, focusing on university admission policies. Since the reform and opening-up period, China's economic and educational advancements have increasingly emphasized elitism, particularly in allocating university admission slots through mechanisms like the Gaokao. The analysis, conducted from historical and contemporary perspectives, reveals that while elitism has optimized the distribution of educational resources, it has also deepened social inequalities. Despite their intent to promote fairness, policies such as the provincial quota system and independent admissions have widened regional and urban-rural disparities in educational resources. Furthermore, government initiatives like targeted poverty alleviation and regional preferential policies have had limited success in addressing these disparities. The study concludes that while elitism has centralized high-quality educational resources, it has hindered upward social mobility, especially for students from rural and disadvantaged backgrounds, highlighting the need for comprehensive reforms to achieve educational equity and social justice.

Keywords: Meritocracy, Higher Education, Admission Policies, Distributive Justice, Equal Opportunities.

1. Introduction

Since the establishment of the People's Republic of China, higher education in China has achieved significant milestones, particularly during the 40 years following the reform and opening up, which marked a critical period in the evolution of Chinese higher education [1]. The Gaokao (China's national college entrance examination), a uniquely Chinese educational examination system, serves as both a transition between high school and university and a conduit linking universities to broader society [2]. For individuals, the Gaokao plays a decisive role in determining access to higher education, which in turn significantly influences one's future career paths, income levels, and social status [3]. As meritocracy has intensified elitism within higher education, the emphasis on merit has promoted the expansion of higher education and the advancement of universities. However, rather than acting as catalysts for social mobility, elite research universities have instead deepened social inequality and diminished social mobility. [4]

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242314

This paper adopts both historical and contemporary perspectives to review the foundations of meritocracy, using the admissions policies of mainland Chinese universities as a case study to explore meritocracy's impact on higher education. To gain a deeper understanding of its effects, it is essential to reassess the concept of meritocracy. This paper will examine the implications of meritocracy through the lenses of distributive justice, equal opportunity, and social mobility. Given the focus on the admissions policies of mainland Chinese universities, an initial brief overview of these policies will be provided.

2. Admissions Policies of Mainland Chinese Universities

Since the Gaokao was reinstated in 1977, the admissions system of mainland Chinese universities has evolved through three major phases [5]. The first phase (1977-1998) employed a model where students were assessed based on total scores in either liberal arts or science subjects. The second phase (1999-2013) introduced the '3+X' admissions system ('3' refers to the three mandatory subjects: Chinese, Mathematics, and a foreign language, while 'X' represents the subjects from which students can choose one or more to take exams, such as Physics, Chemistry, Biology, Politics, History, and Geography.), giving students more choices. The third phase (2014-present) allows provinces to set their exam subjects based on local conditions, but overall admissions are still determined by total scores. [4][6]

Currently, mainland Chinese universities utilize five main admissions methods: the National Unified Examination for General Higher Education, where students are admitted based on their scores; Independent Admissions Examinations, which consider students' academic records and special talents; comprehensive evaluations that factor in Gaokao scores, high school academic performance, and overall student assessments; direct admission for students exempted from the Gaokao; and special programs targeting students from impoverished regions. [4][5][6]

Since the founding of the People's Republic of China, various forms of preferential admissions policies have been in place, targeting specific groups and circumstances. These include both merit-based preferences, such as those for students with exceptional talents in arts or sports and winners of academic competitions, and compensatory preferences, such as those under special programs aimed at promoting educational equity [7]. Over time, compensatory preferences have become predominant, reflecting the government's commitment to fairness in education. Admissions are influenced by both the allocation of higher education opportunities and the matching of student abilities. The initial allocation is shaped by the university's admissions capacity and provincial quotas, while secondary matching occurs based on students' scores and university requirements [8]. This dual process guides the government's intervention through two primary approaches: macro-level regulation aimed at achieving equitable educational opportunities across different groups, and micro-level score adjustments to enhance individual admission outcomes. Together, these measures create a complex and unique system of preferential admissions policies in mainland China.

In the following sections, this paper will examine the impact of meritocracy on higher education from the perspective of mainland Chinese university admissions policies, offering detailed analysis across multiple dimensions.

3. Definition of Meritocracy

The term 'meritocracy' was first coined in 1958 by British sociologist Michael Young in his work *The Rise of Meritocracy* [9]. Young [10] argued that under a meritocratic governance system, elites might become arrogant rulers, losing empathy and goodwill toward the public. In contrast, Bell, in *The Coming of Post-Industrial Society*, supported the concept of meritocracy, noting that in a post-industrial society, governance will be by those with technical skills and educational qualifications,

DOI: 10.54254/2753-7064/40/20242314

with status and income reflecting these attributes [11]. Broadly speaking, meritocracy dismantles the inherited privileges of the traditional aristocracy and fosters a belief in striving for excellence. Within a meritocratic system, rigorous training and bureaucratic rationality supplant social or familial background, democratic accountability replaces feudal autocracy, and human capital takes precedence over land. [4]

Meritocracy is defined as a system where political and economic resources are distributed based on individual ability and effort [4]. However, what precisely constitutes merit? In contemporary society, educational credentials are often used as indicators of talent [12], but Sandel [13] contends that academic qualifications are largely disconnected from practical wisdom or an instinct for the public good. Meritocracy also tends to rely on market mechanisms to define 'merit', yet Sandel [13] similarly argues that market value should not be the benchmark for contributions to the public good. Despite the absence of a precise definition, merit is generally associated with attributes such as talent, skills, intelligence, ability, and effort, and it is deemed just to reward individuals based on 'talent' and 'desert'. [4]

Since the 1960s, scholars like Michael Young, Daniel Bell, Michael Sandel, Daniel Markovits, and Jianhua Wang have extensively discussed meritocracy and its relationship with higher education. In the context of higher education, colleges and universities face challenges in selecting top candidates and defining what constitutes merit. Ji [14] highlights that university admissions in mainland China still largely rely on a single examination score, a practice rooted in the ancient imperial examination system. According to Gardner's theory of multiple intelligences, individuals possess eight distinct types of intelligence. However, the college entrance examination primarily evaluates linguistic and logical-mathematical intelligence, while other forms of intelligence receive relatively less attention [15]. Since the Ministry of Education's 2003 directive, some universities in mainland China have introduced independent admissions, marking a shift towards a more diversified talent selection model with varied criteria for excellence. For example, Zhang [16] notes that independent admissions mechanisms not only consider academic performance but also evaluate factors such as the learning process, character, and emotional intelligence, emphasizing the importance of comprehensive qualities and abilities. Consequently, how evaluators define and assess student achievement can significantly influence the composition of the student body.

Disagreements among scholars regarding the criteria for evaluating merit have complicated the formulation of university admissions standards. The evolving admissions policies in mainland China reflect the increasing complexity of the evaluation process, especially in terms of student diversity [4]. A central point of debate is the consideration of provincial quotas in the admissions process. The provincial quota admissions policy allocates a set number of university slots to different provinces based on specific criteria, aiming to address disparities in admissions caused by variations in educational attainment or exam performance [7][17]. Since its implementation in 1952, there has been a significant increase in the proportion of students from remote and underdeveloped regions, particularly in ethnic minority autonomous regions, who gain access to higher education [7]. This reflects a long-standing commitment to student diversity, supported by research highlighting its importance. The policy of admitting ethnic minority candidates to the college entrance examination was later enshrined in the Regulations on *the Implementation of the Law of the People's Republic of China on Regional Ethnic Autonomy* by the State Council, ensuring legal guarantees, stability, and continuity. The proportion of ethnic minority students in universities rose from 0.93% in 1950 to 5.7% in 2000 [18]. As the case of the provincial quota admissions policy in mainland China illustrates, merit is not, and cannot be a static concept. It requires deliberate reflection and must evolve in response to contemporary challenges.

DOI: 10.54254/2753-7064/40/20242314

4. Distributive Justice

The second aspect to consider involves the principle of merit-based rewards. This concept dates back to the ancient Greek philosopher Aristotle, who categorized justice into distributive, corrective, and retributive forms [19]. According to Aristotle, distributive justice concerns the fair allocation of valuable resources, such as wealth, honor, and rights [20]. In this framework, justice is achieved by treating individuals differently based on their merits and consistently treating similar cases. The meritocratic perspective on distributive justice asserts that scarce economic goods (like jobs, income, and wealth) should be allocated according to merit [21]. In other words, when these resources are distributed, individuals with higher merit should be prioritized over those with lower merit. The goods in question can range widely but are commonly encountered, including access to universities or elite schools, funding for schools, opportunities for advanced courses, and various rewards. Wang [4] used the term 'institutional goods' to refer to items most likely distributed by educational institutions, rather than more intrinsic educational benefits like knowledge and skills development. In education, applying a merit-based approach to allocate educational opportunities can incentivize students to engage more deeply and benefit fully [4]. This approach also ensures that extra educational opportunities and resources are allocated to those best positioned to make the most of them. It is anticipated that, over time, this method of distribution will prove to be the most effective and will maximize overall benefit.

In China, the uneven development of economic and social conditions across regions has led to a disparity in the distribution of higher education resources, exacerbating regional inequalities. Before 1978, China's strategy of regionally balanced development helped to reduce the gap in higher education levels across regions. However, after 1978, the uneven economic development across regions disrupted this balance, making the disparities in higher education increasingly pronounced and continually widening the gap between regions. [7]

A notable tension exists between the principles of meritocracy and distributive justice in the higher education admissions policies of Mainland China. While meritocracy is intended to select the most qualified students through competitive processes, the uneven distribution of educational resources can exacerbate regional disparities [4]. Data from 2023 reveals that, in China, students from economically developed eastern regions are more likely to be admitted to prestigious universities, which undermines the principle of distributive justice [22]. For example, admission rates for undergraduate programs in economically advanced areas such as Beijing and Shanghai are significantly higher than those in the central and western regions. This disparity is even more pronounced for top-tier universities. For instance, the admission rates for the 211 project universities (116 key universities selected by the Chinese government) in Beijing and Shanghai are 22% and 14%, respectively, while the rates for the 985 project universities (39 top universities selected by the Chinese government from the 211 Project universities) are 7.1% and 5.3%, far exceeding those in central and western regions. [22]

To address this inequality, the Chinese government has implemented regional preferential admissions policies, established targeted enrollment programs, and offered additional admission quotas to students from economically disadvantaged areas through the Poverty Alleviation Special Plan [7]. Over the past decade, this initiative has significantly increased the proportion of rural students gaining admission to prestigious universities [23]. However, Du [24] claimed that the program benefits only a small segment of students from a few top-tier schools and has not substantially improved the overall educational levels of rural students or reduced the educational disparity between rural and urban areas. Moreover, the program has, to some extent, contributed to the rise of 'elite schools', which has disrupted the regional education system and intensified disparities in resource distribution. [4]

DOI: 10.54254/2753-7064/40/20242314

Long-term educational equity requires addressing the fundamental issue of uneven resource distribution. This involves not only increasing investment in education in the central and western regions but also improving the quality of basic education, upgrading school infrastructure, offering more teacher training opportunities, and ensuring that high-quality educational resources are directed to underdeveloped areas. Additionally, admissions policies should aim for greater regional balance by employing flexible and diverse criteria to ensure equitable opportunities for students from all regions.

5. Equal Opportunity

Equality of opportunity is a fundamental requirement of a performance-based allocation system, meaning that individuals with equal talents should have equal chances in resource distribution. Rawls [25] asserts that equality of opportunity is achieved when people with similar endowments and aspirations have equal prospects for success in competition. Gordon [26] similarly states that positions should be open to all, and under such conditions, individuals with similar abilities have equal chances for public office. In mainland China, university admissions policies strive to ensure equality of opportunity through transparent and fair selection procedures. These include standardized exams, clear admission criteria, and special policies for disadvantaged groups. Yang [23] contends that educational equality of opportunity does not mean identical education for everyone, but rather that the state provides education suited to each person's abilities and needs most equitably.

Mainland China's undergraduate admissions policies are designed to promote equality of opportunity. Since the reinstatement of the college entrance examination, China has replaced the recommendation system with a unified national exam and standardized admission criteria, establishing a fair competition model centered on exam performance and student ability [7]. This approach embodies the principle of equality of opportunity, aiming for 'equality before scores' [8]. The reform has removed educational discrimination based on background, ensuring that all individuals can access higher education based on their abilities. [4][7][27]

However, the principle of merit-based equality has evolved into a score-centered value system, leading to issues related to 'score-based meritocracy' [27]. To address these issues, China has implemented a bonus points policy in the college entrance examination to offset the shortcomings of a purely score-based system [28]. In addition to preferential policies for ethnic minority students, children of overseas Chinese, veterans, and martyrs' children, there are bonus points for high-achieving students in academics, arts, and sports [7]. For instance, the 1986 National Education Commission regulations allowed students with a national second-level athlete title to receive a 20-point reduction in their admission score. The 1987 *Interim Regulations for the Admission of Ordinary Higher Education* detailed the eligible items and bonus points. However, intense competition has revealed flaws in the bonus points policy, such as poor design and insufficient supervision. [4]

In response, in 2010, the Ministry of Education and other departments issued *the Notice on Adjusting Some College Entrance Examination Bonus Projects* and Further Strengthening Management, which mandated local adjustments to bonus points for academic and sports achievements [4]. Since 2018, China has eliminated national college entrance examination bonus points for sports specialties, middle school academic Olympiads, science and technology competitions, provincial-level outstanding students, and notable achievements in ideological and political morality, to enhance equality of opportunity and ensure fairness, justice, and orderliness in higher education admissions. [29]

DOI: 10.54254/2753-7064/40/20242314

6. Social Mobility

A final critical aspect of meritocracy is how higher education serves as a mechanism to provide equal opportunities for social mobility. Since the 19th century, driven by the values of merit and virtue, higher education has rapidly expanded, establishing an elite educational system [4]. In contrast to past reliance on factors such as bloodline, social status, race, gender, and family background, today, 'ability' and 'effort' have become the fundamental principles guiding social mobility and stratification [30]. Higher education not only plays a key role in producing qualified members of society but also acts as a significant force in promoting individual upward mobility [31]. Bourdieu [32] noted that in the fluid world of status culture, an individual's stock of cultural capital is only partially determined by their childhood experiences and family background. This suggests that for students from lower social strata, narrowing the cultural gap with the upper class through higher education is the primary path to upward mobility. However, as education has become more widespread, the meritocratic principle—where educational attainment is the benchmark for social status—has gradually lost its autonomy in the competition for socioeconomic status, with wealth or family background increasingly overshadowing merit [4][8]. The meritocratic principles, initially intended to promote social mobility and the elite higher education system based on them, have not only failed to facilitate upward mobility for disadvantaged groups but have also exacerbated social inequality. [7]

The higher education admissions system was designed to maintain social stability, promote social mobility, and ensure social order [7]. However, significant discrepancies exist in practice. The independent admissions system is a prime example within higher education admissions, with its unique characteristics evident. Zhang [16] argued that regional differences in students admitted through independent admissions have concentrated top higher education resources in urban areas, where prestigious universities are located, disadvantaging rural students in this competition. Nationally, the proportion of rural students in universities has decreased from about 30% in the 1980s to only 17.7% in 2009 [33]. Wen's study [34] of over 2,800 undergraduates from various institutions in Jiangxi and Tianjin during the 2004-2005 academic years revealed that the proportion of rural students in key national universities and third-tier institutions was significantly lower, at 31.3% and 39.4%, respectively. Furthermore, research by Xun and Wang [27] from the Higher Education Research Center at Xiamen University found that the urban-to-rural household registration ratio among freshmen admitted through independent admissions in 2009 was 92.1% to 7.9%. Additionally, Bao [28] demonstrated through a multinomial logit regression analysis that rural students had a 52.4% lower probability of success in independent admissions compared to their urban counterparts. Similar conclusions were drawn by Wu and Li [35] using a multinomial logit model.

While the distribution of quality higher education resources is closely linked to the allocation of urban and rural basic education resources, it is also influenced by the higher education admissions examination system. Geographically, universities in mainland China authorized to conduct independent admissions are mainly concentrated in the economically developed eastern coastal provinces [29]. These universities show a clear regional bias in the allocation of independent admissions slots [7]. For example, in the 2009 and 2010 independent admissions exams in China, students from the economically developed Beijing-Tianjin-Shanghai region accounted for 37.2% and 34.7% of the national pre-admission numbers, respectively [22]. Moreover, the requirements set by independent admissions universities for high school sources disadvantage rural applicants. Research indicates that students from provincial capital cities are more likely to receive independent admission offers compared to those from economically underdeveloped rural areas [23]. Within the urban-rural dual structure, most rural junior high school students attend regular county or rural high schools, but

DOI: 10.54254/2753-7064/40/20242314

the majority of non-key high schools do not qualify to recommend students for independent admissions, further hindering social mobility. [17]

In examining the driving forces behind the development of higher education, it is crucial to deeply explore the impact of external factors such as politics and economics. The role of higher education in promoting social mobility is not without limitations; it is conditional and limited in scope [7]. Conditionality means that higher education's ability to promote social mobility depends on the support and cooperation of other social subsystems [36]. Without such support systems, higher education alone cannot effectively facilitate social mobility. Systemic disadvantages in social and economic terms can significantly impact individual achievement levels, making it unrealistic to solve educational inequality issues by focusing solely on education itself [37]. Limited scope refers to the fact that although access to higher education might ensure that everyone can receive education, and even equality of conditions at certain stages, the ultimate outcome is that higher education can only promote social mobility for a minority, and it cannot guarantee equal upward mobility for everyone [36]. Given the conditional and limited nature of higher education in promoting social mobility, relying solely on the development of higher education to achieve social equity and justice is impractical. Instead, achieving the goal of higher education promoting social mobility must be based on the premise of social equity and justice. [4]

Additionally, the trend of elitism in higher education has also impacted social mobility. As competition for prestigious schools intensifies, students who enter these institutions increasingly come from more privileged socioeconomic backgrounds [4]. This phenomenon, known as 'aristocratic education', refers to the gradual transformation of higher education into an exclusive domain for social elites, reducing the opportunities for children from ordinary families to enter prestigious schools, thereby hindering social mobility. [29]

To promote social mobility, the Chinese government has implemented various measures, such as educational poverty alleviation, regional preferential policies, and special admissions programs. For instance, the Ministry of Education of the People's Republic of China issued the *Opinions on Implementing a Pilot Reform of Basic Subject Enrollment in Some Universities*, which abolished independent admissions from 2020 onwards [4]. According to the Ministry of Education's Department of Higher Education Student Affairs, *the Strong Foundation Plan* differs from the previous independent admissions process by combining applicants' college entrance examination scores, comprehensive university assessments, and evaluations of their overall quality into a composite score, and admitting students based on rank order [29]. This approach, to some extent, safeguards social mobility. However, these measures' effectiveness remains limited. For example, Wang [7] notes that some low-income families forgo the exams because they cannot afford the costs of transportation and accommodation associated with the independent admissions process. Therefore, improving social mobility will require long-term efforts and systemic reforms.

7. Conclusion

This study examines the impact of meritocracy on higher education, specifically focusing on the admissions policies of mainland Chinese universities. Conducted in the context of China's rapid economic and educational development since the reform and opening up, the central question of this research is how meritocratic principles, as applied through the Gaokao and other university admissions mechanisms, influence distributive justice, equal opportunity, and social mobility within China's higher education system.

The analysis reveals that while meritocracy has significantly advanced educational access and institutional excellence, it has also exacerbated social inequalities and limited social mobility. Merit-based admissions, particularly those reliant on standardized tests like the Gaokao, often overlook disparities in regional educational resources and socioeconomic backgrounds. Consequently, students

DOI: 10.54254/2753-7064/40/20242314

from economically advantaged regions and families are more likely to secure places in top universities, while those from less privileged backgrounds remain at a disadvantage, perpetuating cycles of inequality.

The research further underscores the tension between meritocracy and distributive justice in Chinese higher education. Although meritocracy aims to allocate educational opportunities based on individual ability and effort, the uneven distribution of resources undermines this goal, leading to regional and socioeconomic disparities in admissions outcomes. While the Chinese government has implemented targeted policies, such as special admissions programs for disadvantaged groups, these measures have only partially addressed the educational gap.

Evaluating the overall impact of meritocracy on higher education in China reveals that the system's benefits are unevenly distributed. The emphasis on academic achievement as the primary criterion for university admission overlooks other crucial factors, such as diverse forms of intelligence and the broader social and economic contexts in which students live. This narrow definition of merit limits the higher education system's ability to function as a true engine of social mobility.

Future research should explore more inclusive and holistic models of merit that consider a broader range of student abilities and backgrounds. Additionally, further investigation is needed into the long-term effectiveness of government interventions aimed at promoting educational equity. By broadening the concept of 'merit' and addressing systemic issues that perpetuate inequality, higher education in China can better fulfill its role in promoting social justice and mobility.

References

[1] *Wu, G.X. & Du, S.J. (2018). The development of higher education in China over the past forty years of reform and opening up. Social Development Research, 17(2), 5-25.*

[2] *Eiras, P.R.S. (2020). Cultural identity of Chinese students in a transnational university in China (Doctoral dissertation, University of Surrey).*

[3] *Liu, Y. (2016). Higher education, meritocracy and inequality in China. Springer.*

[4] *Wang, J.H. (2022). Why Does Meritocracy Fail in Higher Education?. Journal of Nanjing Normal University (Education Science Edition) (04), 1-12. doi:10.19563/j.cnki.sdjk.2022.04.001.*

[5] *Zou, Y. (2018). Educational opportunity between meritocracy and equity: A review of the National College Entrance Examination in China since 1977. Testing and Inclusive Schooling, 34-46.*

[6] *Ji, Q.C. (2018). Examination and enrollment linkage: The value, dilemma and countermeasures of the reform of gaokao subjects. China Exam, (6), 10-15.*

[7] *Wang, H.X. (2008). Fairness Research of the College Entrance Examination Policy in China. Journal of Central China Normal University.*

[8] *Li, L., & Wu, Q.X. (2020). From Equal Rights, Equal Opportunities to Equal Development: An Analysis Based on China's Tilted Admission Policy. Educational Research, 41(3), 95-105.*

[9] *Allen, A. (2011). Michael Young's the rise of the meritocracy: A philosophical critique. British Journal of Educational Studies, 59(4), 367-382.*

[10] *Markovits, D. (2019). The meritocracy trap. Penguin UK.*

[11] *Bell, D. (2019). The coming of post-industrial society. In Social Stratification, Class, Race, and Gender in Sociological Perspective, Second Edition (pp. 805-817). Routledge.*

[12] *Feng, T. (2023). Eugenicism: value, critique and its correction. Exploration and Controversy (10), 93-102+178-179.*

[13] *Sandel, M.J. (2020). The Tyranny of Merit: What's Become of the Common Good?. Farrar, Straus and Giroux.*

[14] *Ji, Q.C. (2023). The Historical Rationale and Innovation Direction of China's College Enrollment System. Heilongjiang Higher Education Research (10), 41-45. doi:10.19903/j.cnki.cn23-1074/g.2023.10.002.*

[15] *Zhang, H.J. (2019). The dilemma of the "Scores-only" Enrollment: the Root of the Concept and System. China Exam (01), 10-14+39. doi:10.19360/j.cnki.11-3303/g4.2019.01.002.*

[16] *Zhang, Y.Q. (2010). The Independent Recruitment Reform in Higher Education Institutions: Motivation, Challenges, and Approaches. Peking University Education Review (02), 30-42+187-188. doi:10.19355/j.cnki.1671-9468.2010.02.004.*

[17] *Qing, X.L. & H, T.S. (2020). The University Enrollment Quotas System: Public Responsiveness and Media Moderating Influence in China. Jiangsu Higher Education, (1), 38-46.*

[18] Zhao, Y.L. (2007). A General Account of the Favorable Policy to the Minority Examinees in the Enrollment of College Entrance Examination and the Reality Analysis. Education and Examination (04), 35-39. doi:10.16391/j.cnki.jyks.2007.04.015.
[19] Hogan, R., & Emler, N.P. (1981). Retributive justice. In The justice motive in social behavior: Adapting to times of scarcity and change (pp. 125-143). Boston, MA: Springer US.
[20] Olsthoorn, J. (2013). Hobbes's account of distributive justice as equity. British Journal for the history of philosophy, 21(1), 13-33.
[21] Mulligan, T. (2018). Justice and the meritocratic state (p. 238). Taylor & Francis.
[22] Ministry of Education of the People's Republic of China. (2023). Available at: http://www.moe.gov.cn/ [Accessed on 24 August 2024].
[23] Yang, D.P. (2021). The Ideal and Reality of Educational Equity in China. BEIJING BOOK CO. INC.
[24] Du R.J. (2022). Motivations, Challenges, and Future Directions of "College Special" Enrollment Policies. Educational Economics Review (03), 23-45. doi:10.19512/j.cnki.issn2096-2088.2022.03.006.
[25] Rawls, J. (2001). Justice as fairness: A restatement. Harvard University Press.
[26] Gordon, E.W. (1999). Education and justice: A view from the back of the bus. Teachers College Press.
[27] Xun, Z.F. & Wang, Q.H. (2011). Independent enrollment: A Battle Field for Elite Student. Tsinghua University Education Research (02), 56-63. doi:10.14138/j.1001-4519.2011.02.012.
[28] Bao, W. (2012). An Empirical of Independent Admission Policy of Higher Education Institution: Based on the perspectives of fairness and efficiency. Educational Development Research (19), 1-7. doi:10.14121/j.cnki.1008-3855.2012.19.004.
[29] Yang, M.Y., Miao, T.X., Li, W, Y & Sun, B.C. (2023). An Impact Evaluation of Social Stratification for University Independent Enrollment in China. Shandong Higher Education (03), 33-41.
[30] Piff, P.K., Kraus, M.W., & Keltner, D. (2018). Unpacking the inequality paradox: The psychological roots of inequality and social class. In Advances in experimental social psychology (Vol. 57, pp. 53-124). Academic Press.
[31] Wu, J. (2012). Analysis of the Relationship between Higher Education and Social Mobility. Journal of South China Normal University (Social Science Edition), 4, 28-31.
[32] Bourdieu, P. (2018). Distinction a social critique of the judgement of taste. In Inequality (pp. 287-318). Routledge.
[33] Li, L. (2009). Why the proportion of rural college students is less than half. The Road to Success (03), 1.
[34] Wen, D.M. (2005). The impact of family background on higher education opportunities and graduate employment in China. Peking University Education Review (03), 58-63. doi:10.19355/j.cnki.1671-9468.2005.03.010.
[35] Wu, X.G & Li, Z.L. (2017). Independent Enrollment and Talent Selection in Chinese Higher Education. Social Science Digest (11), 65-67.
[36] Baraldi, C., & Corsi, G. (2017). Niklas Luhmann: Education as a social system (pp. 1-4). Cham: Springer.
[37] Meyer, K. (2014). Education, Justice and the Human Good. Routledge.

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242289

Academic Procrastination of High School Students as a Product of Low Self-Esteem: A Mediation Role of General Self-Efficacy

Jiaye Liu[1,a,*]

[1]*Hefei NO.6 High School, Luyang district, Hefei, China*
a. liu_jia_ye@126.com
**corresponding author*

Abstract: Academic procrastination is a common behavior among high school students. This study aims to evaluate the direct and indirect effects of self-esteem on academic procrastination among high school students based on their general self-efficacy. This study used the Rosenberg Self-Esteem Scale, General Self-Efficacy Scale, and Middle School Student Academic Procrastination Scale as the main measurement tools. 216 high school students in Hefei were selected as the research subjects, and descriptive statistics, reliability and validity analysis, correlation analysis, multiple linear regression analysis, and mediation effect analysis were conducted using SPSS 21.0. The following research conclusion is drawn: First, there is a significant positive correlation between self-esteem and general self-efficacy. Second, there is a significant negative correlation between self-esteem and academic procrastination. Third, general self-efficacy mediates the relationship between self-esteem and academic procrastination.

Keywords: Self-Esteem, General Self-Efficacy, Academic Procrastination, High School Student.

1. Introduction

The relationship among self esteem, common self-efficacy and learning delay was studied in this article. In order to verify this study, we have carried out a questionnaire, analyzed the description, analyzed the relation, evaluated the mediativity-effectiveness test with the help of SPSS 21.0 and Process plugin. In particular, higher self-esteem is associated with greater overall self-efficacy, resulting in a decrease in academic procrastination.

1.1. Self-esteem and General Self-Efficacy

Psychologist James was among the earliest to interpret self esteem, and he defined it with a formula called self esteem = success/ambition. This suggests that one's self esteem is the ratio of one's achievements to one's aspirations. This may cause a drop in self esteem when there is a material gap between what one actually achieves and what one wants. But if there is a strong connection, it will grow [1]. Similarly, Rosenberg defines self esteem as one's self assessment of oneself, which opens the way to measure self esteem. He later developed the SES (SES) [2], which has become an important instrument for assessing self esteem.

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242289

The second variable to be investigated in this paper is the common sense of self efficacy, which was coined by psychologist Bandura. It was defined as an individual's own evaluation or prediction of his or her capacity to adjust his behaviour and keep faith in himself when he meets problems around him [3]. Over the course of his studies, many scholars regard self-efficacy as a consistent feature of an individual's specific field of competence, called General Self-Efficacy (GSE)[4]. Schwarzer and Jerusalem's General Self Efficacy Scale (GSES) (GSES), widely adopted across several nations, is believed to reflect the self-confidence of an individual in his/her ability to cope with various challenges and challenges [5]. Wang used GSES as a tool to teach high-school pupils in China and achieved good results [6].

Farid suggested a strong connection between self-esteem and self-concept, stating they can be used interchangeably, and observed disparities in self-esteem based on gender among middle school students [7]. Zhang found notable variations in self-esteem levels among high school students of various sexes, noting a detrimental relationship between self-esteem, academic self-concept, and test anxiety [8].

Burk's study shows that GSE can promote self esteem but can lead to negative outcomes [9]. Frank's study found a link between high school students' positive self-esteem and overall self-efficacy [10]. In his research, Bonsaksen used self-esteem and common self-efficacy as a measure of health of psychology, stressing that boys who had a better total feeling of self esteem had more tendency to have a stronger feeling of self esteem [11].

1.2. Self-esteem and Academic Procrastination

Many instruments have been used to evaluate procrastination. For example, the General Procrastination Scale, the Student Procrastination Assessment Scale of Solomon and Rohrmann, and the Choi and Moran Scale. Despite this, Tuckman's Scale remains the most popular way to recognize academic procrastinators. McCloskey's study shows that the Academic Procrastination Scale (APS) could be used as a useful and reliable tool in learning[12].

In his study, Choi [13] emphasized that not all procrastination behaviour are harmful and can lead in unfavourable outcomes. He classified procrastination as passive and activated. Defined as a person who cannot complete a task on time because of his or her lack of resolution and negative feelings, a passive procrastinator is in contrast to an active procrastinator, whose characteristic is a positive type of procrastination. The study found that despite similar delays in both active and passive procrastinators, they were more likely to have a better grasp of time, self-efficacy, and academic achievement than non-procrastinators. This research suggests that procrastination has more than just negative consequences. Classifying procrastination as an adaptation delay, which is equivalent to passive procrastination, he does not regard it as an expression of active procrastination. Instead, he defines adaptive latency as proactive latency – a deliberate stalling strategy. Others have shown that those who are more likely to be more successful at learning [14]. Despite this, Ziegler notes that there is a negative correlation between secondary school pupils' academic performance and their learning delays, which suggests that procrastination impedes pupils' learning outcomes [15]. Nembhard and Kim's work has shown that procrastination in pupils is related to their academic performance, with women showing fewer delays and better grades than men [16].

Peixoto [17]found that academic achievement affects the self-esteem of lower grade students, but for higher grade students, their self-esteem level affects their academic achievement. A research by Sarı [18] indicated that self-esteem was negatively correlated with the anxiety from tests; the higher the self-esteem, the lower the test anxiety, and the lower likelihood of learning burnout. The phenomenon is seen by many as a result of the poor ability of the pupils to maintain or modify their self-esteem. Additionally, girls have higher levels of exam anxiety than boys.

DOI: 10.54254/2753-7064/40/20242289

1.3. General self-efficacy and academic procrastination

In Zhang [19], there is a strong connection between academic procrastination and overall self-efficacy in middle school students, with general self-efficacy serving as a predictor for their tendency to procrastinate academically. The study by Qian [20] suggests that high general self-efficacy can help students use active procrastination skills in the face of academic pressure and encourage them to take active action to improve their performance. Kandemir [21] determined in their study that academic self-efficacy has the ability to elucidate or impact academic procrastination across 11 dimensions.There is a general negative correlation between academic procrastination and an increase in self-efficacy, with a negative influence on the former.

Zhang's [22]study showed that self-regulation and self-efficacy are mediators in the relationship between self-esteem and academic procrastination. Jahangir & Batool's [23] study further implied that academic self-efficacy is a mediator of this connection, with 18% of academic procrastination variance being indirectly affected by self-esteem through academic self-effecacy.Despite the wealth of research done by researchers on the relationship between self-esteem, general self-efficacy, and academic procrastination, there is little evidence to investigate the relationship among the three factors. Therefore, this paper tries to investigate the relationship between the self-esteem of senior middle school students and the effect of common self-efficacy on learning delay.

2. Method

The Rosenberg Self-Esteem Scale assesses adolescent self-esteem using a combination of positive and negative statements across 10 items [24].The scale is unidimensional, with each question requiring a response on a 4-point Likert scale, where responses are scored as follows: “Strongly agree” = 4 points, “agree” = 3 points, “disagree” = 2 points, and “strongly disagree” = 1 point. Noteworthy is the fact that questions 6, 8, 11, 12, and 13 are reverse-scored, while questions 1, 2, 3, 4, 5, 7, 9, and 10 are scored in the positive direction.Scores ranging from 10 to 40 are the overall score, with higher scores signifying greater self-esteem. The dependability and efficacy of this scale have been thoroughly verified in literature studies [25,26].

The General Self-Efficacy Scale consists of ten items that measure a person's ability to cope with everyday problems and cope with stressful situations. Examples of this kind of self-efficacy are: "I can solve problems when I'm in trouble", "no barriers are out of my reach", "I have the ability to concentrate and achieve my goals", and "I'm calm when I'm in trouble." The scale uses a four-point scoring system, in which "strongly disagree" gets one point, "disagree" gets two points, "agree" gets three points, and "strongly agree" receiving 4 points. No reverse scoring is available, and the overall score is between 10 and 40. The high level of confidence, coherence and effectiveness of this measure has been confirmed by several scientific studies [27,28].

The Academic Procrastination Scale for Middle School Students (SAT)[29] has been developed to evaluate the propensity of middle-school students to postpone or evade their assignments, as demonstrated by phrases such as "if my teacher does not review my work, I will not be able to do it on time", "I put off decision-making till I had no other choice", "I always procrastinated about assignments or learning", "I had a reason to waste time just because I was too small," and "I had an excuse for not doing my assignments on time." This scale used a score of five marks, with "full agreement" given 5, "relative agreement" 4, "uncertain 3", "not too much consensus" 2 and "total disagreement" 1. The overall score is between 22 and 110.

DOI: 10.54254/2753-7064/40/20242289

2.1. Reliability and validity

Reliability, which is a measure of the reliability, stability and reliability of measuring devices (such as scales, questionnaires), shall be used in measuring procedures. In other words, Cronbach's alpha factor is generally used to measure the confidence of the measured data, which is what confidence means. Cronbach's alpha factor of 0.7 to 0.8 represents a satisfactory degree of confidence, whereas a score of 0.8 to 0.9 indicates a high degree of confidence; if it exceeds 0.9, then that would be regarded as excellent, as shown in the following chart.

Table 1: Reliability Test of the Scale.

Dimension	Number of items	Sample size	Cronbach alpha coefficient
Self-esteem	10	216	0.891
Self-efficacy	10	216	0.955
Academic procrastination	22	216	0.932

Two commonly used measures to evaluate the effectiveness of a survey are the Kaiser-Meyer-Olkin and Bartlett's sphericity. A higher KMO suggests a stronger correlation between the variables and is between 0 and 1. In addition, if the Bartlett sphericity test P is less than 0.05, the data is considered valid, as evidenced by a KMO of 0.947 (Table 3) for general self-efficacy, 0.908 for self-esteem (Table 2), and for academic procrastination 0.938 (Table 4). Bartlett's sphericity test also yielded a p-value of 0.000, which is below 0.05. To conclude, the survey is very valid.

Table 2: Validity Test of Self-Esteem Scale.

KMO and Bartlett's test		
KMO value		0.908
Bartlett’s sphericity test	Approximate chi square	1480.692
	df	45
	P-value	0.000

Table 3: Validity Test of General Self-Efficacy Scale.

KMO and Bartlett's test		
KMO value		0.947
Bartlett sphericity test	Approximate chi square	2070.276
	df	45
	P-value	0.000

Table 4: Validity Test of Academic Procrastination Scale.

KMO and Bartlett's test		
KMO value		0.938
Bartlett sphericity test	Approximate chi square	2738.829
	df	231
	P-value	0.000

DOI: 10.54254/2753-7064/40/20242289

Utilizing SPSS 21.0, descriptive statistics can be analyzed, reliability and validity can be assessed, correlation analysis can be conducted, multiple linear regression can be applied, and mediation effect analysis can be done through process analysis - all with a significance level of α=0.05.

2.2. Descriptive statistics

This study's sample size was 216 participants, with 103 male(47.69%)and 113 female(52.31%). The gender distribution indicates that girls are slightly more numerous than boys. Of the total sample, 67 were in their first year of high school, making up 31.02%.In the sample, 61 students are in their second year of high school, making up 28.24%. Of these, 88 are in their third year, which accounts for 40.74%. The highest proportion is in the third year, at 40.74%, followed by first and second year, with 31.02% and 28.24% respectively. See Table 5.

Table 5: Basic Information of Participants.

	Option	Frequency	Percentage (%)	Cumulative percentage (%)
Gender	Male	103	47.69	47.69
	Female	113	52.31	100.00
Grade	Grade 10	67	31.02	31.02
	Grade 11	61	28.24	59.26
	Grade 12	88	40.74	100.00

2.3. Correlation analysis

The study utilized the Pearson correlation coefficient to examine the connection between variables, revealing that self-esteem and general self-efficacy are highly correlated ($p<0.01$); specifically, a correlation coefficient of 0.765 indicates that increased self-esteem is associated with heightened general self-efficacy. A strong association was found between self-esteem and academic procrastination, indicated by a correlation coefficient of -0.718 and a significant negative correlation ($p<0.01$). This suggests that as self-esteem levels increase, academic procrastination decreases. Similarly, a significant negative correlation ($p<0.01$) was observed between general self-efficacy and academic procrastination, with a correlation coefficient of -0.744. This implies that higher levels of general self-efficacy lead to lower levels of academic procrastination. See Table 6.

Table 6: Correlation analysis between Self-esteem, General Self-efficacy, and Academic Procrastination.

	Mean	Standard deviation (SD)	Self-esteem	Self efficacy	Academic procrastination
Self-esteem	3.395	0.571	1		
General self- efficacy	2.976	0.615	0.765**	1	
Academic procrastination	2.528	0.699	-0.718**	-0.744**	1

2.4. Linear Regression analysis

An analysis of linear regression was conducted to assess the influence of self-esteem on academic procrastination. The outcomes were as follows: $R^2=0.516$, indicating that 51.6% of the total variation

DOI: 10.54254/2753-7064/40/20242289

in academic procrastination can be attributed to self-esteem variables; F(1, 214)=228.265, p=0.000 **, thus demonstrating a significant overall effect from this study.A statistically significant effect of self-esteem on academic procrastination is indicated by the -0.718 standardized coefficient, which implies that for every unit rise in self-esteem, a 0.879 unit decrease in procrastination will be seen. Table 7 further confirms this result(p<0.01).

Table 7: Linear Regression Analysis Results of Self-Esteem and Academic Procrastination.

Linear regression analysis (*n*=216)							
	Non standardized coefficient		Standardization coefficient	*t*	*p*	Collinearity diagnosis	
	B	Standard Error	*Beta*			VIF	Tolerance
Constant	5.513	0.200	-	27.515	0.000**	-	-
Self-esteem	-0.879	0.058	-0.718	-15.108	0.000**	1.000	1.000
R^2	0.516						
Adjust R^2	0.514						
F	*F* (1,214)=228.265,*p*=0.000						
Note: Dependent variable=academic procrastination							
* *p*<0.05 ** *p*<0.01							

The effects of self-esteem on general self-efficacy were analyzed in this research using linear regression. The findings show that the self-esteem factor can account for 58.5% of the variance in general self-efficacy with an R-squared value of 0.585. The F-test results indicated that the regression model is statistically significant (F (1, 214)=301.395, p=0.000 **).In Table 8, it is evident that a one-unit increase in self-esteem results in a corresponding increase of 0.823 units in self-efficacy, as indicated by the regression coefficient of 0.823 and standardized regression coefficient of 0.765. This statistically significant impact of self-esteem on self-efficacy, demonstrated by the standardized coefficient of 0.765 (p<0.01), emphasizes the importance of self-esteem in predicting self-efficacy levels.

Table 8: Linear Regression Analysis Results of Self-Esteem and General Self-Efficacy.

Linear regression analysis (n=216)							
	Non standardized coefficient		Standardization coefficient	t	p	Collinearity diagnosis	
	B	Standard Error	Beta			VIF	Tolerance
Constant	0.180	0.163	-	1.104	0.271	-	-
Self-esteem	0.823	0.047	0.765	17.361	0.000**	1.000	1.000
R^2	0.585						
Adjust R^2	0.583						
F	F (1,214)=301.395,p=0.000						
Note: Dependent variable=self-efficacy							
* p<0.05 ** p<0.01							

DOI: 10.54254/2753-7064/40/20242289

This study investigated how self-esteem and general self-efficacy affect academic procrastination by using linear regression analysis. The results showed that when combined, self-esteem and self-efficacy accounted for 60.8% of the variance in academic procrastination. The F test produced a significant total score, with an F (2 213) of 165.001 and p = 0.000 * * (p < 0.01). A regression coefficient of 0.440 and a standard regression coefficient of -0.359 indicate that for each individual increase in self-esteem, academic procrastination will be reduced by 0.440 units; this is a model based prediction.The regression coefficient for general self-efficacy is -0.534, with a standardized coefficient of -0.470; this implies that for each unit rise in self-efficacy, academic procrastination will decrease by 0.534 units. Both had a statistically significant effect on academic procrastination (p < 0.01), as shown in Table 9.

Table 9: Linear regression results of Self-Esteem, General Self-Efficacy, and Academic Procrastination.

Linear regression analysis (n=216)							
	Non standardized coefficient		Standardization coefficient	t	p	Collinearity diagnosis	
	B	Standard Error	Beta			VIF	Tolerance
Constant	5.610	0.181	-	30.933	0.000**	-	-
Self-esteem	-0.440	0.082	-0.359	-5.394	0.000**	2.408	0.415
Self efficacy	-0.534	0.076	-0.470	-7.053	0.000**	2.408	0.415
R^2	0.608						
Adjust R^2	0.604						
F	F (2,213)=165.001,p=0.000						
Note: Dependent variable=academic procrastination							
* p<0.05 ** p<0.01							

2.5. Analysis of mediation effect

In my research, I examined the mediation effect with Process Macro, in which there is an intermediate variable M between the independent variable X and the dependent variable Y to determine whether X affects Y. The results are outlined below. A notable finding in this case is the significant negative correlation found between self-esteem and academic procrastination, as shown by the overall effect value of -0.8792. Essentially, this demonstrates that as self-esteem increases, the tendency towards academic procrastination decreases.. The 95% CI [-0.9938, -0.7645] not including zero makes this effect statistically significant. The negative value of the direct effect, which is the change from one thing to another, (-0.4395), suggests that, even in the context of general self-efficacy, self-esteem still has a notable negative impact on academic procrastination. The 95% CI [-0.6001, -0.2789] is statistically significant because it excludes zero. The indirect effect of one thing on another, with its negative value (-0.4397), suggests that self-esteem can reduce academic procrastination by enhancing general self-efficacy. Because the 95% CI [-0.599, -0.2726] does not contain zero, this result is statistically significant; see Table 10.

DOI: 10.54254/2753-7064/40/20242289

Table 10: Mediation effect test of General Self-efficacy on Self-esteem and Academic Procrastination.

	Effect	se	LLCI	ULCI
Total effect	-0.8792	0.0582	-0.9938	-0.7645
Direct effect	-0.4395	0.0815	-0.6001	-0.2789
Indirect effects	-0.4397	0.083	-0.599	-0.2726

3. Discussion

This research explores the relationship between self-esteem and academic procrastination, as highlighted in a literature review. Moreover, it examines how general self-efficacy mediates this relationship.

The results reveal a notable correlation between self-esteem and general self-efficacy (see Table 8). These findings are consistent with previous studies [30], which suggest that higher self-esteem strengthens and strengthens self-esteem, thereby helping to perform specific tasks, and vice versa. Furthermore, a strong inverse relationship has been observed between self-esteem and procrastination, as shown in table 7. The findings support earlier research that suggests that higher self-esteem can reduce academic fatigue and reduce the propensity to postpone learning.

The findings also suggest that general self-efficacy is a mediator between self-esteem and academic procrastination (see Table 10), suggesting that individuals with high self-esteem are more likely to exhibit high general self-efficacy, thus reducing academic procrastination. In contrast to Hen and Gorohit's [31] assertion that self-esteem is a mediator between general self-efficacy and trait procrastination, Hajloo's [32] findings are in agreement. However, recent research further supports the idea that people with low self-esteem are more likely to procrastinate[33]. Procrastination and avoidance are not just an excuse for bad performance and poor performance, thereby protecting self-esteem. Self-confidence has influence not only on academic procrastination but also on general self-efficacy, but also on academic procrastination.

4. Limitation and Suggestions

This study, as a first step, requires further validation in different populations. Furthermore, the present study has confined its research to two individual factors - self-esteem and general self-efficacy - in predicting academic procrastination. Current research suggests that other individual factors, including perfectionism and neuroticism [34], rational thinking, attention deficit, fear of failure, lack of time management skills, limited ability to solve problems, and working habits [35,36], have a significant impact on procrastination behaviour. In spite of the large number of participants, self-reported measurement techniques were used to rule out social expectations and common methods variance problems. Caution should be exercised when generalizing the results of this study because of its reliance on survey subjects from key classes. In addition, this paper uses cross-sectional research, which makes it difficult to establish a causal relationship. In order to better identify the reasons for academic procrastination, it is necessary to use longitudinal studies.

5. Implications

When students lack confidence in themselves, their overall effectiveness is reduced, resulting in delays in academic tasks. Regular procrastination can harm students' academic success, primarily seen through declining performance and further diminishing their self-worth.School teachers and leaders should pay greater heed to students' self-esteem, aiding them in forming it, and aiding them in resolving the issue of low self-esteem. Qualitative research assists educators in deliberately

DOI: 10.54254/2753-7064/40/20242289

recognizing the most critical elements that cause students to procrastinate academically, and then offering targeted interventions to address the issue. This vicious cycle will not cease.

6. Conclusion

This article explores the problem of Academic Procrastination. Two individual factors, self esteem and common self-efficacy, are selected from a variety of potential ones to analyze their impact on procrastination. This qualitative study is carried out in a horizontal manner. The subjects of the experiment are chosen from the Hefei Middle School, and a scale is published and data collected. Based on SPSS 21.0 and the Process plugin, it is clear that general self-efficacy acts as an intermediary between self-esteem and academic procrastination. In particular, high self-esteem tends to lead to higher general self-efficacy, thus lessening academic procrastination.

References

[1] *James, W. (1890). THE PRINCIPLES OF PSYCHOLOGY, VOL-2. MACMILLAN AND CO., LIMITED.*

[2] *Rosenberg, M. (1965). Rosenberg self-esteem scale (RSE). Acceptance and commitment therapy. Measures package, 61(52), 18.*

[3] *Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. Psychological review, 84(2), 191.*

[4] *Schwarzer, R., Bäßler, J., Kwiatek, P., Schröder, K., & Zhang, J. X. (1997). The assessment of optimistic self‐beliefs: comparison of the German, Spanish, and Chinese versions of the general self‐efficacy scale. Applied psychology, 46(1), 69-88.*

[5] *Schwarzer, R., & Jerusalem, M. (1995). Generalized self-efficacy scale. J. Weinman, S. Wright, & M. Johnston, Measures in health psychology: A user's portfolio. Causal and control beliefs, 35(37), 82-003.*

[6] *Wang Caikang, Hu Zhongfeng, Liu Yong.(2001). Reliability and validity of general self-efficacy scale. Applied Psychology (01),37-40.*

[7] *Farid, M. F., & Akhtar, M. (2013). Self-esteem of secondary school students in Pakistan. Middle-East Journal of Scientific Research, 14(10), 1325-1330.*

[8] *Zhang Chao & Qu Yuhong. (2010). The relationship between self-esteem, academic self-concept and test anxiety among high school students. Chinese Journal of Health Psychology(01),65-68.doi:10.13342/j.cnki.cjhp.2010.01.038.*

[9] *Lightsey Jr, O. R., Burke, M., Ervin, A., Henderson, D., & Yee, C. (2006). Generalized self-efficacy, self-esteem, and negative affect. Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement, 38(1), 72.*

[10] *Frank, G., Plunkett, S. W., & Otten, M. P. (2010). Perceived parenting, self-esteem, and general self-efficacy of Iranian American adolescents. Journal of Child and Family Studies, 19, 738-746.*

[11] *Bonsaksen, T. (2015). Predictors of general self-efficacy and self-esteem in occupational therapy students: A cross-sectional study. Occupational Therapy in Mental Health, 31(3), 298-310.*

[12] *McCloskey, J. D. (2011). Finally, my thesis on academic. The University of Texas at Arlington.*

[13] *Chun Chu, A. H., & Choi, J. N. (2005). Rethinking procrastination: Positive effects of" active" procrastination behavior on attitudes and performance. The Journal of social psychology, 145(3), 245-264.*

[14] *Corkin, D. M., Shirley, L. Y., & Lindt, S. F. (2011). Comparing active delay and procrastination from a self-regulated learning perspective. Learning and Individual Differences, 21(5), 602-606.*

[15] *Ziegler, N., & Opdenakker, M. C. (2018). The development of academic procrastination in first-year secondary education students: The link with metacognitive self-regulation, self-efficacy, and effort regulation. Learning and Individual Differences, 64, 71-82.*

[16] *Kim, J. E., & Nembhard, D. A. (2019). The impact of procrastination on engineering students' academic performance. International Journal of Engineering Education, 35(4), 1008.*

[17] *Alves-Martins, M., Peixoto, F., Gouveia-Pereira, M., Amaral, V., & Pedro, I. (2002). Self-esteem and academic achievement among adolescents. Educational psychology, 22(1), 51-62.*

[18] *Sarı, S. A., Bilek, G., & Çelik, E. (2018). Test anxiety and self-esteem in senior high school students: a cross-sectional study. Nordic journal of psychiatry, 72(2), 84-88.*

[19] *Zhang Y. (2012). Research on the relationship between academic procrastination, personality and general self-efficacy of junior Middle school students (Doctoral dissertation, Henan Normal University).*

[20] *Qian, L., & Fuqiang, Z. (2018). Academic stress, academic procrastination and academicperformance: A moderated dual-mediation model. Journal on Innovation and Sustainability RISUS, 9(2), 38-46.*

DOI: 10.54254/2753-7064/40/20242289

[21] Kandemir, M., İlhan, T., Özpolat, A. R., & Palanci, M. (2014). Analysis of academic self-efficacy, self-esteem and coping with stress skills predictive power on academic procrastination. Educational Research and Reviews, 9(5), 146.
[22] Zhang, Y., Dong, S., Fang, W., Chai, X., Mei, J., & Fan, X. (2018). Self-efficacy for self-regulation and fear of failure as mediators between self-esteem and academic procrastination among undergraduates in health professions. Advances in Health Sciences Education, 23, 817-830.
[23] Batool, S. S., Khursheed, S., & Jahangir, H. (2017). Academic procrastination as a product of low self-esteem: A mediational role of academic self-efficacy. Pakistan Journal of Psychological Research, 32(1), 195.
[24] Ciarrochi, J., & Bilich, L. (2006). Acceptance and commitment therapy. Measures package. Unpublished manuscript, University of Wollongong, Wollongong, Australia.
[25] Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, K. D. (2003). Does high self-esteem cause better performance, interpersonal success, happiness, or healthier lifestyles?. Psychological science in the public interest, 4(1), 1-44.
[26] Ciarrochi, J., Heaven, P. C., & Davies, F. (2007). The impact of hope, self-esteem, and attributional style on adolescents' school grades and emotional well-being: A longitudinal study. Journal of Research in Personality, 41(6), 1161-1178.
[27] Kraft, P., & Røysamb, E. (2000). Perceived self-efficacy in health behaviour research: Conceptualisation, measurement and correlates AU-Leganger. Anette Psychol Health, 15(1), 51-69.
[28] Schwarzer, R., Mueller, J., & Greenglass, E. (1999). Assessment of perceived general self-efficacy on the Internet: data collection in cyberspace. Anxiety, stress and coping, 12(2), 145-161.
[29] Ran H. (2010). Preliminary preparation of a questionnaire on middle school students' academic procrastination. Master thesis, Chongqing: Southwest University, P. R. China https://kns. cnki.net /KCMS/detail/ detail.aspx.
[30] Pahlavani, M., Nezhad, F. N., & Nezhad, N. N. (2015). Relationship between self-esteem with procrastination and self-efficacy among employers of professional and technical organization of Zahedan. Indian Journal of Fundamental and Applied Life Sciences, 5, 4882-4889.
[31] Hen, M., & Goroshit, M. (2014). Academic self-efficacy, emotional intelligence, GPA and academic procrastination in higher education. Eurasian Journal of Social Sciences, 2(1), 1-10.
[32] Hajloo, N. (2014). Relationships between self-efficacy, self-esteem and procrastination in undergraduate psychology students. Iranian journal of psychiatry and behavioral sciences, 8(3), 42.
[33] Flett, G. L., Blankstein, K. R., Hewitt, P. L., & Koledin, S. (1992). Components of perfectionism and procrastination in college students. Social Behavior and Personality: an international journal, 20(2), 85-94.
[34] Van Eerde, W. (2003). A meta-analytically derived nomological network of procrastination. Personality and individual differences, 35(6), 1401-1418.
[35] Dietz, F., Hofer, M., & Fries, S. (2007). Individual values, learning routines and academic procrastination. British Journal of Educational Psychology, 77(4), 893-906.
[36] Howell, A. J., & Watson, D. C. (2007). Procrastination: Associations with achievement goal orientation and learning strategies. Personality and Individual differences, 43(1), 167-178.

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242288

The Role of Political Institutions in the Economic Development of Different Countries: A Comparative Study Between the United Kingdom and China

Tianqi Xiong[1,a,*]

[1]*Department of Philosophy, University College London (UCL), London, United Kingdom, WC1E 6BT*
a. terryterry123@126.com
**corresponding author*

Abstract: Institutions hold a vital position in society as they significantly mold human behavior as well as determine the social outcomes of a nation. In the modern world, institutions can take on formal or informal kinds. Notably, the formal ones are governed by several norms and legislation. Such formal institutions often lead to significant outcomes within the development process of a country. This particular research places a concentrated focus on the role of different types of institutions in the process of development, highlighting the impacts that a wide array of institutions have on social and economic outcomes. The study takes into account a democratic institution along with a centrally controlled institution. Through the analysis, it could be found that the centrally controlled institutions that are portrayed by China have a greater level of efficiency, which leads to more optimal allocation of resources and swifter growth, thereby contributing significantly to the overall progress and prosperity of the nation.

Keywords: Political economy, institutionalism, authoritarianism, democratic development.

1. Introduction

Institutionalism is often deemed an approach that puts emphasis on the role of institutions, which are responsible for the shaping of economic and social outcomes. As Ansell puts forward, institutions are shaped by historical events where path dependency leads to the shaping of social and economic outcomes. Institutions learn from previous prospects and evolve accordingly with time [1]. This leads to institutions often being bound by certain norms and regulations that determine a fixed outcome for the economy and society. As a result, this shows that institutions often provide a framework that determines the occurrence of economic activities leading to the growth and development of a nation. Historically, institutions have been a critical part of economic development over the years. According to a study by Zergawu, it has been realized that there is a positive correlation between institutional quality and economic performance [2]. This is because the presence of a stable institution creates political stability and high governance. This leads to better property rights in the country and also reduces the cost of services in the country. As a result, transaction costs are much lower, and better property opportunities maximize investment and provide a higher return on investment. Thereby, the presence of strong institutions tends to lead to high levels of economic growth and development, even

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242288

at the national level. In an economic and political context, institutions can be segregated into several forms. Two of the most integral forms of institutions are formal and informal institutions [3]. Formal institutions are those that are constituted by laws and follow a regulated code of conduct. On the other hand, informal institutions are those that are not regulated and are mostly governed by human behavior. As a result, the formal and informal forms of institutions would have a varied impact on economic development in a particular country. This particular research would emphasize the formal form of institutions, as the study would analyze the impact that different kinds of formal institutions have on the development patterns across countries.

In a practical scenario, the formal form of institutions is often governed by certain norms and regulations. However, such formal types of institutions also vary across various countries. It has been determined that factors such as politics and governance form a significant part of institutions, which also vary across countries. As a result, the primary research question of the study is to analyze the impact that such different kinds of political and governance-based institutions have on the development process of a country. Based on the research questions, the study aims to analyze the role of political institutions and governance on economic development, providing a comparative analysis between two countries to show how different forms of institutions with respect to politics and governance impact development. Furthermore, it evaluates the influence of institutional quality on the socioeconomic outcomes of a particular nation. Additionally, this study seeks to understand the impact that institutions have on the present societal and economic outcomes of nations with different forms of institutions. This particular study helps to understand the impact that different forms of institutions can have on the development process of a nation. A particular institution shows a unique level of efficiency and allocation of resources, and having a deep understanding of various institutions and their impact on the development process would be critical for understanding the economy as well as formulating policies. As a result, this particular study on institutional forms and development is significantly important.

2. Literature Review

In economics, institutions are often referred to as norms that shape economic behavior and interactions. This leads to unique societal as well as economic outcomes for a particular state. Furthermore, in order to describe the theoretical framework, institutions could be divided into economic institutions, political institutions, and social institutions.

Economic institutions are the arrangements of the structures of the economy that lead to the economic operations of a nation. As per Baland, these institutions are a combination of formal and informal systems that regulate economic activities and institutions [4]. These economic institutions have a wide array of organizations under them, mainly markets as well as regulatory agencies. These institutions ensure that the transaction costs for economic transactions in a state are optimal and lead to greater efficiency. As a result, this reduces uncertainty in the economy and leads to economic growth and development. Political institutions are the structures that process and govern the ways power is exercised in a society. As per Wlezien and Soroka, political institutions are often considered mediators between public opinion and public policy [5]. This is because political institutions comprise the government structures as well as the electoral systems that determine how power is exercised and the entity that exercises the power. Furthermore, government bodies comprise judicial systems that consider the opinions of the public and incorporate them into policy for the betterment of society and the economy. This shows that political institutions are also major institutions that help in the development process of a state. These institutions are norms and practices that shape the social behavior and relationships of individuals in a society. In terms of economic development, social institutions could comprise several systems like education and healthcare [6]. This is because such systems as healthcare and education directly impact the societal well-being of the nation and also

DOI: 10.54254/2753-7064/40/20242288

indicate the human capital of the state. As a result, they are critical development parameters of a state, thus making social institutions an integral part of social institutions.

Property rights refer to the legal ownership of assets and resources in an economy. Furthermore, an economy that boasts stable property rights gives investors' confidence in the country, as they are confident that their investments will be protected and bailed out. According to the study of Malizia, enforcement of property rights is protected by public law institutions. This increases the confidence of investors to invest in the economy [7]. Additionally, the availability of property rights increases investment due to the availability of credit. A study by Delis found that the presence of strong property rights also enhances credit markets [8]. This is because investors' tangible assets are protected because of property rights. This makes such assets eligible to be used as credit facilities, thereby increasing investment in the country. As a result, the distribution of capital within the country increases, leading to higher inflows and ultimately economic growth. This suggests that property rights are an integral part of institutions, as they provide resources for the economy.

Communication costs are another important factor in a country's development agenda. A study by Liu showed that economic growth in the country is stronger due to lower communication costs in developing countries [9]. This is because financial transactions are more efficient as transaction costs decrease. This reinforces the fact that there is some economic stability in the country. Consequently, this leads to higher growth rates in some countries where trade costs are low. On the other hand, the same study conducted by Liu also found that lower transaction costs lead to capital inflows into the country. This leads to an increase in domestic output, which leads to economic activity at higher levels and higher levels of economic growth [9]. Consequently, smaller transaction costs require market efficiency and, thus, greater economic growth. For countries with strong and efficient institutions, communication costs also decrease with channel dependence. A study by Cuypers, found that transaction costs decreased significantly over time as the economy grew [10]. This is because road dependence leads to economic efficiency, leading to a more stable distribution of resources. This further reduces the cost of doing business in the economy and creates a sense of economic growth.

In institutional economics, a country's political stability is also an important determinant of a country's development. According to the study by Kyarem, a country's political stability has a significant positive effect on a country's economic growth in the short run [11]. This can be understood from research conducted in Nigeria between 1996 and 2017 using the ARDL model, which shows that greater political stability leads to higher governance. Moreover, there is a significant positive impact on economic growth and development because of political stability. This is because stable governance provides a predictable business environment in the economy. Such an environment helps build confidence among investors, leading to long-term investment. It is an important factor in the economic development of the country. Moreover, good governance also determines the economic and social outcomes of the country. As reported by De Guimarães, better governance leads to better and more sustainable economic growth [12]. This is because the laws governing existing institutions, such as government, are also intended to create social stability through the process of development. Therefore, the efficient use of resources leading to such good governance leads to sustainable development patterns in the country.

Institutions also play an important role in the functioning of the market because they allow for efficient allocation. According to the study by Chen, every economy aims to increase its productivity and achieve sustainable growth [13]. Efficient resource allocation is key to achieving this sustainable economic growth. According to a study in China, the country's rural areas experienced significant growth due to more efficient markets, resulting in better distribution of resources in the economy. This increase in agricultural production contributes to the country's economic growth, as does the income of individuals in the economy. Moreover, it is also important to understand that government efficiency plays an important role in the distribution of resources in a society. A study by

DOI: 10.54254/2753-7064/40/20242288

Palaniswamy and Krishnan found that the weakest institutional form is in resource-scarce communities [14]. On the other hand, communities with better institutions got a greater share of resources. These differences in resource allocation also led to changes in the development of the country. Consequently, the efficient allocation of resources is essential for healthy economic growth.

Institutions also play an important role in developing social capital. A study by Ahlerup suggests that social capital and institutions tend to develop simultaneously in the economy [15]. This comes from a pragmatic approach, where historical events provide guidance for institutional development in an economy. This in turn shapes the development of social capital within a country. This includes, improvements in education, health, and other social activities. Moreover, it is also understood that the acquisition of strong social capital leads to better economic outcomes. A study by Makiyan found that high levels of social capital and institutional quality have a strong positive relationship with a country's economic performance [16]. This is because greater social capital would mean better physical and human capital. This would promote a safe environment for citizens to operate more efficiently within an economy and contribute to economic growth. As a result, this shows that social capital has a substantial impact on the economic performance of a country.

In summary, the previously discussed literature shows that institutional characteristics like political stability and governance play a critical role in the development of a nation. However, there are limitations in the number of studies that show the impact that different forms of institutions have on countries. Moreover, the literature also lacks comparative studies between the two nations showing the impact of the different kinds of institutions. As a result, this particular study aims to analyze the impact that a centralized institution and a democratic institution would have on the development of a nation. Moreover, this would be addressed using the examples of China and the United Kingdom in a comparative study.

3. Methodology

The study would follow a mixed research design that would comprise both a comparative analysis of the two nations and a quantitative analysis.

The comparative analysis of this particular paper will be qualitative. Qualitative comparative research provides an understanding of the qualitative factors that will affect the outcome of the research. According to research by Thomann and Maggetti, it makes sense to measure external validity, internal validity, and argument consistency when using qualitative comparative analysis [17]. Such an approach ensures measured factors in research are robust and more accurately identify cause-and-effect relationships between variables. It also ensures widespread applicability. Consequently, comparative qualitative analysis is an important part of this methodological study. In this particular study, comparative qualitative analysis will examine how institutional characteristics lead to specific economic and social outcomes in a given country. This will help to identify the various causes of the results. Moreover, the same can be used to compare the causal models of different countries. The comparative qualitative analysis in this study will take precedence in examining the impact of institutions in the United Kingdom and comparing the results with those in China.

This particular study uses statistical data and statistical methods to investigate causal relationships between variables through quantitative analysis. According to Mohajan, quantitative analysis uses explanatory variables to generalize the results of different models [18]. This is because studies using statistical methods can validate models using such an approach. Moreover, the causal relationships identified by such an approach are much stronger and can be easily generalized. Consequently, the research in this particular study will examine the impact of global governance indicators on economic and social outcomes in China and the United States. The study uses regression analysis to examine the impact of various sovereignty indicators on economic indicators such as GDP, GDP per capita,

DOI: 10.54254/2753-7064/40/20242288

government expenditure, inflation, the human development index, etc. This will show the impact that organizations have on economic, economic and social development countries. Moreover, to understand the quality of institutions in the country, the study uses a combination of governance indicators such as political status, voice, accountability, and effective governance. The following regression equations are estimated for quantitative analysis:

$$\text{Gross Domestic Product}_{it} = \beta_1 + \beta_2\,(\text{Political Stability}_{it}) + \beta_3\,(\text{Voice and Accountability}_{it}) + \beta_4(\text{Government Effectiveness}_{it}) + \varepsilon_t \quad (1)$$

$$\text{Gross Domestic Product Per Capita}_{it} = \beta_1 + \beta_2\,(\text{Political Stability}_{it}) + \beta_3\,(\text{Voice and Accountability}_{it}) + \beta_4(\text{Government Effectiveness}_{it}) + \varepsilon_t \quad (2)$$

$$\text{Govenrment Expenditure}_{it} = \beta_1 + \beta_2\,(\text{Political Stability}_{it}) + \beta_3\,(\text{Voice and Accountability}_{it}) + \beta_4(\text{Government Effectiveness}_{it}) + \varepsilon_t \quad (3)$$

$$\text{Inflation Rate}_{it} = \beta_1 + \beta_2\,(\text{Political Stability}_{it}) + \beta_3\,(\text{Voice and Accountability}_{it}) + \beta_4(\text{Government Effectiveness}_{it}) + \varepsilon_t \quad (4)$$

$$\text{Human Development Index}_{it} = \beta_1 + \beta_2\,(\text{Political Stability}_{it}) + \beta_3\,(\text{Voice and Accountability}_{it}) + \beta_4(\text{Government Effectiveness}_{it}) + \varepsilon_t \quad (5)$$

4. Comparative Study

This part of the research will first examine the role of institutions in the development process of the country. Acquah found that institutions are an important part of economic development, especially in low-income and middle-income countries [19]. A study of 80 countries between 1980 and 2015 has revealed this. The study, which uses the General Propensity Score method, has further revealed that the different kinds of institutions have unique impacts on the growth levels of the country. As per the literature, it has been understood that institutional capacity impacts the political fronts as well as the level of governance in a nation. As a result, this also impacts the general efficiency of the nation with respect to the allocation of resources and transaction costs. Therefore, different kinds of institutions have their own unique impact on the development path.

In this study, the case of a centrally controlled institution is compared to a representative form of government. Moreover, a comparative study is conducted between the two to understand the unique impacts that each form of institution has on the developmental process. A study by Stewart, has revealed that both democratic and centrally controlled forms of institutions look towards development [20]. However, one uses political cooperation within an overarching community, whereas other sticks to a limited political community. This leads to a variation in the power level that each form of institution holds in the development process of a nation. As a result, it could be observed that both the United Kingdom and China have faced unique development levels throughout the years. The following segment of the comparative study would use various literature resources to understand the development of both nations from a historical perspective.

4.1. Development in the United Kingdom

The United Kingdom boasts a greater history in the development of its political and government structures. According to Jones and Norton, the United Kingdom faced a greater path dependency in order to develop its institutions [21]. This is because the vast historical timeline of the British government and political system led to a greater learning period for the nation. This involved a number of major revolutions that eventually led to the present state of the United Kingdom. Moreover, another study by Blackburn has revealed that the constitutional monarchy in the state has ensured a balance of power between the parliament and the monarchy [22]. This led to a strong form of

DOI: 10.54254/2753-7064/40/20242288

government effectiveness in the nation as well as a higher voice and accountability in the nation. As a result, the institutions in the United Kingdom represent a greater form of political stability, which led to the development process in the state.

The economic development process in the United Kingdom reached an advanced stance because of the greater path dependency of the nation. As per Gargano, the multi-level governance in the United Kingdom led to institutional arrangements that led to the development process in the nation [23]. Moreover, the parliament led to critical decision-making in a democratic manner that kept in mind the welfare of the majority of the population. As a result, there is a greater level of social and economic infrastructure development in the nation when compared to others. Furthermore, in another study by Wilkinson, it has been understood that the British economy, through its strong political and legal institutional framework, led to the establishment of high-quality education systems as well as healthcare systems [24]. This development in the public service utilities has enhanced the social capital and welfare of the nation. Moreover, the enhanced social capital was also supplementary to the economic development of the nation as one of the most powerful countries in the world. As a result, it could be understood that the representative government in the United Kingdom led to the dynamic economic growth of the nation.

In the present day, the United Kingdom remains one of the most critical economies in the world. As per the World Bank, the country has a GDP of 3.34 trillion USD with an economic growth rate of 0.1% [25]. The same source has also revealed that unemployment in the nation settled at 4.1% with inflation reaching 6.8%. In recent times, the forces of globalization have led to the weakening of the British economy. This also comes as the country has faced a decline in its government efficiency over the years (Figure 1). This fall in government efficiency also brought out a number of socioeconomic problems in the nation. Despite having a strong form of institution, the United Kingdom faced challenges with respect to the high cost of living. This showed that the United Kingdom faced a decline in efficiency in terms of resource allocation [26]. This led to a higher transaction cost within the economy, which ultimately led to the weakening of the British economy.

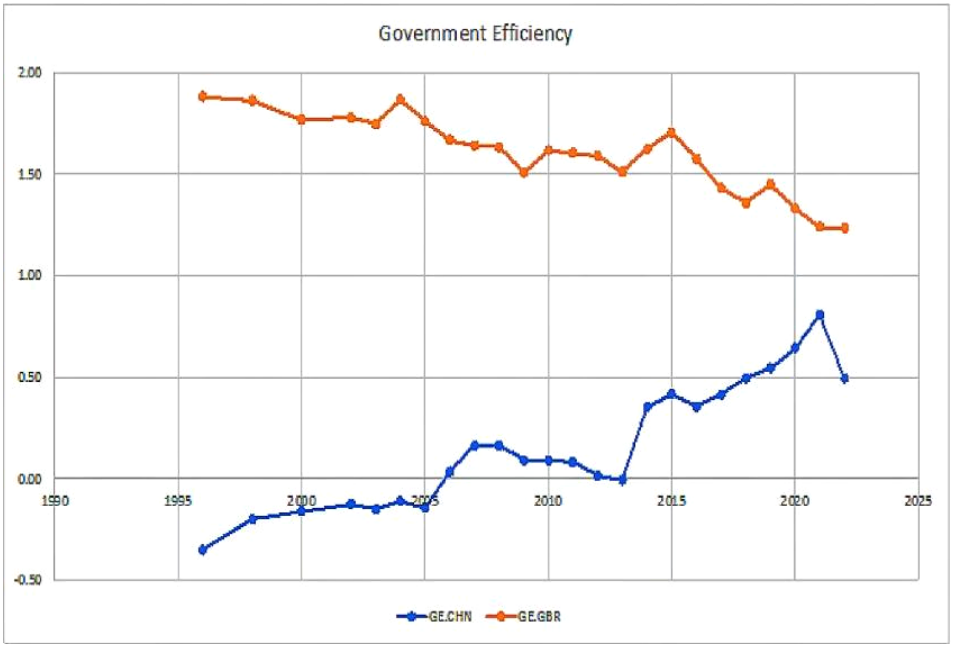


Figure 1: Government efficiency index.

DOI: 10.54254/2753-7064/40/20242288

4.2. Development in China

Historically, the Chinese economy has followed the protected path of domestic centralization. According to Suisheng, China's economy faces a hierarchy of governance that relies on a top-down approach [27]. This means that systems with the highest levels of governance in the country and responses from the lowest levels are not generally considered. Using such a top-down approach, unlike democratic institutions, leads to more efficient and faster decision-making at the national level. Moreover, such an approach provides guidance for large-scale projects in the country. Consequently, the historical development of centralized control in China has contributed to the country's current economic growth.

The setup of a hierarchical administration in the Chinese economy also leads to massive transaction costs for the nation within the decision-making process. As per Rudbeck, the transaction cost of controlling the flow of information and maintaining centralized control is high for economies like China [28]. This is because such institutions require a high level of monitoring and enforcement. As a result, this leads to a loss of voice and accountability in a nation and also leads to a fall in economic stability.

The centrally controlled institutions also led to a substantial level of rapid development in an economy like China. As per Wilson, the Chinese economy has shown a positive relationship between high-quality governance and economic performance [29]. This is because high-quality governance leads to the efficient execution of projects in the nation, which eventually propels the development path. Moreover, as per Figure 1, it has been realized that the Chinese economy has experienced a rise in government efficiency over the past decade. This is because of the rapid execution of developmental projects in the nation. Thus, this shows that the centralized institutions of China play an integral part in the development process of the nation.

5. Analysis

The particular study uses data from the World Bank in order to provide the statistical analysis. The data used in the analysis are governance indicators like Political Stability, Voice and Accountability and Government Effectiveness [30]. On the other hand, economic data from the World Bank are also considered, which comprise Gross Domestic Product, Gross Domestic Product per capita, Government spending, Inflation Rate, and the Human Development Index. The data has been collected between 1996 and 2022 for the countries of China and the United Kingdom for statistical analysis [30].

The statistical analysis for the study has been divided into two segments. The first segment consists of the univariate analysis that shows the descriptive statistics of the variables used in the study. Table 1 showcases the summary of the Governance indicators used in the study.

Table 1: Descriptive Statistics of Governance Indicators for China and United Kingdom.

Variable	Obs	Mean	Std_Dev	Min	Max
PSCHN	24	-0.4422	0.138775	-0.65706	-0.09785
PSGBR	24	0.47458	0.253487	0.077565	1.033106
VACHN	24	-1.585	0.108908	-1.75	-1.36
VAGBR	24	1.31865	0.080252	1.195277	1.597446
GECHN	24	0.16483	0.305312	-0.34865	0.809332
GEGBR	24	1.60025	0.186868	1.238635	1.882196

DOI: 10.54254/2753-7064/40/20242288

From the analysis, it can be revealed that the mean Political Stability in China is -0.44, whereas the same for the United Kingdom is 0.47. The data for China comes with a standard deviation of 0.138 whereas the data for the UK comes with a standard deviation of 0.253. On the other hand, the Voice and Accountability indicator showed a mean of -1.58 for China with a standard deviation of 0.10. The same for the United Kingdom was 1.31, with a standard deviation of 0.08. Finally, the Chinese economy showed a mean government efficiency of 0.16 over the period of the study. During the same time period, the United Kingdom showed a mean government efficiency of 1.60.

The study further deviates into a multivariate analysis that finds the impact of various Governance indicators on the economic and social outcomes of the nation. Table 2 shows the impact of the indicators in the United Kingdom. On the other hand, Table 3 shows the same for China.

Table 2: Regression of Governance Indicators on Economic and Social Indicators for the United Kingdom.

	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
GDP	-1.130	0.272	0.720	0.479	-3.500	0.002***
GDPPCI	-3.142	0.043**	-2.937	0.528	-4.031	0.037**
CPI	1.197	0.472	1.417	0.786	-3.861	0.071*
Govt. Exp.	1.38e^11	0.154	9.31e^10	0.755	-4.33e^10	0.001***
HDI	-0.037	0.032**	0.003	0.959	-0.105	0.000***

From Table 2, it can be seen that government efficiency has a statistically significant effect on all the indicators for the United Kingdom. Political stability has significant indicators for GDP, PCI, and HDI. As per political stability, the increase in the parameter by 1% leads to a fall in GDP, PCI for the UK by 3.14%. On the other hand, an increase in political stability in UK leads to a fall in HDI by 0.03%. For Government Efficiency, an increase in the same leads to a fall in GDP by 3.5%, whereas the GDPPCI falls by 4.03%. Negative effects have also been recognized for CPI, government expenditure, and HDI.

Table 3: Regression of Governance Indicators on Economic and Social Indicators for China

	Political Stability		Voice and Accountability		Government Efficiency	
	coef.	p-value	coef.	p-value	coef.	p-value
GDP	-3.37e^12	0.472	8.80e^12	0.182	1.81e^13	0.000***
GDPPCI	-0.031	0.985	2.372	0.304	2.225	0.001***
CPI	2.920	0.548	-3.890	0.564	-1.208	0.497
Govt. Exp.	4.12e^13	0.588	1.53e^12	0.155	3.02e^12	0.000***
HDI	-0.082	0.179	-0.015	0.853	0.211	0.000***

From Table 3, it can be seen that political stability, voice, and accountability do not have any statistical significance on the economic and social indicators for China. However, government efficiency leads to statistically significant results for all the indicators in China. A 1% rise in government efficiency leads to a rise in GDP by 1.81e^13points, whereas the GDPCPI increases by 2.225%. The CPI falls by 1.208% when government efficiency rises and finally, it can be recognized that government expenditure and HDI also rise by 3.02e^12 and 0.211, respectively, with a rise in governance.

DOI: 10.54254/2753-7064/40/20242288

6. Results and Discussion

This particular chapter of the study deals with the research results. From the research, it could be realized that a centrally controlled institution and a democratic institution have unique impacts with respect to development. This could be understood further using the analysis of the comparative results and the statistical results.

The comparative analysis of the study shows that the institutions in the United Kingdom have been democratic in nature historically. This led to a greater level of government efficiency, voice, and accountability, as well as political stability for the United Kingdom. As per Figure 1, it has been further recognized that these parameters of the United Kingdom have been substantially higher than those of China. This is mainly because the historical development of the representative government in the United Kingdom led to a path of development where the institutions learned from historical events. This laid the foundation for strong institutions, which led to better socioeconomic outcomes for the nation. Moreover, the representative form of institution highly operates on feedback from the lower levels as well as the citizens. This led to the sustainable development of the United Kingdom as a developed nation.

On the other hand, China faced an institution that was gradually new when compared to the United Kingdom. The Chinese economy faced centralized planning historically, but the use of government institutions as a central planner was relatively new as the country gained independence in 1949. Despite starting the development process late, the nation has faced substantial economic growth in the past few decades because of its institutional capacity. The centralized control ensured efficiency in the nation and imposed the development of heavy industries in the nation. Furthermore, the strategic opening up of the economy led to the growth of exports, which led to substantial income for the Chinese economy. This led to a spillover effect in the economy, leading to a greater level of investment and a circular flow of money. Overall, the high efficiency of the Chinese institutions, followed by the strong property rights and stringent laws, led to the rapid industrialization and development of China.

The statistical analysis shows that the average governance indicators of the United Kingdom are better than those of China. However, from Figure 1, it can be seen that there is a fall in average government efficiency and political stability in the UK. During the same period of time, government efficiency improved drastically in China. This led to positive outcomes for social and economic indicators in China (Table 3). The greater government efficiency led to a more appropriate allocation of resources, causing a positive impact on economic and social indicators. On the other hand, the falling government efficiency in the United Kingdom comes from the fall in political stability. This leads to adverse effects on socioeconomic indicators, as the government is inefficient and unable to allocate resources in a proper manner. As a result, there is a negative impact of governance indicators on social and economic parameters in the United Kingdom.

7. Conclusion

There is a substantial difference in economic and social outcomes with a change in institutional quality. Democratic institutions like those in the United Kingdom followed a historical path of development. This led to a substantial level of maturity in institutions, which allowed for greater socioeconomic outcomes for the nation. However, the democratic form of governance is not always efficient, as has been understood in the case of the United Kingdom. As political stability in the nation fell, government efficiency also fell. This led to adverse effects on social and economic parameters in recent times. On the other hand, it could be realized that China has faced a centrally controlled institution over the years. Despite being a centrally governed state historically, the independence of China under a government structure was comparatively new. This young establishment of institutions

DOI: 10.54254/2753-7064/40/20242288

showed a number of vulnerabilities in China, as the major urban spaces remained developed while the central areas of the nation remained highly underdeveloped. Despite these shortcomings, it could be understood that the institutions in China remain highly efficient because of the centralized control. This ensures that the allocation of resources is optimal and that the economic and social outcomes are also favorable. This could be seen in the case of China, where an efficient government led to better outcomes for the economy and society. As a result, this shows that various forms of institutions lead to unique levels and paces of development across countries.

This particular paper on institutional quality and its impact on economic development has faced a number of practical hindrances. Firstly, the usage of historical context and data towards the development of the institutions has not been done in detail. Moreover, the impact of the institutions on specific forms of societal parameters has not also been measured. Finally, the study only considers centrally controlled institutions and democratic institutions. However, there are also other institutions that are present in the form of governments. Future studies can delve into these limitations and provide an even more dynamic study.

Overall, this particular research has a number of significant practical implications. Firstly, the research allows a deep understanding of government and political structures. The research shows how the efficiency and capability of the government and other institutes lead to decision-making within an economy, which impacts societal and economic outcomes. As a result, having knowledge of the different outcomes would lead to better policy-making as well. Moreover, the results could also be generalized and used from a broader perspective. The findings could be related to other economies and their political stability as well as their government efficiency. The same could also be used to draw outcomes from socioeconomic factors in these economies. Finally, the findings could also be used for the development of social policy, as government efficiency leads to a unique level of allocation of resources for each country. Therefore, predictions could be made for social development on the basis of the information provided.

References

[1] *Ansell, C. (2020) Institutionalism. The Palgrave handbook of EU crises, 135-152.*

[2] *Zergawu, Y. Z., Walle, Y. M., & Giménez-Gómez, J. M. (2020) The joint impact of infrastructure and institutions on economic growth. Journal of Institutional Economics, 16(4), 481-502.*

[3] *Abbott, K. W., & Faude, B. (2021) Choosing low-cost institutions in global governance. International Theory, 13(3), 397-426.*

[4] *Baland, J. M., Bourguignon, F., Platteau, J. P., & Verdier, T. (2020) Economic Development and Institutions. The handbook of economic development and institutions, 1.*

[5] *Wlezien, C., & Soroka, S. N. (2020) Political institutions and the opinion–policy link. In Assessing Political Representation in Europe (pp. 191-216). Routledge.*

[6] *Schofer, E., Ramirez, F. O., & Meyer, J. W. (2021) The societal consequences of higher education. Sociology of Education, 94(1), 1-19.*

[7] *Malizia, E., Feser, E. J., Renski, H., & Drucker, J. (2020) Understanding local economic development. Routledge.*

[8] *Delis, M. D., Hasan, I., & Ongena, S. (2020) Democracy and credit. Journal of Financial Economics, 136(2), 571-596*

[9] *Liu, S. (2023) Property Rights, Behavior, and Economic Performance. In Land System Reform and China's Economic Development (pp. 89-104). Singapore: Springer Nature Singapore.*

[10] *Cuypers, I. R., Hennart, J. F., Silverman, B. S., & Ertug, G. (2021) Transaction cost theory: Past progress, current challenges, and suggestions for the future. Academy of Management Annals, 15(1), 111-150.*

[11] *Kyarem, R., Sani, I. A., Oyolola, F., & Lawal, O. (2020) Political elites' corruption, political stability and economic growth in Nigeria: bound testing approach. Acta Universitatis Danubius. Œconomica, 16(2).*

[12] *De Guimarães, J. C. F., Severo, E. A., Júnior, L. A. F., Da Costa, W. P. L. B., & Salmoria, F. T. (2020) Governance and quality of life in smart cities: Towards sustainable development goals. Journal of Cleaner Production, 253, 119926.*

[13] *Chen, C., Restuccia, D., & Santaeulàlia-Llopis, R. (2023) The effects of land markets on resource allocation and agricultural productivity. Review of Economic Dynamics, 45, 41-54.*

DOI: 10.54254/2753-7064/40/20242288

[14] Palaniswamy, N., & Krishnan, N. (2012) Local politics, political institutions, and public resource allocation. Economic Development and Cultural Change, 60(3), 449-473.
[15] Ahlerup, P., Baskaran, T., & Bigsten, A. (2021) The Quality of Government and Economic Growth. The Oxford Handbook of the Quality of Government, 359.
[16] Makiyan, S. N., Karbalaei Badi, F., & Bahrami, F. (2021) Social Capital and Economic Growth: A Comparative Study between High and Low Social Capital Countries. Quarterly Journal of The Macro and Strategic Policies, 9(33), 184-209.
[17] Thomann, E., & Maggetti, M. (2020) Designing research with qualitative comparative analysis (QCA): Approaches, challenges, and tools. Sociological Methods & Research, 49(2), 356-386.
[18] Mohajan, H. K. (2020) Quantitative research: A successful investigation in natural and social sciences. Journal of Economic Development, Environment and People, 9(4), 50-79.
[19] Acquah, E., Carbonari, L., Farcomeni, A., & Trovato, G. (2023) Institutions and economic development: new measurements and evidence. Empirical Economics, 65(4), 1693-1728.
[20] Stewart, K. L. (2021) Democratic and autocratic nation building. Nationalities Papers, 49(2), 205-212.
[21] Jones, B., & Norton, P. (2014) Politics Uk. Routledge.
[22] Blackburn, R. (2022) The Constitutional Role and Working of the Monarchy in the United Kingdom. In Jahrbuch des öffentlichen Rechts der Gegenwart (pp. 181-201). Mohr Siebeck.
[23] Gargano, G. (2021) The bottom-up development model as a governance instrument for the rural areas. The cases of four local action groups (LAGs) in the United Kingdom and in Italy. Sustainability, 13(16), 9123.
[24] Wilkinson, R. G. (2020) The impact of inequality: How to make sick societies healthier. Routledge.
[25] World Bank (2024a) Documents & Reports. World Bank. https://documents.worldbank.org/en/publication/documents-reports
[26] Wright, L., Steptoe, A., & Fancourt, D. (2020) Are we all in this together? Longitudinal assessment of cumulative adversities by socioeconomic position in the first 3 weeks of lockdown in the UK. J Epidemiol Community Health, 74(9), 683-688.
[27] Suisheng, Z. (2019) China's central-local relationship: a historical perspective. In Changing central-local relations in China (pp. 19-34). Routledge.
[28] Rudbeck, J., Mukherjee, E., & Nelson, K. (2016) When autocratic regimes are cheap and play dirty: The transaction costs of repression in South Africa, Kenya, and Egypt. Comparative Politics, 48(2), 147-166.
[29] Wilson, R. (2016) Does governance cause growth? Evidence from China. World Development, 79, 138-151.
[30] World Bank (2024b) World Bank Development Indicators. World Bank. https://databank.worldbank.org/source/world-development-indicators

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242277

Opioid-Induced Neuroplasticity: Insights from Animal Models

Zhaolin Yang[1,a,*]

[1]*Department of Psychology, McGill University, Montreal, Canada*
a. Zhaolin.yang@mail.mcgill.ca
**corresponding author*

Abstract: Synaptic plasticity is defined as the modification of the transmission of synapses. It has been proven to be strongly associated with learning. Thus, drug-evoked synaptic plasticity in brain reward circuits can establish persistent learning of addictive drugs, reflecting the neural basis underlying addiction. The mesolimbic dopamine pathway has been widely indicated to be strongly associated with opioid use disorder (OUD) and other drug addictions. The paper focuses on discussing the drug-evoked neural plasticity underlying two important stages called intoxication and withdrawal which are critical for addiction and reinstatement of drug use respectively. The paper first explores the neural basis of OUD, emphasizing drug-induced plasticity at glutamate and Gamma-aminobutyric acid (GABA) synapses on neurons of key substrates in the pathway and how they influence mesolimbic dopamine (DA) neuron transmission. Then, the review discussed withdrawal-induced neuroplasticity and reorganization of associated neuron circuits, which explain deficits led by withdrawal from opioid administration. An overall understanding of drug-evoked synaptic plasticity in key brain circuits in the development of addiction helps find possible therapeutic methods to prevent the initiation of OUD and reinstatement.

Keywords: opioid use disorder, mesolimbic pathway, dopamine, synaptic plasticity.

1. Introduction

The hallmark of opioid use disorder (OUD) is the persistent use of opioids notwithstanding the negative consequences. Specifically, OUD is defined as the result of cumulative exposure to opioid drugs, characterized by impulsive preparatory and consummatory motivations for drugs that reflect role dysfunction. OUD is a well-recognized severe problem since it severely affects public and individual health. It is estimated that around 26.8 million people globally were affected by Opioid Use Disorder (OUD) in 2016, and more than 100,000 individuals perish each year from opioid overdoses [1]. In the early stage of addiction, addicts consume drugs to obtain positive effects. Abrupt drug discontinuation or gradual tarping tends to produce withdrawal syndrome, resulting in physical and psychological deficits and increasing the risk of relapse [2].

Positive and negative reinforcement, as two key contributors to addiction, all reflect presynaptic and postsynaptic plasticity, at least in part [3]. The former is defined as increased drug-seeking triggered by drug-induced subject euphoria, while the latter is defined as the alleviation of adverse effects caused by withdrawal. Both types of reinforcement contribute to the development of addiction. Positive reinforcement is essential in the association with recreational drug use, whereas negative

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242277

reinforcement is increasingly essential in the presence of addiction to drive compulsive drug-seeking [4]. because both types of reinforcement are strongly associated with reward, it is unequivocal that mesolimbic dopamine (DA) pathways from the ventral tegmental area (VTA) to the nucleus accumbens (NAc) are crucial for developing addiction since they are essential for incentive salience. They are pivotal for the reinforcing and rewarding properties of opiates and other drugs [4]. Meanwhile, this system is also pivotal for regulating motivational aspects of cessation of drug exposure, contributing to the reinstatement of drug use. A plausible explanation is that DA is the candidate for increasing the brain stimulation reward threshold. Withdrawal from opioid exposure, resulting in a state of anhedonia contributing to relapse although the specific neurochemical basis remains undefined. Together, these findings imply that the disturbance of the mesolimbic DA neuron activity level may lead to maladaptive motivation and encourage reinforcement [5].

Although reinforcement undoubtedly depends on mesolimbic DA neurons, the capacity of glutamate to impact the activity of DA neurons has been increasingly recognized [3]. The development of addiction requires the participation of glutamate to alter the synaptic strengthening of DA neurons to impact the activity of DA neurons. Or glutamate alters the synaptic excitability of gamma-aminobutyric acid (GABA) neurons, reducing DA neurons' activity, and enabling an indirect regulation of the activity of DA neurons.

The paper presumes that opioid exposure induces synaptic plasticity with reflected behavioral alternations. This paper attempts to review previous studies on animal models and combine them to understand how modifications in neuron activities contribute to maladaptive motivation. Investigation into the animal models (mice) provides an opportunity to study it, since the activity of neurons in people with addiction cannot be tested directly because of limitations of technology and ethical issues. In short, this review summarizes associated studies on opioid-evoked synaptic plasticity to establish a coherent understanding of the biological basis underlying OUD, which is beneficial to neurobiological and pharmacological fields.

2. Learning Mechanism

Many studies have demonstrated the important role the mesolimbic DA pathway from the VTA to the NAc and other associated limbic brain regions play in the development of addiction [6]. Mesolimbic DA neurons have been recognized to play a critical role in regulating the rewarding and incentive value of opioids [4, 6]. It has been recognized that regardless of their chemical makeup or molecular targets, all drugs initially enhance DA concentrations in the VTA itself and VTA projection regions in the mesolimbic pathway.

Glutamate, as the primary modulator of the synaptic plasticity underlying learning phenomena, has its role in mediating the activity of DA neurons by altering the synapse excitability [7]. Transportation of glutamate plays a fundamental role in inducing and maintaining LTP and LTD at synapses, which are two important learning and memory mechanisms that can impact how DA neurons respond. It indicates that glutamatergic neurotransmission is a necessary part of developing and preserving opioid-associated memories [8]. It has been well-recognized that opioid-evoked LTP and LTD are two learning processes mainly reflecting synaptic plasticity. Although LTP and LTD were discovered initially in the hippocampus and are thought particularly essential for the formation of memories with the capacity to store a huge amount of information [9]. Their participation in other brain circuits, including the mesolimbic DA pathway, has been increasingly recognized. The former refers to the persistent strengthening of synaptic excitability, while the latter refers to the selective weakening of synapses [10].

Ionotropic glutamate receptor-dependent LTP and LTD can be found in the synapses receiving glutamate inputs on VTA and NAc neurons. Indeed, LTP and LTD can be exhibited at inhibitory and excitatory synapses to alter the synaptic strength to facilitate or suppress synaptic transmission by

DOI: 10.54254/2753-7064/40/20242277

strengthening or weakening synapses respectively. In the mesolimbic pathway, opioids evoke synaptic plasticity at inhibitory and excitatory synapses of key brain substrates including the VTA and the NAc. The latter is recognized to be innervated by glutamatergic inputs mainly from the prefrontal cortex, lateral hypothalamus, and laterodorsal tegmental nucleus [6]. Now, how opioid exposure changes the synapses of VTA and NAc neurons respectively, and induces long-lasting alterations in synaptic transmission will be discussed specifically.

2.1. Plasticity at Excitatory Synapse in VTA

Previous studies have well recognized that to affect VTA DA neurons' activity in a direct approach, opioid exposure is sufficient to induce LTP and LTD at the excitatory synapses [6]. Administration of N-methyl-D-aspartate (NMDA) receptor antagonists prevented the excitatory synapses' potentiation of the VTA DA neurons [11]. It implied that opioid exposure potentially induces an NMDAR-dependent LTP at the excitatory synapse of VTA DA neurons [6]. The NMDA receptor-dependent LTP requires the activation of NMDA receptors to insert α-amino-3-hydroxy-5-methyl-4-isoxazole propionic acid (AMPA) receptors through activating intracellular signaling cascades as the postsynaptic membrane is dramatically depolarized to remove magnesium block of NMDA receptors. The LTP-evoked synaptic strengthening is reflected by increased AMPA/NMDA receptors excitatory postsynaptic currents (EPSCs) ratio [6].

A significant increase in this ratio was shown 24 hours after only a single opioid administration [12]. It was potentially because of an upregulated conductance of AMPA receptors. Opioid-evoked enhanced levels of GluR1-AMPARs (GluR2-lacking) incorporated at glutamate synapses on VTA DA neurons [10]. AMPA receptors lacking GluR1 were observed to replace a portion of synaptic receptors constitutively [13]. Finally, they show a great capacity to change synaptic plasticity since GluR2-lacking AMPA receptors have a greater Ca+ permeability. Additionally, the opioid-evoked decrease in NMDA receptor-regulated EPSCs might also provide a plausible explanation of why this ratio was increased [10]. Or both the former and the latter result in the increase of this ratio.

Postsynaptic plasticity is also reflected by the alteration in metabotropic glutamate receptors. The mGluR-LTD was presumed to be exhibited at excitatory synapses of VTA DA neurons. Activation of mGluR1 receptors in the VTA was recognized to sufficiently reverse the replacement of the GluR2-containing AMPA receptor with the GluR2-containing AMPA receptor. Hence, persistent synaptic strengthening possibly implies that the signaling of mGluR2 is depressed by opioid exposure, facilitating the induction of NMDA receptor-dependent LTP at glutamate synapses on VTA DA neurons [10].

2.2. Plasticity at Inhibitory Synapse in VTA

Around 30%-35% of the cells in the VTA are GABAergic neurons inhibiting the DA neurons locally [14]. Hence, controlling GABA activities can indirectly impact the activity of VTA DA neurons. Drug-evoked alterations in GABAA receptor synapse on VTA DA neurons are thought to regulate DA neurons' activity indirectly. Repeated cocaine exposures over five to seven days daily significantly reduced GABAA receptor-regulated inhibitory postsynaptic currents (IPSCs) on VTA DA neurons. This enhanced discharge of DA neurons in response to a fixed stimulus is facilitated by the reduction in inhibition [15].

Furthermore, chronic opioid exposure promotes endocannabinoid-dependent LTD at GABAA receptor synapses, disinhibiting the activity of DA neurons [16]. Animals previously exposed to morphine exhibited an absence of robust NMDAR-dependent GABAA LTP which was originally exhibited in slices from naïve animals [6, 10]. This LTP requires the postsynaptic excitatory terminal participants to produce nitric oxide synthase (NOS), which can further produce nitric oxide (NO).

DOI: 10.54254/2753-7064/40/20242277

NO then moves to nearby presynaptic inhibitory terminals and turns on guanylate cyclase (GC). This raises cyclic GMP (cGMP), which in turn greatly increases the release of GABA at the presynaptic site. Therefore, the decreased presynaptic transmission of GABA caused by disruption of the interaction between postsynaptic NOS and presynaptic GC potentially explains why this LTP was removed with exposure to opioids. This was thought to happen because either GC was no longer able to sense diffusible NO. Or it has been lost from presynaptic GABA-releasing terminals [6]. Intriguingly, this LTP was also observed to be absent in VTA 24 hours after in vivo administration of other drugs, such as ethanol and nicotine [17]. Together, NMDA receptor-dependent LTP at excitatory synapses on VTA DA neurons, and the depression at GABA synapses all contribute to the enhancement of activity of VTA DA neurons [6].

2.3. Synaptic Plasticity in the NAc

Synaptic plasticity which contributes to maladaptive reparatory and consummatory responses to drugs can also be found in the NAc, a substrate appearing essentially for mediating the expression of drug-seeking behavior. Current studies have suggested that the NAc integrates the glutamatergic signals from the cortex and the dopaminergic signals from the VTA. The synaptic plasticity capacity is progressively altered to a persistent functional form of rigidity ('crystallization') of drug-associated memory because of the progressive modification of drug-associated information processing that is induced by chronic exposure to drug abuse [8].

Unlike the measured upregulation at glutamate synapses on VTA DA neurons, a significantly decreased AMPA/NMDA ratio was observed in the NAc 24 hours after the last administration of opioids, whereas this ratio exhibited a significant increase conversely in protracted withdrawal (10-14 days) [10]. The decreased ratio is thought to be a result of the persistent increase of this ratio in the VTA since enhanced excitation of VTA projections is widely postulated to potentially modify the threshold for the initiation of NAc plasticity by influencing the excitability of the neural circuit [10, 18]. However, this reduction is also assumed to be the outcome of the exposure of NR2B-containing NMDA receptors on the corresponding postsynaptic membrane. This subunit is known to have higher single-channel conductance with a longer opening time. therefore, the insertion of NR2B-containing NMDA receptors decreases this ratio by increasing the denominator of this ratio [10].

Due to the insertion of NR2B-containing NMDA receptors, silent synapses were observed to dramatically express [10]. Silent synapses are characterized by the capacity to express currents that were mediated by NMDA receptors, despite the lack of involvement of AMPA receptors. This feature offers enhanced synaptic transmission, contributing to LTP [10]. This is possibly one explanation for the upregulated proportion of AMPA/NMDA in protracted withdrawal. It was found that after 24-48 hours of withdrawal from repeated cocaine injections that were noncontingent, high amounts of synapses with remarkable activity were preferentially produced in the NAc shell with GABAergic neurons mediating drug-seeking [10]. Moreover, drug-evoked altered astrocytic-mediated synaptogenic signaling pathway, including the drug-evoked release of thrombospondin-2 activating its corresponding receptor alpha2delta-1, which is also necessary for generating these new silent synapses [19]. Opioid-evoked plasticity in neurocircuits during withdrawal will be further discussed below.

3. Neural plasticity Underlying Withdrawal

The NAc shows distinct structural properties from the VTA [20]. The Nucleus NAc contains approximately 95% of GABAergic medium spiny neurons (MSNs). Certain limbic areas including the prefrontal cortex, the ventral subiculum, the hippocampus, and the basolateral amygdala provide glutamatergic inputs to it [10]. Furthermore, the location of MSNs and what they contain can be

DOI: 10.54254/2753-7064/40/20242277

further divided into the direct pathway (dMSNs) or the indirect pathway (iMSNs). Direct pathway mainly expresses MSNs containing D1 receptors (D1-MSNs). Habenula-projecting globus pallidus (GPh) is a region that is important for evaluating action outcomes contributing to reward learning is indicated to be essential for drug-seeking, and it receives inputs from striosomal dMSNs [21-22].

One to three days after withdrawal from morphine administration in a repetitive manner, optogenetics observed a substantial increase in the amplitude of this pathway's inhibitory postsynaptic currents, implying a withdrawal-induced enhancement of striatopallidal GABAergic transmission [23]. The same result was also observed in withdrawal from chronic fentanyl self-administration. However, withdrawal from chronic voluntary fentanyl administration recruited the entire striatal dMSNs, evidenced by increased tagged dMSNs and their ratio to all dMSNs. Fentayl-induced potentiation of inhibitory inputs to midbrain DA neurons was also found, evidenced by a significant decrease in the firing of substantia nigra (SNc) as D1-MSNs received optogenetic stimulation. Therefore, this withdrawal-induced striatonigral plasticity tends to suppress DA transmission and eventually induces negative psychological effects, and partly contributes to negative reinforcement. Besides, it was found that the fentanyl's recruitment of striatal dMSN tended to evoke long-lasting opioid-related conditional memories because all mice receiving fentanyl administration showed significantly higher conditional place preference (CPP) scores, compared to mice receiving saline administration after 10 and 31 days of withdrawal. This may explain why OUD is prone to be triggered when opioid-associated cues exist [23].

Cell-type-specific plasticity can be induced by opioid exposure and withdrawal. Electrophysiological data revealed that 24 hours after five-day morphine exposure, the frequency of miniature excitatory postsynaptic currents (mEPSCs) on D2-MSNs but not D1-MSNs, was significantly reduced. In contrast, the intrinsic membrane excitability of D2-MSN was significantly increased during abstinence. The final functional output of D2-MSNs in response to synaptic inputs, which encodes aversion to natural stimuli in withdrawal, remained unchanged since it was observed that D2-MSNs of mice receiving saline and morphine showed no significant difference in the number of action potential (AP), as well as the rheobase (minimal current to elicit AP) and chronaxie. (time eliciting AP by using a current double the rheobase) [24]. These findings together, on the one hand, reveal cell-type-specific intrinsic and extrinsic changes in circuits mediating reward. On the other hand, they demonstrate the existence of a possible neural homeostasis that maintains basal levels of functional output in NAc D2-MSNs. However, whether this balance results in deficits when abstinence duration increases remains unclear [24].

It is recognized that projection from the paraventricular thalamus (PVT) to the NAc is essential for driving aversion and opioid-related contextual memories [25]. Mice that received heroin self-administration and then received abstinence and extinction training respectively. The latter is defined as a condition with broken contingency between preparatory responses to drugs and the practical delivery of the drug reward [25]. D1-MSN activity is in general associated with drug-seeking behavior. Related synaptic plasticity was found in another withdrawal model called extinction. It is recognized that projection from the paraventricular thalamus (PVT) to the NAc is essential for driving aversion and opioid-related contextual memories [25]. Activating this pathway optogenetically still drove aversion, contributing to drug seeking. This was evidenced by the induction of real-time conditional place aversion (rtCPA) and significantly increased seeking for heroin in mice that received abstinence, but not extinction. This was because the extinction itself had already depressed D1-MSNs, evidenced by significantly decreased EPSCs of D1-MSNs, but not D2-MSNs after the LTD protocol in the condition of abstinence, but not in the condition of extinction. Together, these findings suggests that extinction training potentially induced neural plasticity within the PVT-NAc pathway, which is originally an important contributor to the reinstatement of heroin, to alter the function of this pathway by depressing D1-MSN transmission [25].

DOI: 10.54254/2753-7064/40/20242277

4. Conclusion

This paper aims to provide an overall understanding of opioid-evoked synaptic plasticity by reviewing associated studies in this field. Studies have demonstrated that opioid-evoked synaptic plasticity on neurons of key substrates, mainly the VTA and NAc, is causally associated with drug abuse since the alterations converge to mediate the activity of mesolimbic DA neurons directly by upregulating excitatory synapses or indirectly by downregulating inhibitory synapses in the development of addiction. This is especially true for the VTA because the VTA contains both DA neurons and GABA neurons. Opioid exposure is adequate to induce LTP at the excitatory synapses of VTA DA neurons and LTD at the synapses of VTA GABA neurons. Together, the upregulation of VTA excitatory synapses and the downregulation of inhibitory synapses contribute to facilitating mesolimbic DA transmission. Opioid-induced plasticity in the NAc is characterized by alterations in the ratios of AMPA/NMDA receptors as well as silent synapses' formation, which facilitate the formation of LTP in protracted withdrawal, and partly contributing to the negative reinforcement and facilitating the reinstatement of opioids. Withdrawal-induced neural plasticity is also reflected in the alterations in neurocircuits important for reinforcement and reward learning. For instance, withdrawal from chronic opioid administration potentiates the transmission of GABAergic neurons in the NAc-GPh pathway. In addition, withdrawal can also induce plasticity in the subtypes of NAc MSNs, suggesting the capacity of withdrawal to induce cell-type specific neural plasticity.

Other factors that potentially affect the expression of synaptic plasticity are required in the future. The likelihood that the withdrawal-induced neuroplasticity persists with the increase in withdrawal durations and the alternate effect of synaptic plasticity in the protracted withdrawal should be further studied. Moreover, the role of other factors, such as gender and opioid exposure history in impacting withdrawal symptoms and neuroplasticity, possibly contribute to reinstatement of drug use.

References

[1] *Strang, J., Volkow, N.D., Degenhardt, L., Hickman, M., Johnson, K., Koob, G.F. and Walsh, S.L. (2020). Opioid use disorder. Nature reviews Disease primers, 6(1), 3.*

[2] *Cosci, F. and Chouinard, G. (2020). Acute and persistent withdrawal syndromes following discontinuation of psychotropic medications. Psychotherapy and psychosomatics, 89(5), 283-306.*

[3] *Koob, G.F. and Volkow, N.D. (2010). Neurocircuitry of addiction. Neuropsychopharmacology, 35(1), 217-238.*

[4] *Nestler, E.J., Hope, B.T. and Widnell, K.L. (1993). Drug addiction: a model for the molecular basis of neural plasticity. Neuron, 11(6), 995-1006.*

[5] *Jentsch, J.D. and Taylor, J.R. (1999). Impulsivity resulting from frontostriatal dysfunction in drug abuse: implications for the control of behavior by reward-related stimuli. Psychopharmacology, 146, 373-390.*

[6] *Kauer, J.A. and Malenka, R.C. (2007). Synaptic plasticity and addiction. Nature reviews neuroscience, 8(11), 844-858.*

[7] *Kalivas, P.W., LaLumiere, R.T., Knackstedt, L. and Shen, H. (2009). Glutamate transmission in addiction. Neuropharmacology, 56, 169-173.*

[8] *Chiamulera, C., Piva, A. and Abraham, W.C. (2021). Glutamate receptors and metaplasticity in addiction. Current Opinion in Pharmacology, 56, 39-45.*

[9] *Malenka, R.C. (1994). Synaptic plasticity in the hippocampus: LTP and LTD. Cell, 78(4), 535-538.*

[10] *Madsen, H.B., Brown, R.M. and Lawrence, A.J. (2012). Neuroplasticity in addiction: cellular and transcriptional perspectives. Frontiers in molecular neuroscience, 5, 99*

[11] *Simmler, L.D., Li, Y., Hadjas, L.C., Hiver, A., van Zessen, R. and Lüscher, C. (2022). Dual action of ketamine confines addiction liability. Nature, 608(7922), 368-373.*

[12] *Cheron, J. and Kerchove d'Exaerde, A.D. (2021). Drug addiction: from bench to bedside. Translational Psychiatry, 11(1), 424.*

[13] *Makino, H. and Malinow, R. (2009). AMPA receptor incorporation into synapses during LTP: the role of lateral movement and exocytosis. Neuron, 64(3), 381-390.*

[14] *Bouarab, C., Thompson, B. and Polter, A.M. (2019). VTA GABA neurons at the interface of stress and reward. Frontiers in neural circuits, 13, 78.*

DOI: 10.54254/2753-7064/40/20242277

[15] *Liu, Q.S., Pu, L. and Poo, M.M. (2005). Repeated cocaine exposure in vivo facilitates LTP induction in midbrain dopamine neurons. Nature, 437(7061), 1027-1031.*

[16] *Chiu, C.Q. and Castillo, P.E. (2010). Endocannabinoid Mediated Long-Term Depression at Inhibitory Synapses. In Inhibitory Synaptic Plasticity (pp. 149-166). New York, NY: Springer New York.*

[17] *Ostroumov, A., Wittenberg, R.E., Kimmey, B.A., Taormina, M.B., Holden, W.M., McHugh, A.T. and Dani, J.A. (2020). Acute nicotine exposure alters ventral tegmental area inhibitory transmission and promotes diazepam consumption. Eneuro, 7(2).*

[18] *Vaquer-Alicea, A.D.C., Vázquez-Torres, R., Devarie-Hornedo, M., Vicenty-Padilla, J.C., Santos-Vera, B., María-Ríos, C. and Jiménez-Rivera, C.A. (2018). aPKC-mediated persistent increase in AMPA/NMDA ratio in the VTA participates in the neuroadaptive signal necessary to induce NAc synaptic plasticity after cocaine administration. Neuroscience, 392, 129-140.*

[19] *Wright, W.J. and Dong, Y. (2021). Silent synapses in cocaine-associated memory and beyond. Journal of Neuroscience, 41(45), 9275-9285.*

[20] *Lalchandani, R.R., van der Goes, M.S., Partridge, J.G. and Vicini, S. (2013). Dopamine D2 receptors regulate collateral inhibition between striatal medium spiny neurons. Journal of Neuroscience, 33(35), 14075-14086.*

[21] *Xiao, X., Deng, H., Furlan, A., Yang, T., Zhang, X., Hwang, G.R. and Li, B. (2020). A genetically defined compartmentalized striatal direct pathway for negative reinforcement. Cell, 183(1), 211-227.*

[22] *Stephenson-Jones, M., Yu, K., Ahrens, S., Tucciarone, J.M., van Huijstee, A.N., Mejia, L.A. and Li, B. (2016). A basal ganglia circuit for evaluating action outcomes. Nature, 539(7628), 289-293.*

[23] *Wang, W., Xie, X., Zhuang, X., Huang, Y., Tan, T., Gangal, H. and Wang, J. (2023). Striatal μ-opioid receptor activation triggers direct-pathway GABAergic plasticity and induces negative affect. Cell reports, 42(2).*

[24] *McDevitt, D.S., Jonik, B., and Graziane, N.M. (2019). Morphine differentially alters the synaptic and intrinsic properties of D1R-and D2R-expressing medium spiny neurons in the nucleus accumbens. Frontiers in Synaptic Neuroscience, 11, 35.*

[25] *Giannotti, G., Gong, S., Fayette, N., Heinsbroek, J.A., Orfila, J.E., Herson, P.S. and Peters, J. (2021). Extinction blunts paraventricular thalamic contributions to heroin relapse. Cell reports, 36(8).*

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242300

The Benefits of Incorporating Phonology and Morphology in English Education

Zongxuan Yu[1,a,*]

[1]*University of Washington, Seattle, 98105, USA*
a. zongxuany@icloud.com
**corresponding author*

Abstract: English teaching methods have undergone significant changes and improvements over the past four decades. However, teachers continue to encounter challenges when delivering lectures in the classroom. While numerous teaching approaches have been proposed, there has been limited focus on the areas of phonology and morphology. Nonetheless, phonology and morphology have demonstrated their effectiveness in teaching English as a second language. Integrating these linguistic elements into the teaching process can greatly enhance its efficiency and provide inspiration to new learners. The paper analyzes how these two fundamental linguistic components can be effectively integrated into our current English teaching model. Based on the studies completed by former researchers, the results indicate that they can serve as valuable tools and crucial building blocks for both teachers and students alike. This paper may help envision a future where the current English teaching model is reshaped, and teaching becomes more efficient, inspiring a new generation of English learners.

Keywords: English teaching methods, phonology and morphology, linguistic components.

1. Introduction

English, as an international language, has been learned and studied by many people and distinct cultures around the world. However, issues with teaching methods have also come to the surface. What is an effective way of teaching English as a second language? Some scholars have brought up various approaches throughout the past 40 years. Among all those means and techniques, incorporating phonology and morphology while teaching English has become one of the most effective and efficient ways for new learners to acquire the language. In this paper, some of the methods from other previous studies on phonology and morphology are discussed and utilized in order to show the importance and benefits brought by these two key elements. By incorporating phonology and morphology in general English teaching, with the results of these studies, people can envision a future where the current English teaching model is reshaped, and teaching becomes more efficient, inspiring a new generation of English learners.

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242300

2. Background Information

2.1. The Issues in the Current Model

Jenkins [1] wrote in her book that “the majority of EFL teacher training and education courses, both preservice and inservice, persist with phonology syllabuses that assume a ‘native-speaker’ interlocutor. They therefore involve elements that are unnecessary, unrealistic, and, at worst, harmful for preparing teachers to equip their learners with pronunciation skills appropriate to an international use of English.”

In the current English education model across many countries in the world, the role of language structure is less significant or evident as part of the lesson plans. The usual pattern would be the teacher demonstrating the pronunciation and some so-called "fitted use of grammar” while the students follow along, which is tedious and thus makes it slow for any person to acquire a new language. Under such a model, the students' future English ability highly depends on their teachers' abilities, and they would not be motivated and comprehensive enough to learn some higher level of English. Therefore, this could lead to a vicious cycle where the students are repulsively forced to learn English as their second language. They have to acquire the ability to speak and write the language tediously and exhaustively; plodding progress will absolutely crush their confidence and thus make them more repulsive in learning English. Eventually, only very few students could make a way out of the cycle and actually become able to utilize the language, leaving out the rest of the majority who constantly question themselves for the usage of their effort and even the usefulness of the language.

As Hamka [2] has eloquently stated in his work, languages are similar to our society. We, as humanity, are a species that were created to live in a group. With the assistance and accomplishments of other people, this study scaffolds the pride and prosperous cultures around the world. When talking about a specific culture, people will never think of one single person or incident, but everything that has occurred and accomplished in the past — the historical figures, the architecture, the traditions, and so many more. The same applies to languages; in the field of linguistics, a language can be broadly divided into phonetics, phonology, morphology, syntax, semantics, and pragmatics. Each of these individual aspects can only provide a tiny grasp of the language. In order to see the full image, it is necessary to incorporate all of them together.

However, the current model only briefly touches upon phonetics and syntax, which correspond to pronunciation and grammar. Solely memorizing the pronunciation and being forced to stare at the words repetitively in order to remember them without knowing the theories and patterns behind them will only bring frustration and prevent the students from moving forward. Therefore, there is an urge for change in our current English education model.

2.2. The Importance of Incorporating Phonology and Morphology

As mentioned previously, the urgency of introducing phonology and morphology to English teaching is at hand. Therefore, the importance of these two English essentials should also be seen and acknowledged.

Firstly, making phonology part of English learning can help the students understand the sound system of English and assist them in producing sounds correctly. Knowing how morphemes, which are the smallest units of meaning in a language, interact and change sounds in different contexts, such as plural endings and verb conjugations, helps more inaccurate pronunciation. Thus, learning phonology and morphology can help improve pronunciation significantly.

Secondly, they can help facilitate the vocabulary development of the students. Learning with morphology can help the students understand how prefixes, suffixes, and root words combine, which

DOI: 10.54254/2753-7064/40/20242300

can expand vocabulary more efficiently and aid in guessing the meanings of new words. After familiarizing themselves with the phonology, the students can also memorize and recall words by associating sounds with meaning, which will build a more robust vocabulary effectively.

And thirdly, these can aid the students further in their grammar acquisition. Grammatical distinctions often depend on correct pronunciation, such as the difference between "teach" and “taught”. Also, understanding how morphemes change according to grammatical rules helps in forming grammatically correct sentences.

In summary, there are many benefits that students can receive from learning English with the assistance of phonology and morphology. Thus, it is now clear that these are some of the most critical factors for elementary English teaching.

3. Effective English Teaching Methods

Before teaching English phonology, there is one thing that is also essential and worthwhile for the students to learn, and is that there are many different and distinctive dialects in English. English is spoken in a global region by various people with other tongues. Even among the native speakers of English, there are diverse varieties, such as American English and British English. And within these broad varieties, there are also many subcategories. For instance, within North American English spoken in the United States, the dialect regions can be generally divided into six geographic factors—North, Midland, South, West, New England, and Appalachia (Figure 1).



Figure 1: U.S. Dialect Map [3].

After learning the fact that people speak differently in each dialect region, students should also know the major factors that cause language variation within speech communities. As argued by Curzan and Adams [4], "the speakers’ age, gender, socioeconomic class, race, ethnicity, and social networks can all have an effect on how people speak.”

With all the efforts introducing the variety of the English language, it addresses one big common problem in many societies, that is, many people are ashamed of their English accent. People are scared of speaking English because they don't want to be laughed at for their pronunciation, which sounds different, and they would feel awkward. As a result, they don't have the opportunity to practice pronunciation and use the language. Over time, they will become unwilling to speak. The problem is caused by people judging each other and their discrimination, which starts with a lack of understanding of the language. Therefore, people need to know that there are varieties within every

DOI: 10.54254/2753-7064/40/20242300

language, and there is nothing to be ashamed of for their different pronunciations. Giving new learners the confidence to say and practice will be a solid foundation to start the journey of English teaching.

3.1. Phonological Teaching

The very first thing for the students to acquire before the entire systematic phonology teaching is the IPA symbols (Figure 2), the symbols invented to mark the phonological values of every language around the world spoken by human beings. Without the IPAs, the task of teaching English will only become more complicated and more burdensome for both students and teachers because the teachers will have to explain every individual pronunciation for every single word.
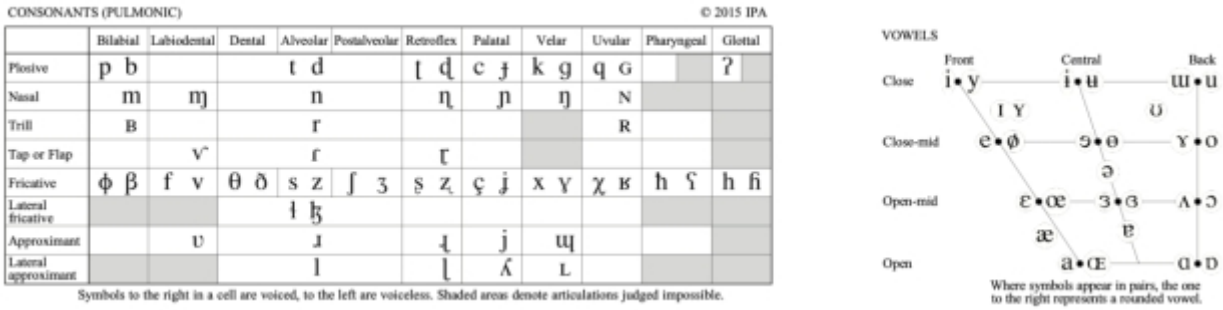


Figure 2: International Phonetic Alphabet [5].

As one of the pioneers in this field, Pennington [6] researched in her book that phonology has several single differences in lexical meaning, grammatical meaning, and utterance meaning. A minimal pair of *pan* and *ban* shows that a change in the consonant can result in a meaning change. The contrast between the present tense *read* /ɹiːd/ and the past tense *read* /ɹɛd/ marks the phonological difference in grammatical meaning. And lastly, the utterance difference can be marked by the intonation of English. An example would be, provided by Pennington, *He left*, as the final intonation goes down, compared to *He left?*, where the final intonation goes up. In these two sentences, the phonological differences indicate whether the sentence is a statement or an analysis.

One practical application to teach phonology is to put words with similar pronunciations together and form a list for the students to read along. For example, words like *cat, bat, rat, mat,* etc., can be on one single list, and the teacher can ask the students to pronounce these words. In this way, students can learn and recognize the phonological values along with the patterns between the vowel [æ] and the final consonant [t].

With the useful phonological information in mind, the teaching will become more intuitive and more straightforward. This was also proven in a study completed by Yeung, Siegel, and Chan [7], where they experimented on the effects of phonological awareness on ESL children. Their findings from this valuable study illustrate that the students who were under training in phonological awareness performed significantly better in oral language proficiency, word reading and spelling, and letter knowledge than the control group, which was the one without phonological awareness practice.

Therefore, it is obvious to see the positive effects of phonological awareness in English language education that can bring to the students in their L2 (Second Language) acquiring process, not only in their pronunciation accuracy but also in their reading and spelling ability.

3.2. Morphological Teaching

As stated by McCarthy [8], no matter how well this student learns grammar, no matter how successfully the sounds of L2 are mastered, without words to express a wider range of meanings, communication in an L2 just cannot happen in any meaningful way. It is shown that words are the

DOI: 10.54254/2753-7064/40/20242300

fundamental elements of a language. Thus, the students need to master the words before mastering the language, which is through morphology teaching.

In morphology, new words are usually formed in the following major ways:

- Derivation: a new word is formed from an existing word. For example, *investigation* and *investigator* are derived from the verb *(to) investigate.*
- Compounding: a new word is formed by combining two words. An example would be *laptop,* which is formed by combining *lap* and *top*.
- Blending: a new word is formed by combining two words in both sound and meaning, which is different from compounding since blending also includes sound changes. For instance, *motor* and *hotel* become *motel*, and *breakfast* and *lunch* become *brunch.*
- Acronyms: a new word is formed from the initial letters of several words. For example, *NASA* is an acronym of *National Aeronautics and Space Administration*.

After knowing how English words are generally formed, students will have an easier time identifying those segments in their vocabulary. Only by mastering the knowledge of word formation and lexemes can we expand our vocabulary quickly, better understand and express our thoughts and feelings, and improve our language application skills [9].

The most significant and beneficial way of implementing morphology in English teaching is to help the students recognize that in English, and similar to other European languages, words are composed by combining different morphemes. Instead of memorizing those long and complicated words by repeating their letters, knowing how they are formed by identifying their morphemes is undoubtedly the most efficient way and, indeed, the only way for native speakers. However, such a way may not be apparent for ESL learners. And thus, it will eventually prevent students from expanding their vocabulary.

Similar to Chinese language teachers, rather than diving straight into lecturing on how to write different Chinese characters, the teachers will start by showing how the characters are formed with a combination of radicals. The same idea should also be applied to English teachers.

One of the numerous practical teaching ways is that English teachers should begin their lectures by introducing and explaining English morphemes as a cornerstone of the language. For instance, English words contain roots, prefixes, and suffixes. Among these big categories, each of them includes many morphemes, such as *re-, in-, un-* as prefixes, and *-able, -tion, -ment* as suffixes. A combination of these three categories, an English word is composed. Transportation, for example, consists of the prefix *trans-*, which stands for "across," the root *port,* meaning "to carry," and the suffix *-ation,* representing "the action of (a verb)" or "the result of (a verb)." Therefore, the word *transportation* means "the action of taking or carrying (people or goods) from one place to another".

In sum, more and more people in the field of English education have realized and recognized the significance of morphology. By utilizing various creative teaching methods, it would only be more beneficial and efficient for the students' English journey, which is also suggested by another researcher, Yajie Jiang, in order to learn English well, you must master the knowledge of word formation. To acquire English vocabulary comprehensively and in-depth, we must rely on scientific theories and methods [10].

4. Conclusion

The core part of this paper is to provide an analysis of the significance of incorporating phonology and morphology into our current English education model that the school uses. The paper first introduces the issues in our current English education model for ESL students and the reasons why people should learn English or any other language in a systematic way. Then, the effective ways and evidence of incorporating phonology and morphology in our English education are discussed in detail,

DOI: 10.54254/2753-7064/40/20242300

which started by showing the importance for the students to realize the variety in people's accents. The paper also refers to some prior studies and experiments, in which the results of these studies showed that the students who were trained in phonology and morphology performed significantly better than those who were not, to prove that including these new factors can practically improve students' English level and proficiency. There are still a few things that could be improved in this paper, such as insufficient citation of articles due to the lack of awareness of the significance in this area. Thus, there needs to be more valuable research on the topic to attract other people's, especially the educators', attention so that more scientific research can be completed and language education can be improved. As a result, future studies can focus on coming up with more phonology and morphology teaching methods that can be utilized in practical teaching environments and the actual experiments that use phonology and morphology as the main emphasis of an English teaching model and gather data that directly reflect the results.

References

[1] *Jenkins, J. (2000). The phonology of English as an international language: New models, new methods, new results. Oxford University Press.*

[2] *Hamka, H. (2016). Phonetics and phonology in teaching English as the theory of language production. Proceedings of ISELT FBS Universitas Negeri Padang, 4(1), 348-362.*

[3] *Department of Linguistics, (2016). Language Files: Materials for an Introduction to Language and Linguistics, 12th Edition. Ohio State University Press.*

[4] *Curzan, A., Adams, M. (2012). How English works: A linguistic introduction (3rd ed.). Pearson.*

[5] *International Phonetic Association. (2015). Full IPA Chart. https://www.internationalphoneticassociation.org/content/full-ipa-chart#ipachartkiel*

[6] *Pennington, M. C. (1996). Phonology in English language teaching : an international approach. Longman.*

[7] *Yeung, S.S.S., Siegel, L.S., Chan, C.K.K. (2013). Effects of a phonological awareness program on English reading and spelling among Hong Kong Chinese ESL children. Read Writ 26, 681–704.*

[8] *McCarthy, M. J. (1990). Vocabulary. Oxford University Press.*

[9] *Wang, S., Wang, N. (2013) Application of morphology in college English teaching. Journal of Shijiazhuang Vocational Technology Institute, Vol.25, No.4.*

[10] *Yajie Jiang. (2020). The Role of Morphology in English Vocabulary Teaching. Learning & Education. 9. 120. 10.18282/l-e.v9i2.1422.*

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242334

The Effectiveness of Ketamine Treatment on Depression

Yichen Liu[1,a,*]

[1]*Shanghai Pinghe Bilingual School, Shanghai, China*
a. liuyichen@shphschool.com
**corresponding author*

Abstract: As the diagnosis rate of depression continues to rise, effective treatment options for this condition have become one of the most researched areas in the field. Earlier antidepressants were primarily developed based on mechanisms that involve regulating imbalanced neurotransmitters. For example, the widely known Selective Serotonin Reuptake Inhibitors (SSRIs) and various tricyclic antidepressants work by adjusting the concentration of different neurotransmitters, such as dopamine and norepinephrine, in the synaptic cleft to alleviate depressive symptoms. Additionally, many therapeutic approaches have been developed and applied based on the widely accepted hormone hypothesis and neurotrophic factor hypothesis. Ketamine, a drug traditionally used as an anesthetic, has recently been discovered to possess antidepressant properties. Its efficacy and underlying neuroscientific mechanisms are currently under investigation. Unlike earlier antidepressants, Ketamine produces significant antidepressant effects within a short time after administration. Multiple studies have suggested that Ketamine's rapid and effective therapeutic results may be based on entirely new antidepressant mechanisms and targets that have yet to be fully understood. This provides a new solution for the treatment of treatment-resistant depression and offers new hope to patients who have tried various treatments without success. In this literature review, Ketamine's therapeutic effects and its underlying mechanisms will be thoroughly examined. The content will be divided into three sections: significant antidepressant effects, underlying principles and mechanisms, and factors relevant to the improvement of Ketamine therapy.

Keywords: depression, Ketamine, treatment resistance.

1. Introduction

Depression is a common mental health disorder that can lead to significant personal distress and impairment of social functioning, with symptoms typically lasting for at least two weeks for each episode. The primary symptoms of depression include persistent negative emotions, sleep disturbances, changes in appetite, difficulty concentrating, and social interaction issues. These symptoms can affect all aspects of a person's life, including mental and physical health and social behavior. In severe cases, if left untreated, individuals may develop thoughts of suicide or suicidal attempts. According to the World Health Organization, more than 280 million people worldwide are affected by depression, accounting for 3.8% of the global population (WHO, 2023). It is estimated that by 2030, depression could become the second leading cause of disease burden globally. These statistics indicate that depression has become one of the most prevalent mental health disorders.

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242334

Currently, the monoamine hypothesis remains one of the most widely accepted explanations for the pathophysiology of depression. This hypothesis suggests that dysfunction in monoamine neurotransmitters, such as dopamine, serotonin, and norepinephrine, is a primary cause of depressive symptoms. In a depressive state, the concentration of these monoamines in the synaptic cleft is reduced [1]. Many commonly used antidepressants are based on the monoamine hypothesis. For example, early tricyclic antidepressants like imipramine work by inhibiting the reuptake of serotonin and norepinephrine in the synaptic cleft, thereby increasing the concentration of these neurotransmitters. Selective serotonin reuptake inhibitors (SSRIs), such as fluoxetine, also operate on this principle [2]. In addition to the monoamine hypothesis, the overactivation of the hypothalamic-pituitary-adrenal (HPA) axis and the associated stress response is another major factor in the onset of depression. Under normal circumstances, the release of glucocorticoids following HPA axis activation helps enhance hippocampal function. However, in cases of chronic severe stress, sustained high levels of glucocorticoids can exert neurotoxic effects and damage hippocampal neurons, impairing important cognitive functions. Chronic stress can also reduce the levels of brain-derived neurotrophic factor (BDNF) in the hippocampus, negatively affecting neurogenesis (the formation of new neurons) and neural plasticity [3]. Furthermore, recent studies have shown that glutamate ion channel-dependent burst firing in the lateral habenula is a significant cause of anhedonia and behavioral despair. The frequent firing of the lateral habenula enhances the inhibition of dopaminergic neurons, preventing individuals from experiencing pleasure [4].

Although the current common antidepressants can relieve depression in most patients with mild symptoms, there are still exceptions. Treatment Resistance Depression (TRD) usually refers to insufficient response to at least one adequate dose and course of antidepressant trial. Up to 10%-20% of patients with depression are suffering from TRD [5]. In recent years, research on the treatment of TRD has been increasing, and Ketamine, an emerging drug, has performed well in it. Ketamine is a fast-acting antidepressant that was originally developed as an anesthetic, it is unique compared to traditional antidepressants, such as SSRIs and TCAs, in that it eases depressive symptoms within hours rather than weeks. Most patients who have not responded to monoamine antidepressants have made considerable progress after receiving Ketamine therapy. This not only support that the antidepressant effect of Ketamine comes from a new mechanism, but also brings new hope for the treatment of refractory depression. Due to ketamine's significant efficacy and achievements in treating depression, this paper will explore the drug in depth. The discussion will cover its positive therapeutic effects on depression, the underlying neural mechanisms, and factors that could further enhance its effectiveness.

2. The Positive Impact of Ketamine on Depression

2.1. Overall Effectiveness of Ketamine on Depression

Since Ketamine emerged as a novel antidepressant in the treatment of depression, numerous studies and trials have been conducted to evaluate its efficacy. The majority of these studies have demonstrated that Ketamine is indeed effective in treating depression. Mandal and colleagues evaluated the efficacy of Ketamine treatment on depression in 2019. There are 25 drug-free male participants who are diagnosed with depression involved in this experiment. The baseline assessment (i.e., Hamilton Depression Scale, a standard scale for depression diagnosed) is given before they receive any treatment. Their scores are all above 16 which suggests that their depression is severe. After that, they received six Ketamine administrations within 2 weeks, the researcher let them do the assessment one hour after the administration every time. After the final administration, they did the last assessment. Their scores suggest that after 2 weeks Ketamine therapy, their symptoms diminish and relieve a lot. This effect sustained for at least one month [6]. Not only has this research confirmed

DOI: 10.54254/2753-7064/40/20242334

Ketamine's significant impact on alleviating depressive symptoms, but it also highlighted the lasting effects of the treatment, which continue for a considerable period after the treatment ends. This is particularly beneficial for patients who require long-term therapy. Moreover, all participants in the study had not taken any form of medication or received any treatment prior to the experiment, ensuring that the therapeutic effects observed were solely due to Ketamine, free from any confounding effects of other treatments.

What truly sets Ketamine apart and has made it one of the most anticipated new antidepressants is its effectiveness in treating not only typical depression but also treatment-resistant depression (i.e., patients with major depressive disorder who had not responded to at least two adequate trials of antidepressants are diagnosed with the TRD). In the study by Phillips and colleagues, they investigated the efficacy of Ketamine for patients with TRD who experience suicidal ideation by using a randomized, double-blind, placebo-controlled design. The suicidal ideation was measured by Montgomery–Åsberg Depression Rating Scale (i.e., a clinically used depression scale with good sensitivity to changes during treatment of depression) and the Quick Inventory of Depressive Symptomatology Self-Report 16-item version. (The score ranges from 0 to 27, with higher scores indicating more severe depression). Participants (i.e., individuals with TRD and have active suicidal ideation) will either receive multiple Ketamine infusions or placebo infusions, administered thrice weekly over 2 weeks. Those who developed an antidepressant response also received an additional four weeks of weekly injections. After treatment, their suicidal ideation was measured in several time points to test both the immediate and sustained effects. As a result, Ketamine showed rapid reduction in suicidal ideation compared to placebo with significant improvements noted as early as 24 hours post-infusion [7]. Overall, 69 percent of participants experienced complete remission of SI after repeated infusions (i.e., shown by the comparison between the baseline scores and the after treatment scores of two standard scales). This suggests that it is effective to use Ketamine as a short term treatment for those patients who are diagnosed with TRD. The rapid onset of Ketamine's effects is crucial for patients with severe depression who are at constant risk of suicide. Unlike traditional antidepressants, such as SSRIs, which require a gradual and prolonged treatment period to become effective, Ketamine offers immediate relief, swiftly eliminating suicidal thoughts. This immediacy makes Ketamine an irreplaceable option in antidepressant therapy.

Furthermore, Ketamine stands out even when compared to other common treatments for treatment-resistant depression. Mathew and colleagues compared the efficiency of the Ketamine treatment and the Electroconvulsive therapy (ECT) (i.e., Stimulating the brain with a brief electrical current, regulating brain chemicals and alleviating severe depressive symptoms) on depression by using an open label, randomized, noninferiority trial conducted across five clinical centers. The purpose of such trials is to determine whether a new treatment is at least as good as existing standard treatment, in this case, the Electroconvulsive therapy. In the experiment, participants received either Ketamine administration or Electroconvulsive therapy within three weeks. The result shows that the Response rates (i.e., QIDS-SR-16)) score decreased by 55.4% for Ketamine and 41.2% for ECT after 3 weeks treatment, suggesting that the Ketamine treatment is noninferior than the ECT [8]. At the same time, Ketamine administration shows relatively mild side effects (e.g. disassociation), which diminished within a short time period. This study show that its efficacy is comparable to traditional methods like ECT, while its side effects are significantly milder and less distressing for patients. In short, Ketamine has consistently proven its remarkable therapeutic benefits in numerous studies. Its rapid action and minimal side effects have distinguished it as one of the most promising and eagerly awaited antidepressants available.

DOI: 10.54254/2753-7064/40/20242334

2.2. Neural Mechanism Underlying the Effectiveness of Ketamine

To investigate why Ketamine is so effective and works so quickly, scientists have conducted numerous experiments in recent years to explore its unique mechanisms. The study carried out by Fuchikami et al. investigated how activating specific neurons in the infralimbic prefrontal cortex (IL-PFC) can mimic the rapid and long-lasting antidepressant effects of Ketamine. In the experiment, researchers used the Optogenetic Activation (i.e., using light-sensitive proteins to control neuronal activity with light.)to specifically activate the target neurons in some rodents (Adult male Sprague-Dawley rats (from Charles River Laboratory), weighing 150-250 g, were kept in pairs during a 12-hour light/dark cycle (with lights on at 07:00) with free access to food and water. All indicators are normal). The result shows that the activation can promote significant antidepressant and anxiolytic behaviors (i.e., antianxiety) in rodents [9]. After comparison, they found that the effect of the activation is very similar to what is observed after the Ketamine administration (i.e., rapid and sustained antidepressant effects), suggesting that the antidepressant mechanism of the Ketamine treatment could be the modulation of neuronal activity in the IL-PFC. Although the researchers reached this conclusion, the experiment provided no direct evidence linking IL-PEC and Ketamine's mechanism of action. The observed similarity was merely noted, without establishing a substantial connection.

However, another experiment identified changes in specific brain region activity following Ketamine injection, pinpointing one of the potential targets of Ketamine's mechanism of treatment. Yang et al. investigated how Ketamine exerts its rapid antidepressant effects. The primary focus of the research is on the lateral habenula (LHb), a brain region implicated in depression. The researcher first found that the activation of neurons in the lateral habenula by optogenetic technique led to significantly depressive-like behaviors in animal models (i.e., despair and anhedonia). Increased burst activity and theta-band synchronization in LHb neurons are also observed in those depressive-like animals. This suggests that the activity of LHb is highly related to depression. After that, they administered Ketamine specifically into the LHb of some animals who present depressive behaviors. The data of the Electrophysiological Recordings shows that Ketamine rapidly reverses the increased burst activity in the LHb [4]. With this result, the researchers proposed a model that Ketamine's inhibition of NMDAR-dependent can burst in the LHb, disinhibits midbrain dopaminergic and serotoninergic neurons, which are crucial for activating brain reward centers in order to reach the antidepressant effects. This study was not only found that Ketamine's rapid and effective antidepressant effects are related to its role as an NMDA receptor antagonist, but also was the first paper to demonstrate the interaction between Ketamine and the anti-reward center, the LHb. The result brings significant advancements to the research on Ketamine's antidepressant mechanisms, which had previously been largely speculative.

Additionally, potential mechanisms explaining Ketamine's relatively long-lasting antidepressant effects have also been explored. The study carried out by R. N. Moda-Sava and colleagues investigated how antidepressants, particularly Ketamine, induce dendritic spine (i.e., important sites of synaptic transmission in neurons, acting as the key factors in nerve signal transmission and neuroplasticity) formation in the medial prefrontal cortex (mPFC) to alleviate depression. By using the longitudinal imaging and the animal model, the researcher found out that Depression-related behavior in mice is associated with the elimination of dendritic spines in the mPFC. The administration of Ketamine can partly repaired these dendritic spines loss and promote related multicellular ensemble activity in neurons projected to the PFC. The immediate effects of Ketamine on those neural activities are the reason why the treatment can rapidly reverse the depressed symptoms. At the same time, the spinogenesis (i.e., the new formation of dendritic spines) is very essential for the long-term maintenance [10]. Before Ketamine was used as an antidepressant, the

DOI: 10.54254/2753-7064/40/20242334

dendritic spines damaged by depression could not be repaired, leading to prolonged negative impacts on corresponding neural activity. Ketamine's promotion of spinogenesis suggests that the neural damage caused by depression can be reversed, with the newly formed dendritic spines being maintained over the long term. This lasting effect is something other medications cannot achieve.

Despite these significant advances in understanding Ketamine's mechanisms, all these studies share a common limitation: they were conducted on animal models. Currently, there are very few human studies exploring Ketamine's mechanisms. Therefore, although the neural mechanisms observed in animals are somewhat similar to those in humans, more human studies will likely be needed in the future to further support Ketamine's actual mechanism of action.

3. Factors Relevant to the Improvement of Ketamine Therapy

Although numerous studies have confirmed that Ketamine is highly effective in treating depression, the method of administration and dosage can significantly influence its efficacy. To optimize treatment, scientists have conducted various experiments. In the study by Loo et al., the efficacy and safety of repeated subcutaneous Ketamine injections in patients with TRD was assessed using randomized, double-blind experiment. There are two cohorts involved in this experiment, fixed-dose cohort and flexible-dose cohort (i.e., whether the amount of medicine can be adjusted based on the situation). Ketamine or midazolam (placebo) were injected subcutaneously twice a week for 4 weeks. The data was collected 3-4 days after the final treatment. The result shows that in the flexible-dose cohort, patients that are treat with Ketamine have a higher remission rate (i.e., measure by the Montgomery–Åsberg Depression Rating Scale) [11]. The side effects of Ketamine can be resolved within two hours of administration , which also suggests that Ketamine is safe and well-tolerated. This experiment showed that when a fixed-dose injection method was used, the effects of Ketamine were almost identical to those of a placebo. This finding suggests that for Ketamine therapy to be effective, patients must receive a dosage tailored to their individual condition to ensure the best therapeutic outcome.

Another study indicated that, in addition to using Ketamine after depressive symptoms appear, administering Ketamine preemptively could effectively prevent a range of depressive symptoms triggered by anxiety. A study carried out by Rebecca et al. investigated the effect of Prophylactic administration (i.e., the use of a treatment or intervention to prevent the onset of a disease or condition before it occurs) of Ketamine on some Stress-Induced Depressive-Like Behavior by using animal model. Some wild type mice received the administration of either Ketamine or saline water (placebo). After one week, they were all put into some stress model and their behaviors were observed. The study used various stress models to simulate psychiatric conditions, such as SD (i.e., exerting stress by letting those mice experience social failure), forced swim test and the dominant interaction test. The result shows that a single low-dose injection of Ketamine can protect against stress-induced depressive behavior in mice [12]. This is effective for at least four weeks. This suggests the potential for using Ketamine as a preventive treatment for stress-related psychiatric disorders in humans. While the experiment demonstrated the feasibility of this approach, preventive Ketamine injections have not yet been widely adopted. More studies need to be carried out to validate this method and facilitate its clinical application. Another feature of Ketamine is that it has high response and remission rates, and it only takes 4 to 72 hours to produce an effect for one dose [13]. One of the major drawbacks of other monoamine drugs or tricyclic drugs is that they take a very long time to take effect. The most common SSRI takes about two weeks to take effect, during which time the patient's existing anxiety and suicidal thoughts are likely to intensify [14]. Therefore, the fast onset of Ketamine is very unique and important.

DOI: 10.54254/2753-7064/40/20242334

4. Conclusion

Numerous studies have demonstrated that Ketamine is a fast-acting and effective novel antidepressant. Its efficacy extends beyond common forms of depression to treatment-resistant depression, where it has shown positive results even when other treatments have failed. Compared to traditional methods used to treat treatment-resistant depression, Ketamine is well-tolerated, with relatively mild side effects that usually subside shortly after discontinuation. According to multiple studies, Ketamine's antidepressant mechanism may be linked to its role as an NMDA receptor antagonist. By inhibiting NMDA receptor-mediated neurotransmission, Ketamine reduces burst firing in the LHb, thereby mitigating the LHb's negative regulatory effect on emotion and reward processing. Additionally, Ketamine's ability to promote dendritic spine regeneration in certain brain regions contributes to its longer-lasting antidepressant effects. It is worth noting that both of the potential antidepressant mechanisms of ketamine mentioned above were discovered in animal model experiments. Whether these mechanisms can be fully applied to humans remains to be determined.

As previously mentioned, most studies on the antidepressant mechanisms of Ketamine have been carried out using animal models. While this approach holds significant value in scientific research, it also comes with several limitations. Firstly, there are considerable interspecies differences between animals and humans, such as in physiology, genetics, and metabolism. Even though some physiological functions may be similar between animals and humans, the resulting physiological responses can differ significantly. This disparity can lead to differences in how experimental results translate from animals to humans. Moreover, humans have complex behaviors and physiological processes influenced by social, cultural, educational, and emotional factors. These factors are difficult to replicate in animal models. This is especially true for mental disorders like depression, where emotions and external social factors play a substantial role in the onset and progression of the disease. Therefore, results derived from animal models may not fully reflect real-world situations. Secondly, the environment in which animal model experiments are conducted is artificial and differs significantly from the natural environments in which humans live. The laboratory conditions may cause animals to exhibit behaviors that do not align with their natural state, potentially affecting the final experimental outcomes. Thus, more research based on human subjects should be carried out to avoid these potential limitations and increase the likelihood that experimental theories can be applied in real life.

Although significant progress has been made in research on the antidepressant effects of Ketamine, there are still many areas that require further exploration and development. Studies have shown that there are very few experiments investigating the long-term safety of Ketamine use. While Ketamine has shown excellent short-term efficacy, people still need to consider whether long-term use could lead to drug tolerance, increased side effects, or adverse effects on cognitive function and physical health. Additionally, Ketamine's effectiveness may vary among individuals, so future research could focus on developing personalized treatment plans. For example, genetic testing or neuroimaging techniques could be used to predict which patients are most likely to respond positively to Ketamine treatment, thereby optimizing dosage and treatment protocols. Some patients may not be well-suited to the most common method of Ketamine administration, intravenous injection, so exploring more varied and convenient delivery methods is also a potential future research direction.

References

[1] *Boku, S., Nakagawa, S., Toda, H. and Hishimoto, A. (2017). Neural basis of major depressive disorder: Beyond monoamine hypothesis. Psychiatry and Clinical Neurosciences, 72(1), 3–12.*

[2] *Hirschfeld, R.M. (2000). History and evolution of the monoamine hypothesis of depression. Journal of clinical psychiatry, 61(6), 4-6.*

DOI: 10.54254/2753-7064/40/20242334

[3] *Nestler, E.J., Barrot, M., DiLeone, R.J., Eisch, A.J., Gold, S.J. and Monteggia, L.M. (2002). Neurobiology of depression. Neuron, 34(1), 13-25.*

[4] *Yang, Y., Cui, Y., Sang, K., Dong, Y., Ni, Z., Ma, S. and Hu, H. (2018). Ketamine blocks bursting in the lateral habenula to rapidly relieve depression. Nature, 554(7692), 317-322.*

[5] *Serafini, G., Howland, R., Rovedi, F., Girardi, P. and Amore, M. (2014). The role of Ketamine in treatment-resistant depression: a systematic review. Current neuropharmacology, 12(5), 444-461.*

[6] *Mandal, S., Sinha, V.K. and Goyal, N. (2019). Efficacy of Ketamine therapy in the treatment of depression. Indian journal of psychiatry, 61(5), 480-485.*

[7] *Phillips, J.L., Norris, S., Talbot, J., Hatchard, T., Ortiz, A., Birmingham, M. and Blier, P. (2020). Single and repeated Ketamine infusions for reduction of suicidal ideation in treatment-resistant depression. Neuropsychopharmacology, 45(4), 606-612.*

[8] *Anand, A., Mathew, S.J., Sanacora, G., Murrough, J.W., Goes, F.S., Altinay, M. and Hu, B. (2023). Ketamine versus ECT for nonpsychotic treatment-resistant major depression. New England Journal of Medicine, 388(25), 2315-2325.*

[9] *Fuchikami, M., Thomas, A., Liu, R., Wohleb, E.S., Land, B.B., DiLeone, R.J. and Duman, R.S. (2015). Optogenetic stimulation of infralimbic PFC reproduces Ketamine's rapid and sustained antidepressant actions. Proceedings of the National Academy of Sciences, 112(26), 8106-8111.*

[10] *Moda-Sava, R.N., Murdock, M.H., Parekh, P.K., Fetcho, R.N., Huang, B.S., Huynh, T.N. and Liston, C. (2019). Sustained rescue of prefrontal circuit dysfunction by antidepressant-induced spine formation. Science, 364(6436), eaat8078.*

[11] *Loo, C., Glozier, N., Barton, D., Baune, B.T., Mills, N.T., Fitzgerald, P. and Rodgers, A. (2023). Efficacy and safety of a 4-week course of repeated subcutaneous Ketamine injections for treatment-resistant depression (KADS study): randomised double-blind active-controlled trial. The British Journal of Psychiatry, 223(6), 533-541.*

[12] *Brachman, R.A., McGowan, J.C., Perusini, J.N., Lim, S.C., Pham, T.H., Faye, C. and Denny, C.A. (2016). Ketamine as a prophylactic against stress-induced depressive-like behavior. Biological psychiatry, 79(9), 776-786.*

[13] *Katalinic, N., Lai, R., Somogyi, A., Mitchell, P.B., Glue, P. and Loo, C.K. (2013). Ketamine as a new treatment for depression: a review of its efficacy and adverse effects. Australian & New Zealand Journal of Psychiatry, 47(8), 710-727.*

[14] *Bratsos, S. and Saleh, S.N. (2019). Clinical efficacy of Ketamine for treatment-resistant depression. Cureus, 11(7).*

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242278

The Symbolization of Violence Aesthetic and Cultural Integration in One Piece: A Case Study of the Thriller Bark Chapter

Siyuan Lu[1,a,*]

[1]*University of Shanghai for Science and Technology, Shanghai, 200093, China*
a. 3452664919@qq.com
**corresponding author*

Abstract: Postmodernism in the 20th century gradually developed "violence" into an artistic aesthetic, and due to different understandings of "violence" in various countries, it has spawned a variety of branches. In order to disseminate its works to audiences from different cultural backgrounds, *One Piece* combines Japanese indigenous violence aesthetics with the violent cultures of various cultures, making it a successful example of cross-cultural communication on a global scale. To understand the process of symbolic re-encoding of Japanese native violence aesthetics and British violence aesthetics in *One Piece*, as well as the way in which values are integrated, this study selects the Thriller Bark Chapter (episodes 337 to 380) in *One Piece* as a case for analysis. The study extracts references to British culture and Japanese native culture within the text as "cultural symbols," a unit of visual analysis, and further divides them into four major categories: natural symbols, artificial symbols, character symbols, and language symbols. Statistical analysis reveals that, due to the close relationship between British horror violence culture and the development of its Gothic literature, the author has incorporated a large number of Gothic cultural symbols in the Thriller Bark Chapter. Meanwhile, the work consistently upholds the fundamental principles of Japanese native culture while also revitalizing its own cultural identity.

Keywords: *One Piece*, violence aesthetics, symbolization, intercultural.

1. Introduction

Violent cultural products originated from people's fear and opposition to historical wars and conflicts. After the mid-20th century, postmodernism gradually developed the depiction and representation of violent acts in literary, cinematic, and dramatic forms of art as a form of art that challenges traditionalist thought and values[1]. In the history of the development of Japanese violent aesthetics, animation is an important branch of development[2]. Japanese animation has not only successfully stylized the Japanese violent aesthetic, but also has a wide dissemination range internationally.

One Piece is a comic work by the famous Japanese manga artist Eiichiro Oda. In the work, the author draws on cultural elements from multiple countries including China, the United Kingdom, Italy, Oceania, etc., to build a grand and rich "*One Piece*" worldview for the protagonist group led by Luffy. The depiction of violent content in the *One Piece* animation serves to illustrate the protagonist group's resistance against powerful political forces and hegemony. This element is crucial in

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242278

reflecting the ongoing struggle against oppressive power dynamics.Due to the cultural, historical, and cognitive differences among countries, Eiichiro Oda incorporated Japanese violent aesthetics with those of other cultures, re-encoding process aimed to create a cross-cultural work for global dissemination. Currently, "*One Piece*" has been officially recognized by Guinness World Records as the "comic series with the highest circulation created by a single author in the world." [3]

To understand the integration process of Japanese native violent aesthetics and the violent aesthetics of various countries in "*One Piece*," it is necessary to refine the references to the cultures of various countries in the creative content into the visual unit of "cultural symbols" for analysis. "Cultural symbols" are the classic representative images formed by the accumulation of history and culture, encompassing categories such as language and script, myths and legends, and values and beliefs [4]. Animation is also a cultural product composed of "cultural symbols". The integration and dissemination of cultural symbols can effectively avoid the issues of cultural misinterpretation and cultural discount that may arise from the dissemination of single cultural symbols [4]. This paper takes the Thriller Bark Chapter (episodes 337-380) in *One Piece* as a case study for analysis, classifying the cultural symbols in the work into four major categories: natural symbols, artificial symbols, character symbols, and language symbols [4]. The article delves into the process of symbolically re-encoding violent elements from British culture and integrating them with the values of Japanese native violent aesthetics in *One Piece*.

2. The British cultural symbols in the Thriller Bark chapter

Samovar points out that due to the sense of security brought about by cultural proximity, the historical background and values depicted in cultural products are often more readily received and chosen by audiences who already have similar experiences [5]. The British horror violence culture is inextricably linked to the prosperity of its Gothic culture, which has been selected and utilized by the author of *One Piece* in the Thriller Bark chapter.

Gothic literature originated in the mid-18th century, characterized by a strong sense of repression, sorrow, and silence, and its prosperity was due to the bloody dictatorship during the French Revolution [6]. Centuries of warfare have brought indescribable pain to Britain, with scenes of brutal and bloody massacres everywhere. Meanwhile, the excessive repression of religious ethics also keeps people in a long-term atmosphere of suppression [6]. Gothic literature derives inspiration from the literary works of predecessors, folk tales, the *Bible*, and Christian legends. It utilizes the backdrop of ruins, wilderness, castles, and churches from the past to set the stage for its narratives. It depicts bizarre and inexplicable supernatural plotlines, along with the repressed and confused psychological activities of the characters, to explore human nature and morality [7].

In the Thriller Bark chapter, the author draws on numerous British Gothic cultural symbols for the scene setting and creates many significant characters that draw on classic images from British history. This creative approach not only makes it easier for British audiences to remember but also endows the work with a tangible sense of historical depth, laying an important foundation for the cross-cultural dissemination of Japanese anime around the world.

Table 1: The British cultural symbols in the Thriller Bark chapter

Symbol type	Concrete symbol	
Natural symbol	Overcast sky, heavy rain, dense fog, midwood, spider	
Artificial symbol	Artifact symbol	English tea cup, walking stick, top hat, stand-up collar cape, carriage, fur marten cape, coffin, salt

DOI: 10.54254/2753-7064/40/20242278

Table 1: (continued).

	Artificial architectural symbol	Derelict ship, abandoned castle, graveyard, fireplace, frescoes, underground laboratory, arena
	Folk symbol of life	Ghost, mysterious disappearance, rise from the dead, hell, zombie, midnight, plague
	Artistic symbol	Piano, violin, *Binks's Wine* (The Song That Connects the Past and the Present)
Character symbol	Brook (a mobile skeleton with the image of a British gentleman musician), Cerberus (Guardian Hound of the Underworld), Hilton (inspired by vampires), Ho Gu Barker (The doctor who experimented with zombies), Cindry (A maid zombie who enters the body of a dead stage actor to test the rich man's heart), Gekko Moria (Inspired by Dracula, capable of stealing others' shadows), Perona (Princess Mononoke who can manipulate ghosts), Stronger	
Language symbol	People, once their shadows are taken away, will turn to ashes when exposed directly to sunlight; Believing that manipulating life and death goes against the divine way; The entire story takes place on an isolated island; Being passed through by a ghost can make one become negative; Recording the performance with a conch shell before dying in a maritime disaster (inspired by the movie Titanic);	

2.1. Gothic use of natural symbol

As shown in Table 1 of the natural symbol category, at the beginning of the Thriller Bark chapter, the sky becomes gloomy, and the sea is covered by a dense fog that never dissipates all year round. In the plot setting, this place is known as the Phantom Sea area, where ships disappear all year round. The natural cultural symbol of "dense fog" has a particular historical significance in the UK, often depicted as a malevolent presence associated with crime and horror. This is due to the fact that London, known as the "fog capital" in reality, has suffered greatly from air pollution in history [8]. The dense fog had a severe impact on the lives of London residents, causing a sharp increase in the mortality rate of Londoners at that time, with deaths caused by heart failure, pneumonia, lung cancer, influenza, and other respiratory diseases multiplying. Therefore, by using the natural cultural symbol of "dense fog" throughout the story, it can better resonate with the British audience's feelings towards "death" and "horror." Subsequently, natural symbols such as heavy rain, midwood, and spiders further accentuate this atmosphere, permeating throughout the entire chapter.

2.2. Gothic use of artificial symbol

The second plot scene of the Thriller Bark chapter shifts to a huge abandoned three-masted sailing ship. As shown in the category of artificial symbols in Table 1, the protagonist passed through a dark cemetery, encountered an attack by zombies crawling out of the cemetery, and fled to an abandoned ancient castle. The interior of the castle is a classic British design, filled with zombies, ghosts, a gloomy underground laboratory, and a bloody arena. Each of these scene designs invariably references the classic artificial cultural symbols from British Gothic culture.

In the classification of life and folk custom symbols, "plague" is also the source of horror in Gothic literature [6], and this symbol is also used in the plot. The musician Brook, wandering in the Sea of Shadows, has had his shadow taken away and cannot be exposed to direct sunlight. He has been adrift in the Sea of Shadows for 50 years, showing signs of mental disorder. Prior to this, the pirate crew

DOI: 10.54254/2753-7064/40/20242278

that Brook was part of also experienced a plague, which ultimately resulted in the death of their captain.

2.3. Gothic use of character symbol

As indicated in the category of character symbols in Table 1, the first character to appear in the Thriller Bark chapter is the wandering musician Brook in the haunted sea area, whose image of wearing a British-style cape, holding a cane and teacup is filled with Gothic cultural symbols. Subsequently, the character Hilton's image as a sharp-eared bat, along with Gekko Moria, who slicks back his hair, has sharp teeth, and wears a black stand-up collar cape, allowed the audience to accurately identify the "vampire" as a British cultural symbol derived from their own cultural accumulation.

The term "vampire" has its origins in the religious conflicts of Eastern Europe. Count Dracula, who ruled over Transylvania, gained notoriety for his harsh treatment of a large number of civilians, leading to his brutal reputation as the archetype of a vampire. In the writings of authors, vampires sustain their supernatural abilities by feeding on the blood of humans, much like a ruthless count maintains his authority through murder and bloodshed. [6]. The term was later brought to England by immigrants [9], and it flourished with the rise of Romanticism. Initially, the cultural symbol of "vampires" was used to express resistance to the predatory actions of the nobility and Jews. Subsequently, the "vampire" gradually evolved into a cultural symbol associated with love and individualism [10]. In *One Piece*, the author selects the early connotations of the cultural symbol "vampire" to enhance the sese of oppression and gloom of the story's background.

Additionally, the prototype of the physician Ho Gu Barker, who is keen on zombie resurrection experiments, is believed to be Dr. Moreau, the protagonist in H.G. Wells's novel *The Island of Dr. Moreau*. As listed in Table 1, characters such as Cerberus, the guardian of the underworld, Persephone, the ghost princess capable of manipulating spirits, and the maid who enters the body of a stage actor to become a zombie in order to test the sincerity of a wealthy individual, all other main characters are imbued with the character colors of Gothic literature.

2.4. Gothic use of language symbol

Linguistic symbols demonstrate in Table 1, the author's process of re-encoding language, deepening the narrative core of British Gothic culture within the text. In the plot, after Brook and his companions died, due to the magic of the Revive-Revive Fruit, his soul returned from the underworld to his skeletal body, allowing him to be resurrected from the dead. Before his death, Brook and his companions recorded a song together using a conch shell, titled *Bink's Wine*. This plot draws on the scene before the maritime disaster in the classic British film, Titanic.

In addition, the main character, Gekko Moria, has the ability to steal people's shadows to gain energy. People who have had their shadows taken will turn to ash when exposed to direct sunlight and can only live in the perennially gloomy Phantom Sea area. This plot is a re-encoding of the traditional vampire novel's storyline, imposing the curse that vampires suffer upon numerous victims, which implicitly contains a deep-seated fear of "inability to return to society." The smallpox of the 18th century in England was repeatedly depicted in Gothic works, precisely because patients who had suffered from smallpox, due to their repulsive scars, were despised by others and unable to reintegrate into society, only able to wander like ghosts.[6] The fear of loneliness contributes to the adaptation of this plot, aligning it with the horrorcore elements found in Gothic novels.

In the book *The Island of Dr. Moreau*, Dr. Moreau conducts surgical transplantation experiments on a nameless island, altering the bodies and brains of animals so that they can speak. This plot coincides with the scenario where Ho Gu Barker places human shadows into the bodies of animals to

DOI: 10.54254/2753-7064/40/20242278

create talking animal zombies. The difference lies in the fact that the fear in the original book's plot comes from technology, which transfers anxiety and horror to a futuristic sci-fi gothic setting, while the plot re-encoded in the animation still attributes fear to the supernatural ability of the Devil Fruit.

3. Japanese Cultural Fusion in the Chapter "Thriller Bark"

As shown in Table 2, the Japanese cultural symbols featured in the Thriller Bark Chapter are quite limited, only reflected in the white boat floating in the sea that appears in the beginning, the Japanese exorcism items that the main characters bring out when facing ghosts, swordsman zombies infused with Brook 's shadow. However, in the cultural system, the dominant elements such as language, customs, architecture and so on belong to the surface part of culture, while the core part includes values, history and attitudes to time and space[11].

The use of Japanese language symbols enables "*One Piece*" to inject Japanese values into the "Thriller Bark" story. In a manner of speaking, in *One Piece*, the use of British cultural symbols sets the stage for the story to take place, and the action style in line with Japanese values displayed by the main characters represented by Monkey D Luffy promotes the development of the story, making it merge into a new story of the fusion of British and Japanese cultures.

Table 2: Japanese Cultural Symbols in the Chapter "Thriller Bark"

Symbol type	Concrete symbols	
Natural		
Artificial symbols	Utensil symbol	Floating white boat
	Artificial architectural symbol	
	Life and folk symbol	Japanese exorcism props
	Artistic symbol	
Character symbol	Swordsman zombies infused with Brooke's shadow	
Language symbol	Keep promise: A pact between the skull and the whale and they wait for each other for 50 years; they are willing to die for each other and regard death as a kind of honor; spiritual victory	

3.1. The Use of Universal Value

Different cultures have similar universal values[12]. The presentation of the universal value of Japanese culture in *One Piece* has increased the intercultural acceptance of audiences from different countries.

In *One Piece*, the youth theme focusing on dreams and growth sets the overall tone of inspiration and humor for the work, dispelling the fear of the unknown in traditional British Gothic literature. There are many humanized descriptions of the life details of ghosts and zombies in the chapter "Thriller Bark", such as the tree-shaped zombies sitting together to drink, ghost paper figures who are afraid of fire, and boar bride zombies who are forced to marry. Moreover, the unease and fear of the Gothic setting are diluted by Luffy's unafraid attitude toward supernatural phenomena, the protagonist group's teasing of Cerberus's appearance, and Brook's ever-cheerful attitude.

At the end of this chapter, the protagonist group successfully defeated the evil forces led by Gekko Moria; the universal value of the inevitable victory of good over evil is mentioned again: the protagonist group successfully dispelled the Gothic terror that adds misfortune to people through their own optimism and efforts, making the victims whose shadows have been taken away can live under

DOI: 10.54254/2753-7064/40/20242278

the sun again. At the end of the chapter, Brook plays "Bink's Sake" again with the new partners, symbolizing the connection between the past and the present and the new beginning.

3.2. Integration of Violence Aesthetics of Japanese Bushido

"The Chrysanthemum and the Sword" by Ruth Benedict provides a comprehensive overview of the core characteristics of Japanese culture, in which the "chrysanthemum" and the "sword" respectively represent the gentle and elegant temperament of the Japanese and the spirit of Bushido, reflecting the contradictory character of the Japanese people, which is rough and warm, low self-esteem and pride[13]. Bushido spirit is the core value of Japanese violence aesthetics. The Japanese advocate the aesthetics of mono no aware, and appreciate the aestheticism of "the moment of death is eternal", so the presentation of the spirit of Bushido in Japanese works has an aesthetic trend of "vanishing beauty"[14], and pays more attention to the emotional expression of violence.

Although *One Piece* is an entertaining and uplifting animated series, it always carries the spirit of Bushido and the aestheticism of "vanishing beauty". In the 43 episodes of the chapter "Thriller Bark", there is a fight in almost every episode.. In the course of the fights, Luffy, Solon and other people have been wounded and even almost died. The physiological state of "near death" is used to interpret the unique "vanishing beauty" of Japanese Bushido. This is because in the Bushido spirit, death can wash away stigma and shame and is an act of protecting self-respect[14]. The pirates often regard death as an honor in the plots. At the end of the chapter "Thriller Bark", Shichibukai is about to execute Luffy, but both Sauron and Sanji are willing to die in his place, as shown in Table 2. Finally, Bushido's cultivation of thought with spiritual supremacy moves Shichibukai, so he lets go of the protagonist group.

The emphasis on commitment in the spirit of Bushido also runs through the whole chapter "Thriller Bark". In Table 2, Before leaving, Brook and the crew make an agreement with Raab, a whale who has always followed the ship, to meet five years later; but due to the death of the crew and the curse, they are unable to fulfill the agreement. To keep their promise, the crew insists on recording the music with conches before they die, and this music is kept by Brook. Brook and the whale Raab have always remembered this agreement, which has lasted for 50 years.

3.3. The Re-update of Traditional Japanese Values

Hofstede proposed four dimensions to measure cultural differences: the power gap attribute, the avoidance of uncertainty, the individualism or collectivism attribute, and the degree of masculinity and femininity[15]. It is the cultural differences of these four dimensions that lead to misreading and incompatibility in the process of cultural communication. For the sale of spreading the work around the world, *One Piece* has re-updated some traditional Japanese values in the creation process.

In the traditional Japanese family structure, men and the elderly wild more power than women or young people. It is also pointed out in Hofstede's research that Japan is a country with the highest degree of masculinity[15]. However, in the world of "*One Piece*", where power is determined by strength, there are numerous women who enjoy strength and power, and women's power is also valued. In this work, there are some female characters who deviate from the traditional image of women in Japanese culture where they typically adhere to societal expectations and prioritize family responsibilities. , such as Nami, who is keen to avoid danger and lead the team to solve puzzles, and Robin, who is calm and the main force of the team.

Hofstede's research indicates that Japan promotes a collectivist culture, whereas many countries around the world, such as the United States and Britain, promote an individualistic culture.[15]. For the cross-culture communication, "*One Piece*" combines individualistic and collectivist modes of action. For instance, in the chapter "Thriller Bark", even powerful individuals need the assistance of

DOI: 10.54254/2753-7064/40/20242278

partners, which underscores the importance of collective strength. Nevertheless, the fighting scenes in the animation are always in the form of 1V1, advocating relying on individual strength to win. Each character of the protagonist group has its own distinctive personality and story, and individual freedom and choice are constantly mentioned.

4. Conclusion and Expectations

Cultural convergence is the invasion of a strong culture to a weak culture, while cultural fusion emphasizes the equal relationship between cultures. The absorption, transformation and renewal of different cultures promote the optimization and diversity of culture. *One Piece* provides a grand and diversified cultural stage for the story using cultural symbols of various countries. This work enables the audience to feel the novelty brought by cultural differences while minimizing cultural misreading through the selection of universal values and the spirit of Bushido in Japanese culture, and the re-update of its own culture. Based on the integration of the culture of various countries, the spirit of Japanese Bushido, and the Japanese violent aesthetics of "vanishing beauty", *One Piece* has prompted global audiences to contemplate deeply on the themes of humanity, morality and warfare.

This approach of intercultural communication incorporating local culture with cultures of other countries makes *One Piece* a classic work, which also serves as a successful reference for future cross-cultural communication of cultural products. This research solely examines the work through an analysis of plot symbols, and does not delve into the creative background and ideation process behind the work. In addition, the fusion process of Chinese, Italian and Oceanian cultures in other chapters of *One Piece* could be subject to future study.

References

[1] *Zhang Shujin. On the Nature and Aesthetic Meaning of "Aesthetics of Violence"[J]. Contemporary Cinema,2010(10):103-109.*

[2] *Zhu Lixin. The Aesthetics of Japanese Science Fiction Animation under the Collision of Aesthetics[J]. Modern Communication(Journal of Communication University of China),2022,44(03):117-124.DOI:10.19997/j.cnki.xdcb.2022.03.010.*

[3] *Haiyan Zhang. Multicultural Interpretation of the Anime "King of Thieves"[J]. Journal of Shanxi Datong University (Social Science Edition),2019,33(05):78-81.*

[4] *Fan Hong,Su Shin. Strategic Communication of National Image and Cultural Symbol System - An Examination Based on the Practice of Japanese Cultural Symbol Communication[J]. Modern Communication(Journal of Communication University of China),2022,44(06):77-86.DOI:10.19997/j.cnki.xdcb.2022.06.019.*

[5] *Chang Yanrong. On three modes of intercultural communication [J]. Journal of Hunan University (Social Science Edition),2003(03):100-103.*

[6] *He Songbei. The realistic origin of fear in gothic literature[J]. Science and Technology Information,2010(28):196+199.*

[7] *Wang Zhen. Research on the tradition of British and American Gothic literature[J]. Journal of Changchun Normal University,2017,36(07):131-133.*

[8] *Bi Fang. The "Fog City" Hat Removal: The 1952 London Smog Incident[J]. China Disaster Reduction, 2021(8):30-35. DOI:10.3969/j.issn.1002-4549.2021.08.007.*

[9] *Zhang, Xiaoli. Theme Analysis of Nineteenth Century British Vampire Literature[J]. Journal of Hubei Second Normal College,2015,32(05):5-7.*

[10] *Shao Xiaotang. The Shaping of Western Classical Cultural Symbols from the Changes of Vampire Image in Literary Narratives[J]. Western Journal,2022(20):41-44.DOI:10.16721/j.cnki.cn61-1487/c.2022.20.010.*

[11] *Wang JH. Cultural integration and cultural self-awareness under cross-cultural communication[J]. Heilongjiang Social Science,2007(02):101-103.*

[12] *Fu Zhenxing. On the Cultural Mixture and Cross-cultural Communication Strategy of American Animation [D]. Central China Normal University,2010.*

[13] *Ruth Benedict: The Chrysanthemum and the Knife (Updated Edition), Translated by Lu Wanhe, Beijing: Commercial Press, 2012.*

[14] *Yang Qingyu. Japanese gangster films under the cultural aesthetic perspective[J]. Film Literature,2018(14):58-60.*

DOI: 10.54254/2753-7064/40/20242278

[15] Steve Mortensen, edited by Steve Mortensen, Intercultural Communication: An Eastern Perspective, translated by Guan Shijie and Hu Xing, Beijing: China Social Science Press, 1999 ed.

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242268

The Role of Stress in Obesity and Relevant Interventions

Menglin Guan[1,a,*]

[1]*Xi'an Jiaotong University, Xi'an, China*
a. guanmenglin@jiaotong.university
**corresponding author*

Abstract: The prevalence of obesity is on the rise, which significantly increases the burden on global healthcare expenditures and profoundly impacting both physical and mental health. It has become a major public health challenge that urgently needs to be addressed in today's society. Obesity is influenced by multiple factors, including stress, genetics, hormones, and neuroendocrine elements, with lifestyle and epigenetic changes also playing significant roles. Stress impacts various physiological systems, including the brain, memory, cognition, immune response, cardiovascular health, and endocrine function. It can also trigger obesity by affecting appetite regulation, reward sensitivity, and hormonal balance. Understanding the relationship between stress and obesity is crucial for developing effective interventions. Recent research highlights that stress significantly affects eating behaviors, leading to weight gain, while obesity can exacerbate stress and disrupt life balance. Effective interventions include mindfulness training, which improves self-awareness, positive emotions, and psychological flexibility, and reduces stress, anxiety, and depression. Stress management programs and physical activity are also beneficial for weight loss and overall health. However, the limitations of small sample sizes, short intervention periods, limited participant diversity, and reliance on self-reported measures may undermine the generalizability and accuracy of the findings of previous research. Future research should focus on larger, diverse samples, long-term studies, and incorporate both objective measures of stress and self-reported data to better understand and manage obesity and stress.

Keywords: stress, obesity, mindfulness intervention, eating behaviors, physical activity.

1. Introduction

Obesity is characterized by excessive body fat accumulation, typically measured by a Body Mass Index (BMI) over 30, and is associated with various health issues like diabetes and cardiovascular diseases [1]. Stress is the psychological and physiological response to challenges and demands from external or internal sources, leading to feelings of tension and anxiety [2]. Understanding the link between stress and obesity is crucial as it can reveal how stress contributes to unhealthy eating behaviors and metabolic changes, which in turn lead to weight gain. Studying this topic can lead to the development of targeted interventions, such as stress reduction programs, cognitive-behavioral therapy, and supportive environments. These interventions can help individuals manage stress more effectively, thereby preventing obesity and promoting overall health.

Obesity has dramatically increased in recent decades due to a combination of environmental, hormonal, and genetic factors [1]. Environmental contributors include reduced physical activity,

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242268

sedentary lifestyles, high-calorie diets, and certain medications. Genetic variations may predispose some individuals to obesity even with similar environmental exposures. Many genes associated with obesity interact with each other, and twin studies show a high heritability for eating behaviors, ranging from 53% to 84%. The fat mass and obesity-associated (FTO) gene, though well-studied, shows modest effects and lifestyle interactions. While monogenic obesity is rare, up to 200 single-gene mutations are known. Syndromic obesity, such as Prader-Willi, Bardet-Biedl, and Cohen syndromes, is uncommon but noteworthy. Neuroendocrine factors, like hypothyroidism and polycystic ovary syndrome (PCOS), also contribute.

Recent research highlights the role of epigenetic factors, including DNA methylation, microRNA expression, and noncoding RNAs, in obesity. Unlike genetic factors, epigenetic changes can occur throughout life due to lifestyle influences such as diet and physical activity. Understanding the central nervous system's role in appetite regulation, beyond the traditional focus on the hypothalamus, is crucial. Recent studies emphasize the importance of reward, emotion, memory, and cognitive control networks. Theories suggest that reduced sensitivity to rewards drives the consumption of high-fat or high-calorie foods, or increased sensitivity to food cues leads to excessive eating. This is supported by lower availability of dopamine D2 receptors and heightened brain activity in response to food cues in obese individuals. Obesity is linked to increased mortality, metabolic syndrome (insulin resistance, dyslipidemia, hypertension, type 2 diabetes), and worsened PCOS through insulin resistance and hyperandrogenism. It exacerbates obstructive sleep apnea (OSA) and raises cancer risk, with higher BMI correlating with greater risk. Addressing obesity is crucial for overall health improvement [1].

Stress triggers a biological response and can act as both a catalyst and an aggravating factor for many diseases and pathological conditions. Its impact is far-reaching, affecting multiple physiological systems including the brain, memory, cognitive learning, the immune system, the cardiovascular system, the digestive system, and the endocrine system. For instance, chronic stress has a profound effect on brain function, leading to brain atrophy and reduced volume, particularly in the hippocampus, which plays a crucial role in memory, cognition, and emotional responses. Stress hormones like cortisol can cause hippocampal atrophy, hinder neurogenesis, and impair both spatial and declarative memory [2].

The effects of stress on memory are complex; it can enhance or impair memory depending on the type, intensity, and duration of the stress. While acute stress, such as that experienced during exams, can temporarily boost memory, chronic stress often leads to memory impairments. Stress also influences cognitive learning by affecting neurotransmitters and neuropeptides, thereby impacting learning, decision-making, attention, and judgment. The immune system is similarly affected, with stress altering immune cell activity and hormone secretion, which can increase susceptibility to infections and diseases. The cardiovascular system is notably responsive to stress. When stress activates the sympathetic nervous system, it causes an elevated heart rate and constriction of blood vessels, subsequently increasing the risk of developing heart disease and hypertension. Stress also affects the digestive system by altering gastrointestinal motility, absorption, secretion, and inflammatory responses, increasing the likelihood of disorders such as irritable bowel syndrome and inflammatory bowel disease. Moreover, stress interacts broadly with the endocrine system, affecting processes related to the hypothalamus, pituitary gland, adrenal glands, and other endocrine organs. Research on stress is essential, as it sheds light on both its beneficial and detrimental effects on health. While stress plays a role in maintaining cellular and species homeostasis, severe or prolonged stress can lead to various pathological conditions. Understanding the intricate ways stress affects the body through hormones, neuroendocrine mediators, and other factors is crucial for developing effective treatments to manage stress-related conditions [2].

The reviewed literature highlights the multifaceted impact of stress on various physiological and psychological systems, including brain function, memory, cognition, immune response, and

DOI: 10.54254/2753-7064/40/20242268

cardiovascular health. Concurrently, the mechanisms underlying obesity, such as genetic predispositions, environmental factors, central nervous system regulation, and homeostatic disruptions, are well-documented, along with its associated endocrine disorders and comorbidities. This review aims to bridge these domains by exploring the impact of stress on obesity, additionally, it will examine factors that may mediate the relationship between stress and obesity, providing a comprehensive understanding of their interrelationship.

2. The Relationship between Stress and Obesity

It is suggested that perceived stress among adolescents is significantly associated with higher levels of overweight/ obesity. Roy and his colleagues conducted a questionnaire test with 20 university students, using a stress questionnaire to assess the perceived stress among adolescents. Roy and his colleagues conducted related research using questionnaires to test 20 university students. The test covered six main areas: demographic background, socioeconomic information, physical activity, stress, eating behavior, and anthropometric data. The stress section of the questionnaire assessed ten different aspects of stress: family life, academic performance, school attendance, romantic relationships, peer pressure, teacher-student interactions, uncertainty about the future, conflicts between school and leisure, financial pressure, and emerging adult responsibilities. Additionally, the Dutch Eating Behavior Questionnaire was used to assess students' eating behaviors. This questionnaire measures three main aspects: first, emotional eating, which focuses on overeating in response to emotional stimuli. Second, external eating, which looks at eating in response to food-related cues without considering internal hunger and satiety; and third, efforts to control food intake, which examines restrictive eating behaviors. The students' BMI was also assessed [3]. The experimental data demonstrate that the majority of adolescents are experiencing moderate (55.7%) to extremely severe (61.5%) levels of stress. Among those with high stress, 28.5% are overweight or obese. All three types of eating behaviors are significantly positively correlated with adolescents' perceived stress and BMI. These results suggest that stress significantly influences eating behaviors, potentially leading to weight gain. Notably, among adolescents, only restrained eating behavior has a direct and significant link to overweight and obesity, indicating that efforts to control food intake might be more effective in managing weight than addressing emotional or external eating patterns.

In terms of stress assessment, Roy and his group primarily studied university students. Whether the impact of stress on eating behaviors and obesity can be generalized to a broader population requires further research. It has been shown that similar conclusions can be reached when the study population includes adult men and women from diverse backgrounds. Qiu and his colleagues did not find a direct association between stress life events and obesity. However, unhealthy eating behaviors, such as binge eating, dining out, irregular meal times, and eating before bedtime, significantly influenced the relationship between stress and obesity. They used a stress life events scale related to life events to assess the stress life events of Chinese civil servants. The scale includes 48 items, divided into several dimensions, including family-related events, work-related events, study-related events, health-related events, accident-related stress events, legal disputes, and economic issues. The study evaluated the dietary patterns of Chinese civil servants through four items. The questionnaire also assessed whether employees exhibited any of the following unhealthy eating behaviors in the past year: irregular meal times, binge eating, frequent dining out, and eating before sleep [4]. The data reveal that stressful life events among government employees are significantly associated with overeating, eating before bedtime, and eating out, all of which are significantly related to the risk of obesity. Stressful life events indirectly influence obesity through irregular meal timing. Overeating and eating out have significant mediating effects between stress and obesity, while the mediating effect of eating before bedtime is not significant for baseline obesity but is significant for obesity at follow-up. These results suggest that stress influences eating patterns, leading to unhealthy behaviors

DOI: 10.54254/2753-7064/40/20242268

that contribute to obesity. Consequently, interventions aimed at reducing obesity among government employees should focus not only on stress management but also on promoting healthier eating habits.

In studying the impact of stress on obesity, it has also been thoroughly investigated whether obesity itself increases stress and affects life. Kathleen and his associates found that obesity and conditions limiting physical activity negatively impact life balance and increase stress [5]. The research focused on adults aged 18 to 49 with self-reported medical conditions that restrict physical activity. Life balance was measured using a scale assessing alignment between the time spent on 53 activities and the time desired for these activities. This scale includes four subscales corresponding to demand dimensions: Health, Relationships, Identity, and Challenge. Perceived stress was measured with the questionnaire, which asked respondents about their feelings and thoughts over the past month, including four key items: feeling unable to control important aspects of life, confidence in handling personal issues, the perception that things are improving, and feeling that difficulties are piling up and are insurmountable.

The data signify that the obese group experienced higher perceived stress compared to the normal BMI group, with a larger mean difference in the life balance scale, indicating a more significant negative impact of obesity on life balance. Individuals with physical activity limitations had lower life balance scores and higher perceived stress compared to those without such limitations. The study highlights the need for interventions that promote balanced lifestyles and effective stress management, especially for those affected by obesity and restrictive medical conditions.

Research indicates that perceived stress is correlated with levels of overweight and obesity. While stress affects eating patterns and leads to weight gain, further research is needed to generalize these findings across different populations. Additionally, obesity itself increases stress and disrupts life balance, highlighting the need for interventions that combine stress management with promoting healthy eating habits and balanced lifestyles.

3. Effective Interventions for Individuals with Obesity

Research shows a direct link between perceived stress and obesity. Addressing this connection highlights the need for effective interventions to manage stress and its impact on weight. There is a significant relationship between stress and obesity, suggesting that effective stress management should significantly improve weight loss outcomes and mental health in this population. Niovi and his colleagues conducted relevant research in this area. This study involved 45 adults with obesity, divided into two groups: an experimental group (22 participants) and a control group (23 participants). All participants received standard healthy lifestyle guidance, but the experimental group also attended stress management sessions. These sessions were led by a professional with expertise in stress management, covering techniques such as progressive muscle relaxation, diaphragmatic breathing, and guided visualization. The study also utilized the Greek version of the PSS 14 to assess participants' stress levels, which measures perceived stress in response to life situations. This self-report tool was designed to evaluate the frequency of certain emotional states and thoughts over the past month [6]. The data show that significant differences were observed between the intervention and control groups in terms of BMI, stress levels, and eating habits before and after the intervention. These statistically significant differences suggest that the intervention may help in weight reduction. Additionally, the intervention group showed a significant decrease in perceived stress levels, positive changes in eating habits, notable improvements in physical activity, and increased satisfaction in various aspects of life. The research results indicate that incorporating stress management into obesity treatment can be more effective than standard lifestyle counseling alone.

In addition to common stress management techniques such as progressive muscle relaxation and diaphragmatic breathing, mindfulness interventions are also considered to play a crucial role in stress relief. Mindfulness refers to a mental state and practice defined as focusing on and accepting present-

DOI: 10.54254/2753-7064/40/20242268

moment experiences. It involves paying full attention to current sensations, thoughts, and emotions without judgment. Hooker and his research team found that for adults with obesity, mindfulness interventions can enhance mindfulness, positive emotions, psychological flexibility, and reflective thinking while reducing perceived stress, anxiety, depressive symptoms, and rumination [7]. The study enrolled 194 participants with BMI levels ranging from 30 to 45.9 kg/m², randomly assigning them into two groups. One group, consisting of 100 participants, received the mindfulness intervention, while the other group, with 94 participants, served as an active control. Both groups underwent changes in diet, exercise, and stress management, with the key difference being that one group received mindfulness training. To measure mindfulness, the researchers used the Five Facet Mindfulness Questionnaire (FFMQ), which includes 39 items covering five core facets: (1) observing sensations and thoughts; (2) describing with words; (3) acting with awareness; (4) non-judging of inner experience; and (5) non-reactivity to inner experience. Additionally, the 10-item Perceived Stress Scale was used to assess how stressful participants perceived their environment to be over the past month. The results showed that participants in the mindfulness group experienced significant improvements in overall mindfulness at both 6 and 12 months, as well as increased positive emotions at the follow-up point (conducted at 4 months). The study suggests that integrating mindfulness training into weight loss programs can foster positive psychological changes and improve mental health, highlighting the potential long-term benefits of mindfulness for psychological well-being in individuals with obesity.

Hooker 's questionnaire offered a broad assessment of mindfulness but did not thoroughly explore the finer details and specific applications of mindfulness skills. Therefore, Cotter and her research team employed a more detailed mindfulness scale for evaluation and investigation. Using data from 3,708 participants in the MIDUS II study, researchers first recorded whether participants had experienced any of 20 possible stress events during adulthood, such as being fired, losing a child, losing a sibling, or sexual assault. A psychosocial stress score was also created based on three independent stress domains: family stress, friend stress, and financial stress. Participants were asked to answer questions about their eating behaviors when experiencing stress. The researchers used a mindfulness scale to assess participants, the assessment mainly includes: (a) being more involved in the present, (b) being more sensitive to the feelings of others, (c) being more open to new ideas, (d) becoming a better listener, (e) being more patient, (f) noticing small changes in the environment, (g) being more tolerant of differences, (h) being more aware of different ways to solve problems, (i) seeing things in new ways [8]. The data highlight that stress-related eating mediates the relationship between stressful life events and BMI, with a more significant effect observed in women. Weight status also moderates the relationship between stress and stress-related eating, with a more pronounced effect in individuals with obesity. Mindfulness did not have a significant moderating effect in these models. This conclusion differs somewhat from Hooker’s findings [7-8]. A possible reason is that Hooker 's questionnaire may better reflect the deeper traits of mindfulness, which could directly influence an individual's psychological state and, in turn, affect stress and obesity. On the other hand, Cotter’s questionnaire focuses more on changes in behavior resulting from mindfulness rather than its direct psychological regulatory effects, which may lead to less significant results regarding the relationship between stress and obesity.

It is well known that physical activity triggers the release of endorphins, natural chemicals that improve mood and reduce pain. Therefore, in addition to the stress-relieving effects of mindfulness practices, physical activity is also likely to have a role in regulating stress. Andrea and her colleagues conducted related research and found that higher stress levels reduce physical activity, and increased physical activity reduces stress [9]. The research involved 74 adult participants (average BMI of 31.2 kg/m²) enrolled in a 3-week Internet-based weight loss program followed by a 9-month observational maintenance period. Participants, aged 18-70 years. At the end of each week, participants were

DOI: 10.54254/2753-7064/40/20242268

required to report their weekly physical activity time on the study website and complete an assessment question about their stress levels to measure the stress they experienced over the past week. The data suggest that there is a significant negative correlation between stress levels and physical activity within the same week. Additionally, higher stress levels significantly predict a decrease in physical activity in the following week, while physical activity levels in the current week significantly predict a reduction in stress levels in the following week. The study results indicate that managing stress is crucial for promoting physical activity in this population, and that engaging in regular physical activity can help mitigate stress, creating a positive feedback loop for better health outcomes.

In the past, stress assessment has typically been conducted using self-report questionnaires, which can be influenced by subjective perceptions. Therefore, identifying a physiological marker that reflects individual stress levels could significantly enhance the credibility of research. Cortisol is considered a potential marker in this regard. Cortisol is a hormone secreted by the adrenal cortex and is one of the key hormones involved in the stress response. Its levels increase with rising stress, making it a physiological indicator of the body's stress response. Consequently, some researchers have studied stress responses through cortisol measurements and analyzed whether cortisol patterns differ between obese individuals and those of normal weight. Benedict and his team found that psychological stress interventions revealed differences in cortisol patterns between the obese group and the normal-weight group. Obesity is associated with lower cortisol activity, which may indicate functional changes in the Hypothalamic-Pituitary-Adrenal (HPA) axis in obese individuals [10]. This study involved stress testing and cortisol concentration measurement in both obese and normal-weight participants. A total of 64 participants were recruited, including 32 obese individuals (17 females, with an average age of 33.94 years) and 32 normal-weight individuals (17 females, with an average age of 29.09 years), all aged between 18 and 65 years.

Researchers measured cortisol levels using a luminescence immunoassay method. They also assessed participants' stress states, focusing on four cognitive appraisal processes: Threat, Challenge, Self-Efficacy, and Control Expectancy. After stress induction, saliva samples were collected, and participants completed a questionnaire. The data indicate that the normal-weight group had significantly higher cortisol levels than the obese group 15 minutes before the stress test. Both groups experienced a substantial increase in cortisol concentration due to stress induction; however, the normal-weight group’s cortisol levels remained higher than those of the obese group. Over time, the pattern of cortisol changes was similar for both groups. The results showed dysregulation of the HPA axis in the obese group, suggesting that obesity may affect stress response mechanisms. Therefore, obesity interventions should not only focus on weight management but also integrate psychological strategies, such as stress management. A comprehensive approach may be more effective in balancing HPA axis function.

4. Conclusion

Studying the relationship between stress and obesity is crucial for developing targeted interventions that address both psychological and physiological factors, ultimately helping to prevent obesity and promote overall health. Research on the relationship between obesity and stress indicates that stress significantly influences eating behaviors, leading to weight gain. At the same time, obesity can negatively impact life balance and increase stress levels. These findings suggest that it is important not only to focus on stress management but also to promote healthier eating habits. Additionally, it is essential to implement appropriate interventions for individuals who are obese and have limited physical activity. Interventions for managing stress and obesity include several key approaches. Mindfulness training has been shown to enhance overall mindfulness, positive emotions, and psychological flexibility while reducing stress, anxiety, and depressive symptoms. Stress management programs incorporating techniques such as progressive muscle relaxation and guided

DOI: 10.54254/2753-7064/40/20242268

visualization also improve weight loss outcomes and mental health. Physical activity is crucial for reducing stress and promoting better health. Additionally, research indicates that addressing cortisol patterns and HPA axis dysregulation through comprehensive psychological and behavioral strategies can be effective in managing obesity and stress.

Recent research highlights the significant role of stress in influencing obesity and eating behaviors, and the potential benefits of interventions such as mindfulness and stress management. However, there are notable limitations. Many studies involve small sample sizes and short intervention and follow-up periods, which may not provide a objective and comprehensive understanding of long-term effects. Additionally, the diversity of participant backgrounds is often limited, potentially affecting the generalizability of the findings. Many studies also rely on self-reported measures, which can introduce biases and inaccuracies in assessing stress and eating behaviors. Future research should focus on overcoming these limitations by incorporating larger and more diverse samples to improve generalizability. Longitudinal studies with extended follow-up periods are necessary to evaluate the long-term effectiveness of interventions. Furthermore, incorporating objective measures of stress and physiological responses, such as cortisol levels, alongside self-reported data can provide a more accurate picture of the relationship between stress and obesity. Exploring the combined effects of stress management and dietary modifications in various populations can also yield valuable insights for developing more effective obesity interventions.

References

[1] *Upadhyay, J., Farr, O., Perakakis, N., Ghaly, W. and Mantzoros, C. (2018). Obesity as a Disease. The Medical Clinics of North America, 102(1), 13-33.*

[2] *Yaribeygi, H., Panahi, Y., Sahraei, H., Johnston, T.P. and Sahebkar, A. (2017). The impact of stress on body function: A review. EXCLI J, 16, 1057-1072.*

[3] *Roy, S.K., Jahan, K., Alam, N., Rois, R., Ferdaus, A., Israt, S. and Karim, M.R. (2021). Perceived stress, eating behavior, and overweight and obesity among urban adolescents. Journal of Health, Population and Nutrition, 40(1), 54.*

[4] *Qiu, D., He, J., Li, Y., Ouyang, F. and Xiao, S. (2023). Stressful Life Events, Unhealthy Eating Behaviors and Obesity among Chinese Government Employees: A Follow-Up Study. Nutrients, 15, 2637.*

[5] *Matuska, K. and Bass, J. (2016). Life balance and stress in adults with medical conditions or obesity. OTJR: occupation, participation and health, 36(2), 74-81.*

[6] *Xenaki, N., Bacopoulou, F., Kokkinos, A., Nicolaides, N.C., Chrousos, G.P. and Darviri, C. (2018). Impact of a stress management program on weight loss, mental health and lifestyle in adults with obesity: a randomized controlled trial. Journal of molecular biochemistry, 7(2), 78.*

[7] *Hooker, A.R., Sagui-Henson, S.J., Daubenmier, J., Moran, P.J., Hartogensis, W., Acree, M., and Hecht, F.M. (2022). Effects of a mindfulness-based weight loss intervention on long-term psychological well-being among adults with obesity: Secondary analyses from the Supporting Health by Integrating Nutrition and Exercise (SHINE) Trial. Mindfulness, 13(9), 2227-2242.*

[8] *Cotter, E.W. and Kelly, N.R. (2018). Stress-related eating, mindfulness, and obesity. Health Psychology, 37(6), 516..*

[9] *Brockmann, A.N. and Ross, K.M. (2020). Bidirectional association between stress and physical activity in adults with overweight and obesity. Journal of behavioral medicine, 43(2), 246-253.*

[10] *Herhaus, B. and Petrowski, K. (2018). Cortisol stress reactivity to the trier social stress test in obese adults. Obesity facts, 11(6), 491-500.*

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242310

Structural and Coherence Analysis Towards The Renunciation

Tian Le[1,a,*]

[1]*School of Foreign Languages, Peking University, 5 Yiheyuan Road, Beijing, China*
a. letian_lotte@stu.pku.edu.cn
**corresponding author*

Abstract: While many researchers have paid attention to Rabindranath Tagore's poems, few have analyzed his short stories, still less on a specific story, like The Renunciation. The fiction critiques the caste system of Hinduism and portrays a unique female character. This paper proposes that structural and coherence analysis can assist in a better appreciation of the story. The disruption of the timeline emphasizes the importance of a series of events occurred in the past. Coherence relations within them are established and analyzed so that the caste system's role as the origin of perpetuating tragedy among Hindus is explicitly revealed. The blank in the timeline along with the nightingale which appears throughout the novel indicates the plight of women in Hindu society. Analyses in this paper provide argumentation for views proposed in previous studies, namely Tagore's firm stance against the caste system and his empathy for suffering women, from a new angle. It also demonstrates the feasibility of linguistic theories' appliance to the field of literary criticism.

Keywords: Tagore, The Renunciation, Coherence relation, Caste system, Female Aphasia.

1. Introduction

In 1913, as English translations of Rabindranath Tagore's Bengali poems won him the Nobel Laurel for Literature, he became the first non-Westerner to be awarded this prize [1]. Despite the household reputation as a lyric poet and a devotee of beauty, his excellence in providing a realistic picture of what he observed via other literary forms ought not to be overlooked [2]. Whilst only a few researchers have analyzed Tagore's short stories as a whole, still fewer have focused on a particular one, let alone as unknown as *The Renunciation*. Though not renowned, it is worth analyzing because it is not only representative of Tagore's criticism of the Hindu caste system but also portrays a female image that lacks actions of resistance, different from the usual ones created by him.

This paper hypothesizes that structural and coherence analysis based on Indrani Deb's English translation of *The Renunciation* can serve as auxiliary argumentation for existing points in Tagore's short stories and consequently fill in a gap in this field [3]. A key assumption is that analysis towards the text itself would lead us to a better understanding of it since discourse relations and complex structures are proven to affect the interpretation of utterances [4].

The paper proceeds as follows. In Sect. 2, a summary of the narrative is provided and former studies are reviewed. In Sect. 3, Tagore's criticism of the caste system of Hinduism in *The Renunciation* is proposed. To motivate this proposal, the paper examines its temporal structure to

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242310

extract the important part and deals with coherence relations within it. Coexisting Result and Parallel Relations are notice-worthy. Sect. 4 includes discussion about how and why a special female image is depicted. The function of a blank in the timeline and the setting of the nightingale are explored respectively. Finally, a conclusion is drawn in Sect. 5. Coherence relations mentioned in this paper are based on Kehler's definitions, which are listed in the footnotes [5].

2. Summary of the Narrative and Previous Studies

The Renunciation is set in a Bengali society where the caste system of Hinduism prevails -- people are rigidly stratified according to their caste: Brahmin, Kshatriya, Vaishya, Sudra and the lowest group 'Dalit', and a couple from different castes is forbidden, otherwise the caste of the family would be tarnished by such 'unholy marriage'. The narrative features conflicts resulting from and resulting in the Hindu caste system. The key topic is whether the protagonist renounces his wife or caste.

The protagonist, Hemanta, was a Brahmin, while his wife, Kusum, was a Sudra who pretended to be a Brahmin. Another character is Pyarishankar (Shankar for short) who incited Kusum to forge her caste. He used to be a Brahmin until dumped from his caste by the community at the instigation of Hemanta's father Harihar. In a spirit of revenge, he brought about Hemanta's marriage to corrupt the caste of his sworn enemy's family. It ends with Hemanta's renunciation from his Brahmin caste.

Databases including ProQuest, Sage, Springer Link, Project MUSE and JSTOR are searched for previous studies on *the Renunciation* or Tagore's short fiction. No existing paper has been found discussing this narrative singly, while Tagore's short stories as a whole have been analyzed by several scholars in the last century. They either studied the literary works in combination with Tagore's personal experiences or simply provided rather subjective appreciation without much evidence. Their findings on the topic are also relatively general. Therefore, it is necessary to focus on a specific work of Tagore, *The Renunciation* in this paper, and pay more attention to the text itself. Theories of discourse relations may assist in the interpretation.

SDRT (Segmented Discourse Representation Theory) is used to fulfill the analyses, in which discourse structures are modeled into graphs made up of two types of semantic discourse units (DUs): elementary discourse units and complex discourse units [6,7,8,9]. An EDU is the most basic element as it often contains only 1 eventuality state or event [10]. A CDU consists of several EDUs or corresponds to many paragraphs or even pages of text. Coherence Relations appear as labels for edges between nodes representing DUs. Each edge may have more than one label [11].

3. Criticism of the Caste System of Hinduism

Choudhurinoticed Tagore's discontent with the Hindu society ridden by backward conventions [12]. Critics such as Thompson pointed out that born in a family closely related to the Brahmo Samaj, which is known for liberated humanism, Tagore accordingly deviated from the rigid caste regulations of the patriarchal Hindu religion in his life, as well as his works [13]. *The Renunciation* could be good proof as its major conflicts and events have countless ties with the caste system of Hinduism.

In this section, proposal is made to achieve a deeper understanding of Tagore's criticism of the rotten caste system. A global analysis of the temporal structure, as Hobbs and Violi have done to *Slyvie*, is developed to discover the author's emphasis [14]. It is thought to be helpful because both *Slyvie* and *The Renunciation* set the order of events differently from that of telling. The emphasized part is further examined in micro analysis by establishing its inner coherence relations.

DOI: 10.54254/2753-7064/40/20242310

3.1. Disruption of the Timeline

The main thread of *The Renunciation* happened in 5 days and is told in 4 parts, covering events that took place at 3 times. The corresponding relationship between them is illustrated in Table 1. The absolute timeline contains 5 days. Part 1 takes place in '*the first full-moon night of the month Phalgun*'. '*The night had not yet passed'* in Part 2 so the plot progresses on the same day. Part 3 opens with '*As soon as the sleepless night had passed...*', and thus occurred on the second day. Part 4 skipped to the fifth day as '*It was the fifth night after the new moon.*'As for the narrative timeline, the story begins at Time 3, namely the present. Then, in Part 3, it traces back to Time 1 when 'Hemanta was far at school in Calcutta' and Time 2 when 'Hemanta was of college-going age'. Finally, it turns back to Time 3 for an ending.

Table 1: The Relationship between 3 Times, 4 Parts and 5 Days

Absolute Timeline	Day 1		Day 2	Day 3-4	Day 5
Story Section	Part 1	Part 2	Part 3	...	Part 4
Narrative Timeline	----> Time 3 ---->		----> Time 3 ---->		
			Time 1 ----> Time 2		

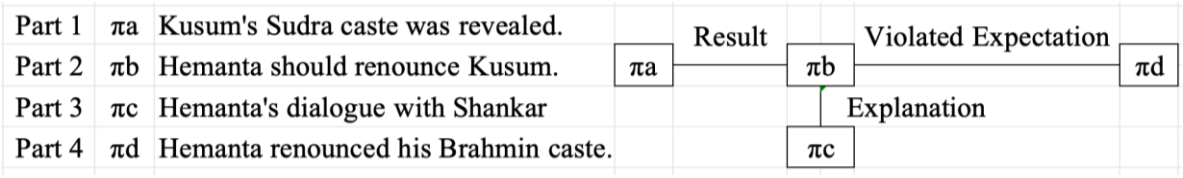


Figure 1: A Global Structure of the 4 Parts[1]

The continuity of the narrative timeline is disrupted by flashbacks in Time 1 and 2 in Part 3. Putting behind Day 3 and 4 (to be discussed in Sect.4), the paper extracts one main DU from each part and draws a graph of the global structure as in Figure 1. As flashbacks in πc explain how the troublesome situation in Time 3 came into existence, and thus the coherence relation between πb and πc is Explanation, a typical subordinating relation [7]. Subordination allows us to skip the subordinate parts and move on coordinately to hierarchically higher situated materials while graphing, yet it doesn't necessarily implicate a lower importance of the subordinate. If DU2 is subordinate to DU1, then the communicative goal of DU1 can't be reached before that of DU2. The processing of DU1 should give way to the subordinate DU2 [15].

With SDRT and the theory of subordinating DUs above, the disruption of the timeline has been converted into the Explanation Relation between πb and πc and can be viewed as a subordinate structure to call for a stop at Part 3, where readers may find out the radical origin of conflicts before they move to Part 4 and finish their reading. Tagore deliberately jumped out of the main timeline to stress the vital importance of Part 3. From another aspect, the amazingly great deal of the length devoted to Part 3, greater than Part 1, 2 and 4 altogether, also shows the emphasis Tagore laid on it, consistent with what we reached by means of linguistic theories.

[1] Result: Infer P from the assertion of S1 and Q from the assertion of S2, where normally P → Q.
Explanation: Infer P from the assertion of S1 and Q from the assertion of S2, where normally Q → P.
Violated Expectation: Infer P from the assertion of S1 and Q from the assertion of S2, where normally P → ¬Q.

DOI: 10.54254/2753-7064/40/20242310

3.2. Karma of Hatred and Avenge in the Caste System

Given the importance of Part 3, micro analysis of it is worthwhile. As Hobbs stressed that our view of the world may be simplified by recognizing coherence relations, Part 3 is separated into more detailed DUs and a graph is accordingly drawn to demonstrate coherence relations within them in Figure 2 [16]. Events narrated in Part 3 can be categorized into πe (The origin of Shankar's hatred against Harihar in Time 1) and πf (Shankar's action of avenge in Time 2). Two non-conflicting relations hold between the two CDUs. The Result Relation is obvious to recognize, and the Parallel Relation can be established as both of them 'had their origin in the caste system and were carried out through the caste system'. To dig it even deeper, DUs subordinate to πe and πf are further analyzed. πe holds an Elaboration Relation with each of π1, 2, 3 and 4, while πf has likewise relation with π1', 2', 3' and 4'.

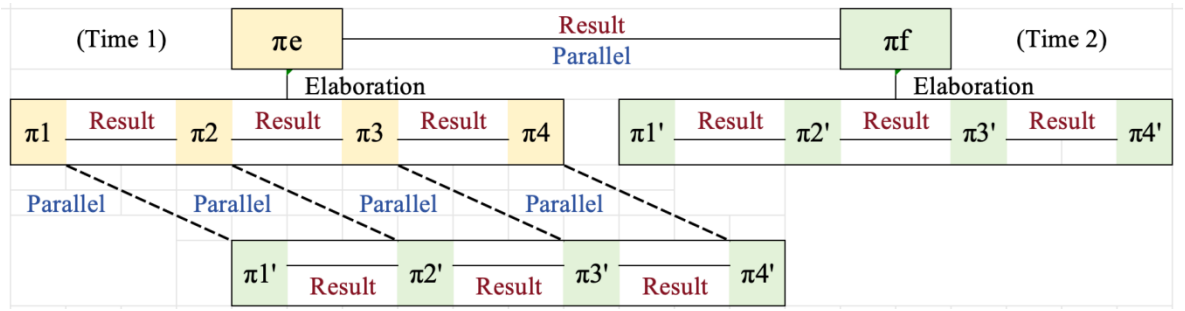


Figure 2: Result Relations and Parallel Relations within Part 3[2]

π1: Shankar's son-in-law was dumped from the Brahmin caste by Harihar.
π2: His marriage with Shankar's daughter became unholy.
π3: The caste of Shankar's family was tarnished.
π4: The marriage of Shankar's nephew became unholy and thus broken.
π1': Kusum was passed off as a Brahmin's daughter.
π2': Kusum and Hemanta formed an unholy marriage.
π3': The caste of Hemanta's family was tarnished.
π4': The marriage of Harihar's daughter would become unholy and thus broken.

Result Relation and Parallel Relation are found within these subordinate DUs. Result Relations can be easily perceived. As for argumentation of Parallel Relations, the shared properties are listed: p1(π1-π1'): a person without Brahmin caste, p2 (π2-π2'): an unholy marriage of a Brahmin and a non-Brahmin, p3 (π3-π3'): the tarnish of a family's caste and p4 (π4-π4'): an unholy thus broken marriage.

Result Relations connect every subordinate DU in the graph closely to another. π1 had a ripple effect on π2, 3 and 4. They altogether formed the origin of hatred which resulted in the action of avenge, where π1' had a similar ripple effect on π2', 3' and 4'. We could accordingly imagine how Kusum's hatred would bring about a new round of avenge if she were actually renounced. In this case, hatred and avenge would move in cycles, which is surprisingly similar to the concept of Karma in Hinduism.

If we focus on the Parallel Relations, a radical common p' can be extracted from of p, p1, p2, p3 and p4, which is 'the caste system of Hinduism'. Everyone involved fell victim to the caste system of

[2] Elaboration: Infer p(a1,a2,...) from the assertions of S1 and S2.
Result: Infer P from the assertion of S1 and Q from the assertion of S2, where normally P → Q.
Parallel: Infer p (a1,a2,...) from the assertion of S1 and p (b1,b2,...) from the assertion of S2, for a common p and similar ai and bi.

DOI: 10.54254/2753-7064/40/20242310

Hinduism (see Figure 3), regardless of which caste they belonged to, and would be caught by the circulation of hatred and revenge like karma, which is ironically a generally acknowledged notion among Hindus.

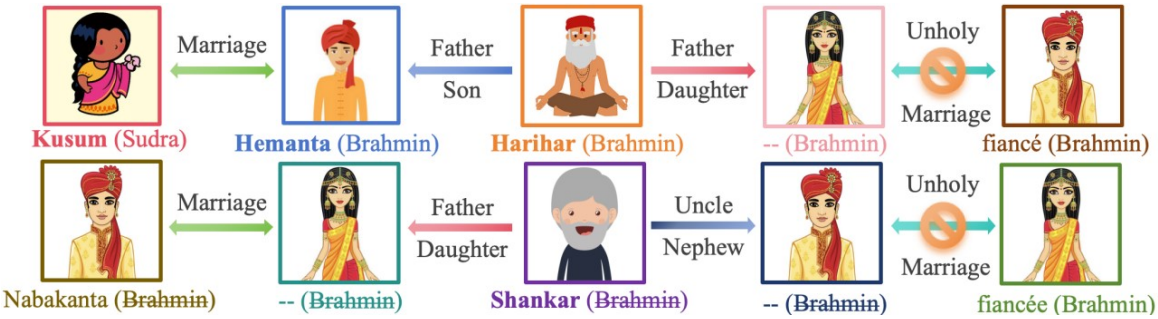


Figure 3: Victims of the Caste System of Hinduism

4. A different Image of Women

Suffering women had been at the centre of the canvas throughout Tagore's more than sixty years of literary activity [12]. Bose argued that he dealt with social evils which oppress women, e.g., arranged marriage, dowry customs and the ban on inter-caste love [17]. His female images are usually longing for literacy, which acts as a key to women's liberation [18]. They are usually endowed with more fascinating and livelier characteristics than those of men [12]. However, dissimilar to other female images, Kusum seems to have nothing to do with resistance or being educated. She remained passive from start to finish, waiting for men to determine her fate.

In this section, the paper explores Tagore's skills and motive in portraying a female character who is absent from half of the narration and seems to lack a sense of struggle. First, a two-day blank in the timeline is noticed. Then, the nightingale which runs through the fiction is discussed as it possibly reveals the psychology of Kusum.

4.1. Blank in the Timeline

Table 2: Blank in the Timeline

Timeline	Day 1		Day 2	Day 3-4	Day 5
Reader's perspective	Part 1	Part 2	Part 3-Dialogue between H&S	?	Part 4
Kusum's perspective			???		

Imaginative engagement facilitates readers' emotional participation in a fictional text [11]. When we look back on the absolute timeline, the continuity is destroyed as Day 3 and 4 are left out. This deliberate blank provokes an imaginative process, inspiring readers to fill in the gap by themselves. They may wonder how Hemanta came to the resolution to renounce his caste instead of his wife. Empathy with Kusum may arise when they recognize that the blank is even larger from Kusum's perspective (see Table 2). Unlike the readers, Kusum was not only confused in Day 3 and 4 but also ignorant of Hemanta's dialogue with Shankar in Part 3. Readers go through an emotional experience in which they feel how suffering Kusum had been when waiting for a judgment by her husband since Day 2 and consequently consider how powerless she was. Tagore used what remained unsaid with deftness to portray an image [17].

DOI: 10.54254/2753-7064/40/20242310

4.2. The Nightingale and Female Aphasia

Tagore addressed women's psychology rather expertly [17]. In addition to the man-made blank in narration, the singing nightingale which appeared throughout the fiction assists in depicting the heroine. The development of the nightingale corresponds with the her experiences: Part 1 opens with '*The song of a sleepless, tireless nightingale filtered through the thick leaves...*' when Kusum newly got married and ends with '*The song of the nightingale floated in with the southern wind, but no one could hear it now.*' she failed to confess her real caste in advance. At the end of Part 2, '*The nightingale had not stopped singing...*' when Kusum confronted her husband's anger and answered his inquiry calmly. Throughout Part 3, she only appeared in the dialogue between two men. The absence of the nightingale echoes that of Kusum. At the end of Part 4, '*No bird was singing.*' when she was waiting in silence for her husband to pronounce the judgment.

The thread of this nightingale functions as the heroine's interior mood swings, bringing readers straight into her heart and discovering how much she suffered. Such an image as Kusum has significance in reflecting women's aphasia and revealing that the social situation, the backward caste system in particular, precipitates innumerable helpless women who are deprived of the ability to strive for themselves due to high-caste men's domination of home and community. Tagore, troubled by misery and injustice caused by the senseless customs of Hindu society, showed sympathy for the victims in his works [12]. While Kusum is kept in silence, the nightingale sings for her.

5. Conclusions

This paper aims to achieve a better understanding of the novel via structural and coherence relation analysis. From the disruption of the timeline, the emphasis on what happened in the past is discovered. Then, the paper traced back to discuss coherence relations within these events. Coexisting Result and Parallel Relations led us to the conclusion that all conflicts in the story originated in the caste system of Hinduism. The blank in the timeline and the nightingale revealed the intricate challenges and conundrums that women have historically faced within the context of Hindu society. Such tragedy as described will be perpetuated as long as people stay under the restraint of the backward caste system. The analysis proved beneficial for a better appreciation of *The Renunciation*. It provides an argumentation of Tagore's firm stand against the caste system and his sympathy for suffering women from aspects different from that of previous scholars.

References

[1] *Sen, N. (2016). Women and Gender in Short Stories by Rabindranath Tagore: An Anthropological Introspection on Kinship and Family. Anthropological Journal of European Cultures, 25(2), 94–115.*
[2] *Maitra, S. (1957). Short Stories of Tagore. Indian Literature, 1(1), 15–26.*
[3] *Deb, I. and Tagore, R. (2008). The Renunciation. Indian Literature, 52(2 (244)), 155–160.*
[4] *Hunter, J. and Thompson, K. (2022). On the Role of Relations and Structure In Discourse Interpretation. In D. Altshuler (Ed.), Linguistics Meets Philosophy(pp. 139–175). chapter, Cambridge.*
[5] *Kehler, A. (2019). Coherence relations. In: Truswell R (ed) The Oxford handbook of event structure. Oxford University Press, Oxford, 583–604.*
[6] *Asher, N. (1993). Reference to abstract objects in discourse. Springer, Dordrecht.*
[7] *Asher, N. and Lascarides, A. (2003). Logics of conversation. Cambridge University Press, Cambridge.*
[8] *Asher, N. and Vieu, L. (2005) Subordinating and coordinating discourse relations. Lingua 115:591–610. https://doi.org/10.1016/j.lingua.2003.09.017*
[9] *Hunter, J., Asher, N. and Lascarides, A. (2018). A formal semantics for situated conversation. Semant Pragmat. https://doi.org/10.3765/sp.11.10*
[10] *Afantenos, S., Asher, N., Benamara, F., Bras, M., Fabre, C., Ho-Dac, L-M., Draoulec, AL., Muller, P., Pery-Woodley, M-P., Prevot, L., Rebeyrolle, J., Tanguy, L., Vergez-Couret, M. and Vieu, L. (2012). An empirical*

DOI: 10.54254/2753-7064/40/20242310

resource for discovering cognitive principles of discourse organisation: the ANNODIS corpus. In: Nicoletta, C., Khalid, C., Thierry, D., Mehmet, UD., Bente, M., Joseph, M., Asuncion, M., Jan, O. and Stelios, P. (eds) Proceedings of the eighth international conference on language resources and evaluation (lREC'12). European Language Resources Association, Istanbul, 2727–3274.

[11] Altshuler, D. and Kim, CS. (2023). Towards a Typology of Narrative Frustration.Topoi. https://doi.org/10.1007/s11245-023-09942-1

[12] Choudhuri, A. D. (1976). Tagore's Short Stories. Indian Literature, 19(5), 72–79.

[13] Tompson, E. (1926). Rabindranath Tagore, Poet and Dramatist. Oxford University Press, Oxford.

[14] Hobbs, J. and Violi, P. (1990). Structuring in Nerval's Sylvie. In: Literature and cognition. CLSI, 121–130.

[15] Jasinskaja, K. and Karagjosova, E. (2020). Rhetorical relations. In Daniel, G., Lisa, M., Cécile, M., Hotze, R. and Zimmermann, TE. (eds) Companion to semantics. Wiley, New York. https://doi.org/10.1002/9781118788516.sem061

[16] Hobbs, J. (1990). Literature and cognition. CSLI, Stanford, CA.

[17] Bose, A. (1983). The Bengali Short Story. Indian Literature, 26(4), 48–65.

[18] Lago, M. M. (1977). Tagore's Liberated Women. Journal of South Asian Literature, 12(3/4), 103–107.

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242263

Exploring the Impact of Gamification on STEM Learning in Education: The Mediating Role of Facilitating Focus

Wanting Su[1,a,*]

[1]*The Chinese University of Hong Kong, Shatin,NT, Hong Kong, China*
a. 17620231151253@stu.xmu.edu.cn
**corresponding author*

Abstract: This study aims to examine the effect of gamification on STEM Learning in education, the mediating role of promotion focus, and the moderating role of teacher guidance. A sample of 385 college students majoring in computer science across different colleges in Jiangsu Province who experienced gamification in their curriculum was surveyed. The data were collected using questionnaires designed to measure gamification in education, STEM Learning outcomes, the level of promotion focus, and the degree of teacher guidance. Confirmatory factor analysis showed good discriminant validity (χ^2 = 596.165, df = 260, χ^2/df = 2.293, RMSEA = 0.056, CFI = 0.922, IFI = 0.924). Positive correlations were found between Gamification Engagement, Facilitative Focus, and STEM Learning in Education (Self-report & Teacher Evaluation). Hypothesis testing indicated gamification's direct effect on STEM Learning (γ=0.814, $p<0.01$), mediation by promotion focus (effect value 0.072, 95% CI [0.002, 0.155]), and moderation by teacher guidance (effect value 0.130, 95% CI [0.074, 0.156]). Gamification directly enhances STEM Learning and can be further optimized through teacher-guided promotion focus. To maximize gamification's impact, teachers should balance it with traditional methods and stimulate positive learning motivation among students. Thus, incorporating gamification, reinforcing teacher guidance, and nurturing a promotion-focused learning environment are key for optimal educational outcomes.

Keywords: gamification, STEM Learning, promotion focus, teacher guidance, learning outcomes.

1. Introduction

The importance and necessity of STEM Learning in Education (SLE) cannot be overstated in today's rapidly evolving global landscape. It has been highlighted by current educational theorists that the value of STEM Learning lies in fostering holistic development and preparing students for the dynamic challenges of the future [1]. Furthermore, it's recognized that SLE equips students with critical competencies like critical thinking, collaboration, and adaptability [2]. Another important aspect of SLE is the instillation of a lifelong learning habit, which can empower students for continuous personal and professional growth [3]. Consequently, SLE's importance as a fundamental element of modern education is widely recognized.

Despite its acknowledged importance, fostering motivation for SLE among students remains a significant challenge. Students' engagement and motivation towards STEM Learning are often lacking [4]. This pressing issue of maintaining consistent enthusiasm for SLE is often observed in

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242263

many educational contexts [5]. There seems to be a disconnection between students' initial interest in SLE and their sustained commitment, a phenomenon that necessitates further examination [6]. Thus, motivating students towards SLE emerges as a critical concern. To tackle this problem, educational theorists and practitioners have turned their attention to gamification. The application of game mechanics in non-game contexts, or gamification, has been indicated to potentially enhance learning motivation [7]. It is posited that gamification can stimulate engagement, fostering an immersive and enjoyable learning experience [8]. The increasing implementation of gamification in various educational contexts, given its ability to engage and motivate learners, is also noted [9]. Therefore, gamification offers a promising solution to the motivation problem in SLE.

Therefore, this study embarks on a journey to elucidate the interplay of gamification, facilitating focus, and teacher guidance in enhancing SLE motivation. In light of the prevailing gaps in existing literature [4, 10], this study is poised to contribute new insights. The focus will be on the mediating role of facilitating focus and the potential moderating effect of teacher guidance in the relationship between gamification and SLE motivation. This examination holds significant implications for education stakeholders, potentially offering novel strategies for fostering SLE motivation.

2. literature review

2.1. The impact of gamification on students' STEM Learning in education

Gamification in education represents the use of game elements and mechanics in non-game contexts to foster learning and engagement. In essence, it embodies the employment of innovative pedagogical approaches to create immersive and interactive learning experiences [11]. It's been posited that gamification can improve motivation and performance among students, setting the ground for fostering STEM Learning in Education (SLE). SLE is rooted in long-term, integrative, and participative learning experiences that contribute to the individual and collective ability to enact sustainable development [12]. Herein, this research delves into the literature that underpins the influence of gamification on students' SLE.

The element of interactivity in gamification is conjectured to stimulate intrinsic motivation for STEM Learning. Interactivity characterizes gamification and cultivates an engaging environment for students to participate actively, promoting learning autonomy[13]. Studies have shown that such autonomy stimulates intrinsic motivation, which is crucial for continuous learning and investment in knowledge [14]. Thus, students participating in a gamified learning environment may not only demonstrate willingness but also display competence in STEM Learning due to their enhanced engagement.

Therefore, the following hypothesis is proposed:

Hypothesis 1: Gamification has a positive impact on students' STEM Learning in Education.

2.2. The mediating role of facilitating focus

Facilitating focus in the educational context, akin to the promotion focus on the regulatory focus theory, refers to a learner's inclination towards growth, progress, and attainment of educational aspirations [15]. As a motivational construct, facilitating focus is likely to mediate the relationship between gamification (a pedagogical method fostering engaging and immersive learning experiences) and SLE (long-term, integrative, and participative learning towards sustainable development)[16].

Gamification encompasses game elements that cater to learners' aspirations and ambitions, thus instigating facilitating focus. Gamified learning environments often incorporate various levels of difficulty, rewards, and leaderboards, aiming not just at achieving a task but also at cultivating personal growth and mastery [17]. These environments foster learners' ideal self, directly stimulating their facilitating focus.

DOI: 10.54254/2753-7064/40/20242263

Gamification can foster a long-term orientation for learning, a central aspect of SLE. The progression mechanisms in gamified learning environments inspire learners to remain committed to their educational goals and stimulate their desire for continuous learning [18]. Thus, such a setting might keep learners engrossed in their academic growth and aspirations, facilitating a focused pursuit of long-term goals.

Gamification can encourage resilience in learning [19]. The challenge-based nature of gamified learning environments demands learners to persist in the face of difficulties, thereby cultivating resilience. This resilience, in turn, helps maintain a productive and sustained learning state, crucial for the pursuit of academic goals and aspirations [20]. Hence, gamification may enhance students' facilitating focus.

Moreover, facilitating focus can further foster SLE by enabling proactive behaviors in learning, improving the learning environment, and encouraging risk-taking [21]. Learners with a facilitating focus are driven by growth and development needs, tending to engage with educational challenges positively. Such focus also triggers learners to strive for improvement and perfection in their learning tasks, prompting them to proactively identify and address academic issues. Further, a higher facilitating focus may make learners more willing to embrace academic risks, necessary for self-directed learning exploration [22]. Thus, considering the potential influence of gamification on facilitating focus and SLE, it's plausible to posit that gamification might promote SLE through enhancing learners' facilitating focus. Therefore, the following hypothesis is proposed:

Hypothesis 2: Facilitating Focus plays a mediating role in the influence of Gamification on STEM Learning in Education.

2.3. Moderating effect of teacher guidance

As per the regulatory focus theory, the facilitating focus, drawn from learners' pursuit of ideal self, is closely associated with personal growth and self-actualization needs [23]. Teacher guidance, akin to transformational leadership in the workplace, can significantly influence students' growth and educational aspirations by providing direction, offering intellectual stimulation, and showing personalized care [24]. Consequently, in contexts where teacher guidance is pronounced, the impact of gamification on facilitating focus can be considerably enhanced [25].

Teacher guidance provides the developmental path for the practice of gamification. In the broader context, teachers guide students towards future developmental trajectories by defining an inclusive vision for learning. This instills a sense of direction, encouraging learners to perceive their learning journey as a career[26]. This guidance helps students navigate conflicts between short-term wins and long-term goals, ensuring they remain committed to their lifelong learning pursuits. Similarly, on a shorter timescale, teachers provide timely feedback on students' progress and areas of improvement, fostering the internalization of gamification's value pursuit of excellence[27]. Therefore, under effective teacher guidance, gamification can promote learners to pursue higher academic goals and integrate their commitment to learning quality into their self-concept. Thus, teacher guidance can create conditions for activating the benefits of gamification, enhancing the transformation of gamification into facilitating focus.

Therefore, the following hypotheses are proposed:

Hypothesis 3: Teacher guidance positively moderates the relationship between gamification and facilitating focus, that is, when teachers display a higher level of guidance, the positive impact of gamification on facilitating focus is stronger.

Hypothesis 4: Teacher guidance positively moderates the mediating effect of facilitating focus on the relationship between gamification and STEM Learning in Education (SLE), that is, when teachers display a higher level of guidance, the mediating effect of facilitating focus on the relationship between gamification and SLE is stronger.

DOI: 10.54254/2753-7064/40/20242263

In summary, based on the analysis, the following research model was constructed (Figure 1).

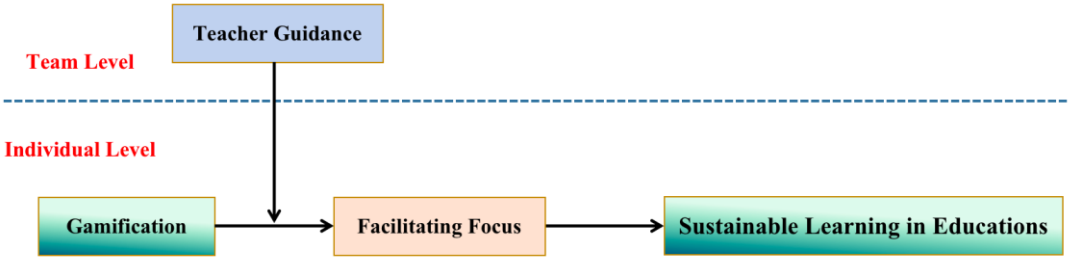


Figure 1: Research Model

3. METHOD

The research subjects of this study are drawn from the academic staff and students of two educational institutions in Jiangsu Province. These institutions mainly focus on advanced pedagogical methods and are known for employing gamification techniques in their curriculum, making them an ideal choice for studying the interaction between teacher guidance, gamification, and STEM Learning in Education (SLE) based on educational settings. After receiving consent from the administrations and academic departments of both institutions, to avoid the potential impact of common method bias, the research team distributed and collected the questionnaires at two different time points, with an interval of one month between each survey.

In the first survey round, students evaluated their engagement with gamification and their teacher's guidance style. Both teachers and students were asked to report their demographic information. In the second round, students assessed their own facilitating focus and perceived SLE, while teachers were asked to evaluate each student's level of academic engagement and achievement. Once the two rounds of surveys were complete, the data was matched using the unique codes provided on the questionnaires. A total of 85 teacher questionnaires and 430 student questionnaires were received. After excluding incomplete questionnaires and those from classes with fewer than 3 students, this study ended up with 75 valid teacher questionnaires and 385 valid student questionnaires. The effective response rate was approximately 83.2%. The effective sample had an average class size of 5.13 students. In terms of teacher samples, males represented 71.33%, and the 31-40 age group represented 67.45%. Regarding student samples, males accounted for 68.45%, with the 16-20 age group representing 54.05%.

4. Results

4.1. Common method bias and confirmatory factor analysis

Considering that this study's data were collected at two time points from multiple sources and that this research have maximized the research design with 12 variables, the first factor explanatory variable stands at 24.06%. Hence, there is no significant problem of common method bias in the data. Furthermore, this study employed confirmatory factor analysis to test the discriminant validity of the six factors included in the model, including Gamification Engagement, Teacher Guidance, Facilitative Focus, Defensive Focus, STEM Learning in Education (Self-report & Teacher Evaluation). The relevant results are presented in Table 1.

As observed in Table 1, compared to other alternative factor models, the original model best fits the data, although this research cannot entirely rule out the presence of common method bias in the data. To address this, the study first conducted a common method bias test on the data based on the Harman single factor method. Through exploratory factor analysis, this research found that the model

DOI: 10.54254/2753-7064/40/20242263

provides the best causal effect when the characteristic root is greater than 1 (χ^2 = 596.165, df = 260, χ^2/df = 2.293, RMSEA = 0.056, CFI = 0.922, IFI = 0.924). This suggests that the variables have good discriminant validity and can undergo further analysis.

Table 1: Confirmatory factor analysis

Model	χ^2	df	Δχ^2 (Δdf)	χ^2/df	RMSEA	CFI	IFI
Original model (A, B, C, D, E, F)	596.165	260	-	2.293	0.056	0.922	0.924
Five-factor model (A, B, C, D, E+F)	1196.817	265	600.652 (5) ***	4.516	0.093	0.785	0.788
Four-factor model (A, B, C+D, E+F)	1268.977	269	672.812 (9) ***	4.717	0.095	0.769	0.772
Three-factor model (A+B, C+D, E+F)	1490.871	272	894.706 (12) ***	5.481	0.105	0.719	0.722
Two-factor model (A+B+C+D, E+F)	2381.294	274	1785.129 (14) ***	8.691	0.137	0.514	0.520
Single factor model (A+B+C+D+E+F)	2830.359	275	2234.194 (15) ***	10.292	0.151	0.411	0.417

Note: A represents Gamification Engagement, B signifies Teacher Guidance, C refers to Facilitative Focus, D stands for Defensive Focus, E indicates STEM Learning in Education (Self-report), F means STEM Learning in Education (Teacher Evaluation), + signifies merger; *** means p<0.01.

4.2. Descriptive statistical analysis

In this research, SPSS22.0 statistical analysis software was utilized to examine the correlation of each variable. The mean, standard deviation, and correlation coefficient of each primary variable and control variable are detailed in Table 2. As indicated in Table 2, Gamification Engagement significantly positively correlates with Facilitative Focus (r=0.219, p<0.01), STEM Learning in Education (Self-report) (r=0.420, p<0.01), and STEM Learning in Education (Teacher Evaluation) (r=0.199, p<0.01), aligning with the direction of the pertinent hypothesis. Simultaneously, Defensive Focus correlates with Gamification Engagement (r=0.245, p<0.02) and Teacher Guidance (r=0.515, p<0.01), necessitating control for its influence.

DOI: 10.54254/2753-7064/40/20242263

Table 2: Mean, standard deviation and correlation coefficient

Category	Mean	Standard Deviation	1	2	3	4	5	6
Team Variable								
Teacher Gender	1.239	0.428						
Teacher Age	3.676	0.526	-0.094					
Team Size	4.820	1.846	-0.195	0.054				
Teacher Guidance	4.020	0.233	-0.161	0.111	-0.172			
Individual Variable								
Student Gender	1.280	0.452						
Student Age	2.781	0.701	0.039					
Gamification	4.025	0.393	-0.039	-0.026				
Facilitative Focus	3.987	0.533	-0.042	-0.048	0.219***			
Defensive Focus	4.040	0.586	-0.031	-0.013	0.245**	0.515***		
STEM Learning in Education (Self-report)	3.993	0.490	-0.011	-0.059	0.420***	0.208****	0.164***	
STEM Learning in Education (Teacher Evaluation)	3.775	0.652	-0.260**	-0.074	0.199***	0.104*	0.021	0.190****

4.3. Hypothesis testing

For this study, this research utilized Mplus7.0 software to create a multilevel linear model to test the main hypotheses. The pertinent results are shown in Table 3. From Models 3, it can be observed that the direct effect of gamification on STEM Learning in education is significant (γ=0.814, $p<0.01$), thus supporting Hypothesis 1.

Further, Table 3 shows that gamification has a significant positive impact on promotion focus (γ=0.345, $p<0.01$); promotion focus, in turn, has a positive impact on STEM Learning in education (γ=0.179, $p<0.05$). This research further utilized Mplus7.0 software to build a multilevel mediation model to test the mediation effect of promotion focus. The relevant results indicate that the effect of promotion focus between gamification and STEM Learning in education is significant (the effect value is 0.072, and the 95% CI is [0.002, 0.155]), thus confirming Hypothesis 2.

DOI: 10.54254/2753-7064/40/20242263

Table 3: Multilevel linear model regression results

Category	Facilitating Focus		Gamification	
	Model 1	Model 2	Model 3	Model 4
Team Variable				
Teacher Gender	-0.006 (0.078)	0.014 (0.075)	-0.025 (0.067)	-0.030 (0.064)
Teacher Age	0.136* (0.072)	0.137* (0.075)	0.082* (0.050)	0.072 (0.050)
Team Size	0.003 (0.020)	0.010 (0.019)	-0.011 (0.013)	-0.009 (0.013)
Teacher Guidance	0.253* (0.154)	0.253* (0.154)		
Individual Variable				
Student Gender	-0.020 (0.070)	0.009 (0.069)	-0.009 (0.049)	0.015 (0.054)
Student Age	-0.017 (0.043)	-0.003 (0.041)	-0.057*(0.033)	-0.051 (0.038)
Gamification	0.345*** (0.106)	-3.592** (1.429)	0.814*** (0.059)	
Teacher Guidance×Gamification		0.196** (0.090)		
Facilitative Focus				0.179** (0.091)
Defensive Focus				0.026 (0.074)
Intercept	3.540*** (0.354)	2.374*** (0.747)	3.954*** (0.222)	3.834*** (0.387)
-2LL	2812.834	2800.48	2637.686	3933.142
AIC	2846.834	2840.481	2675.686	3993.142
BIC	2912.075	2917.235	2748.603	4109.891

Next, this research analyzed the moderating role of teacher guidance between gamification and promotion focus. From Model 2 in Table 3, the interaction between teacher guidance and gamification is significant (γ=0.996, $p<0.05$). In order to represent the moderating effect of teacher guidance more intuitively, this study has included Figure 2. It can be seen from Figure 2 that when teacher guidance is high, gamification has a stronger positive effect on promotion focus (effect value 0.664, $p<0.05$); when teacher guidance is low, gamification has no significant effect on promotion focus (effect value 0.181, $p>0.05$). Therefore, Hypothesis 3 is supported.

DOI: 10.54254/2753-7064/40/20242263

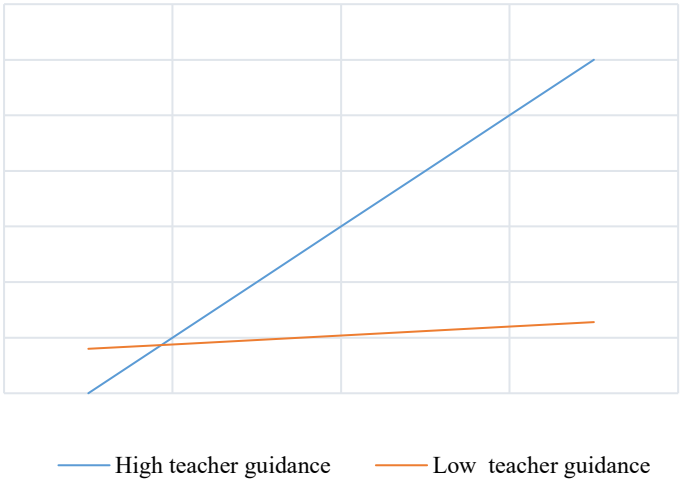


Figure 1: The moderating effect of teacher guidance

Finally, this study examined the moderating effect of teacher guidance on the first stage of the entire pathway based on a mediation model of cross-level moderation (refer to Table 4). From Table 4, the difference effect value between high and low teacher guidance is 0.099, and the 95% CI is [0.006, 0.191], indicating that teacher guidance significantly moderates the relationship between gamification and STEM Learning through promotion focus. When teacher guidance is high, the promotion focus induced by gamification positively affects STEM Learning (the effect value is 0.130, and the 95% CI is [0.074, 0.156]); when teacher guidance is low, the mediating effect of promotion focus is not significant (the effect value is 0.032, and the 95% CI is [-0.046, 0.110]). Therefore, Hypothesis 4 is supported.

Table 4: Cross-level Moderated Mediation Test Results

	First Stage		Second Stage		Two Stage	
Category	**Point Estimate**	**95% CI**	**Point Estimate**	**95% CI**	**Point Estimate**	**95% CI**
Path:	Gamification→ Facilitating Focus → STEM Learning in Education (SLE)					
High Teacher Guidance	0.707***	[0.455,0.959]	0.184**	[0.024,0.344]	0.130**	[0.074,0.156]
Low Teacher Guidance	0.173	[-0.143,0.488]	0.184**	[0.024,0.344]	0.032	[-0.046,0.110]
High-Low Difference	0.534***	[0.154,0.914]			0.099**	[0.006,0.191]

5. Discussion

The positive impact of gamification on STEM Learning indicates that learners experiencing gamified education will be more proactive in their learning and engage in continuous learning activities. This

DOI: 10.54254/2753-7064/40/20242263

suggests that educational institutions and teachers can promote STEM Learning by implementing gamification in their teaching practices.

The pivotal role of teacher guidance in the effectiveness of gamification calls for teachers to balance the use of gamification and traditional teaching methods in their classrooms. Specifically, while teachers should create engaging and interactive learning environments through gamification, they should also provide clear guidance and support to their students, activating the role of gamification in promoting student learning and effectively enhancing student learning outcomes.

Educators should take appropriate measures to translate gamification into learners' positive learning motivation. This study suggests that gamification will positively affect learning behavior through the shaping of a positive learning motivation such as promotion focus. Therefore, teachers should not only focus on implementing gamification but also stimulate learners' motivation through effective measures.

6. Conclusion

Self-report and instructor assessment measures show that gamification improves STEM education. Gamification can help schools create a proactive and engaged learning environment. Gamification's positive link with facilitative focus shows its potential to create a conducive learning environment. Promotion focus is a key mediator between gamification and STEM Learning, supporting a positive association. This research suggests that educators should use gamification strategies and create a promotion-focused environment to maximise STEM learning.

The promotion focus-gamification relationship depends on a teacher's direction. Gamification improves promotion focus with strong teacher leadership, according to the study. This requires a balanced approach where teachers apply gamification tactics and provide clear direction and support to students to maximise STEM learning.

References

[1] *M. F. Zguir, S. Dubis, and M. Koç, "Embedding Education for Sustainable Development (ESD) and SDGs values in curriculum: A comparative review on Qatar, Singapore and New Zealand," Journal of Cleaner Production, vol. 319, p. 128534, 2021.*

[2] *A. Ben-Eliyahu, "Sustainable learning in education," Sustainability (Basel, Switzerland), vol. 13, no. 8, p. 4250, 2021, doi: 10.3390/su13084250.*

[3] *K. Froehle, A. R. Phillips, and H. Murzi, "Lifelong learning is an ethical responsibility of professional engineers: Is school preparing young engineers for lifelong learning?," Journal of Civil Engineering Education, vol. 147, no. 3, p. 02521002, 2021.*

[4] *L.-K. Ng and C.-K. Lo, "Flipped classroom and gamification approach: Its impact on performance and academic commitment on sustainable learning in education," Sustainability, vol. 14, no. 9, p. 5428, 2022.*

[5] *S. W. Kozlowski and B. S. Bell, "Team learning, development, and adaptation," in Work group learning: Psychology Press, 2007, pp. 39-68.*

[6] *C. Chapman, P. Armstrong, A. Harris, D. Muijs, D. Reynolds, and P. Sammons, School effectiveness and improvement research, policy and practice: Challenging the orthodoxy? Routledge, 2012.*

[7] *R. W. M. Mee et al., "A Conceptual Model of Analogue Gamification to Enhance Learners' Motivation and Attitude," International Journal of Language Education, vol. 5, no. 2, pp. 40-50, 2021.*

[8] *A. Marougkas, C. Troussas, A. Krouska, and C. Sgouropoulou, "Virtual Reality in Education: A Review of Learning Theories, Approaches and Methodologies for the Last Decade," Electronics, vol. 12, no. 13, p. 2832, 2023.*

[9] *S. Bennani, A. Maalel, and H. Ben Ghezala, "Adaptive gamification in E-learning: A literature review and future challenges," Computer Applications in Engineering Education, vol. 30, no. 2, pp. 628-642, 2022.*

[10] *S. Bai, K. F. Hew, D. E. Gonda, B. Huang, and X. Liang, "Incorporating fantasy into gamification promotes student learning and quality of online interaction," International Journal of Educational Technology in Higher Education, vol. 19, no. 1, pp. 1-26, 2022.*

[11] *K. W. Lau and P. Y. Lee, "The use of virtual reality for creating unusual environmental stimulation to motivate students to explore creative ideas," Interactive Learning Environments, vol. 23, no. 1, pp. 3-18, 2015.*

[12] *W. Scott and P. Vare, Learning, environment and sustainable development: A history of ideas. Routledge, 2020.*

DOI: 10.54254/2753-7064/40/20242263

[13] A. N. Saleem, N. M. Noori, and F. Ozdamli, "Gamification applications in E-learning: A literature review," Technology, Knowledge and Learning, vol. 27, no. 1, pp. 139-159, 2022.
[14] R. Kusurkar, T. J. Ten Cate, M. Van Asperen, and G. Croiset, "Motivation as an independent and a dependent variable in medical education: a review of the literature," Medical teacher, vol. 33, no. 5, pp. e242-e262, 2011.
[15] M. Papi, A. V. Bondarenko, S. Mansouri, L. Feng, and C. Jiang, "Rethinking L2 motivation research: The 2× 2 model of L2 self-guides," Studies in Second Language Acquisition, vol. 41, no. 2, pp. 337-361, 2019.
[16] M. E. Sousa-Vieira, J. C. López-Ardao, M. Fernández-Veiga, and R. F. Rodríguez-Rubio, "Study of the impact of social learning and gamification methodologies on learning results in higher education," Computer Applications in Engineering Education, vol. 31, no. 1, pp. 131-153, 2023.
[17] C. Dichev, D. Dicheva, G. Angelova, and G. Agre, "From gamification to gameful design and gameful experience in learning," Cybernetics and information technologies, vol. 14, no. 4, pp. 80-100, 2014.
[18] D. Dicheva, K. Irwin, and C. Dichev, "Exploring learners experience of gamified practicing: For learning or for fun?," International Journal of Serious Games, vol. 6, no. 3, pp. 5-21, 2019.
[19] R. Kladchuen and J. Srisomphan, "The synthesis of a model of problem-based learning with the gamification concept to enhance the problem-solving skills for high vocational certificate," International Journal of Emerging Technologies in Learning (Online), vol. 16, no. 14, p. 4, 2021.
[20] S. E. Seibert, M. L. Kraimer, and P. A. Heslin, "Developing career resilience and adaptability," Organizational Dynamics, vol. 45, no. 3, pp. 245-257, 2016.
[21] P. J. Collier and D. L. Morgan, "Community service through facilitating focus groups: The case for a methods-based service-learning course," Teaching Sociology, pp. 185-199, 2002.
[22] S. Wilcox, "Fostering self-directed learning in the university setting," Studies in Higher Education, vol. 21, no. 2, pp. 165-176, 1996.
[23] R. Kark and D. Van Dijk, "Motivation to lead, motivation to follow: The role of the self-regulatory focus in leadership processes," Academy of management review, vol. 32, no. 2, pp. 500-528, 2007.
[24] A. Van Leeuwen and J. Janssen, "A systematic review of teacher guidance during collaborative learning in primary and secondary education," Educational Research Review, vol. 27, pp. 71-89, 2019.
[25] A. C. M. Leung, R. Santhanam, R. C.-W. Kwok, and W. T. Yue, "Could gamification designs enhance online learning through personalization? Lessons from a field experiment," Information Systems Research, vol. 34, no. 1, pp. 27-49, 2023.
[26] A. Bandura, "Perceived self-efficacy in cognitive development and functioning," Educational psychologist, vol. 28, no. 2, pp. 117-148, 1993.
[27] R. Costello, "Gamification Strategies for Retention, Motivation, and Engagement in Higher Education: Emerging Research and Opportunities: Emerging Research and Opportunities," 2020.

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242292

Research on Cultural Consumption from the Perspective of Mental Accounting

Jefferson Tianyu Fang[1,a,*]

[1]*Crean Lutheran High School, 12500 Sand Canyon Ave, Irvine, CA 92618, USA*
a. jeffersonfang23@gmail.com
**corresponding author*

Abstract: Behavioral economics emerged in the late 1970s and early 1980s. Compared to traditional economics, its theory is based on bounded rationality and combines with disciplines like psychology to address the limitations of traditional economic theory, providing more convincing explanations for market phenomena. Behavioral economics covers a wide range of topics, and this paper focuses on the perspective of mental accounting to study cultural consumption. Cultural consumption is the endogenous driving force for the development of the cultural industry. The psychological factors behind cultural consumption are key to influencing consumption decisions. Adopting the mental accounting theory from behavioral economics, residents' cultural consumption mental account consist of three main categories: economic capital account, cultural capital account, and social capital account, as well as six sub-accounts: transaction cost account, sunk cost account, leisure and entertainment account, aesthetic value account, social interaction account, and identity differentiation account. These accounts can effectively explain the influence mechanism between utility changes and cultural consumption behavior decisions. Based on the connotation and mechanism of the cultural consumption mental account theory, formulating various bundled sales strategies, reducing the sunk costs of cultural consumption, and promoting the high-quality development of the cultural industry are important paths to expand residents' cultural consumption. By integrating insights from behavioral economics, this approach can provide more effective solutions to boost cultural consumption and drive the sustainable development of the cultural industry.

Keywords: Mental Accounting, Cultural Consumption, Transaction Utility, Acquisition Utility, Behavioral decision-making.

1. Introduction

Cultural consumption is a social behavioral process through which individuals achieve spiritual pleasure and psychological satisfaction, typically categorized broadly and narrowly. Broadly, cultural consumption encompasses all activities and services related to spiritual and cultural consumption, including aspects such as cultural arts, education, technology, and sports. Narrowly, cultural consumption specifically refers to the consumption of cultural products and services such as literature and art. In recent years, many countries worldwide have been striving to promote cultural consumption among their residents to further drive economic development. However, the factors

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242292

constraining decision-making in cultural consumption behavior remain a topic requiring further research. The concept of mental accounting provides an excellent perspective for addressing this issue.

Thaler first introduced the concept of mental accounting to explain why consumers are influenced by the "sunk cost effect" when making consumption decisions[1]. Tversky and Kahneman further utilized the concept of mental accounting to describe how individuals mentally categorize, encode, evaluate, and budget outcomes, particularly economic outcomes[2]. They noted in 1984 that people tend to evaluate outcomes based on a reference point rather than an absolute level[3]. Thaler formally proposed and developed the mental accounting theory in 1985, suggesting that mental accounting systems often follow a set of underlying psychological rules that contradict economic principles[4]. In 1999, Thaler summarized his research on mental accounting, highlighting how individuals mentally categorize, classify, and evaluate various activities when making decisions. General mental accounting comprises three components: analyzing costs and benefits of activities for decision-making and evaluation, categorizing activities into different mental accounts for income allocation, and balancing time and categorization across accounts. On the other hand, narrow mental accounting refers to psychological accounting behaviors that deviate from traditional economic assumptions, demonstrating that different sources of income are not interchangeable and are allocated to separate mental accounts. For instance, individuals may plan rigorous savings and investment strategies for hard-earned income but adopt a different attitude towards windfall gains. Due to the presence of mental accounting, consumers often exhibit "irrational" consumption behaviors, deviating from the assumption of rational decision-making[5].

Based on previous research, this paper defines the mental accounts individuals establish for anticipated cultural consumption as cultural consumption mental accounts. Cultural consumption mental accounts represent the cognitive behaviors of categorizing, encoding, evaluating, and budgeting when consuming or anticipating cultural products and services. This process involves consumers assessing the utility gains and losses of cultural consumption, forming an independent mental account.

2. Classification and Characteristics of Cultural Consumption Mental Account

In terms of classification, cultural consumption mental accounts generally fall under the category of leisure and recreational spending within expenditure accounts, alongside living expenses, emotional bonding, and personal or family development expenses. Depending on the consumer's target and content of consumption, different mental accounts are established. In more specific consumption situations, consumers further set up corresponding benefit and expenditure accounts for individual cultural consumption occasions, such as expenditure price accounts, time cost accounts during consumption, and pleasure gained from consumption accounts. It is worth noting that setting up cultural consumption mental account is a common practice among consumers, although most individuals tend to prioritize spending money on necessities while controlling their indulgence needs[6]. Therefore, the mental accounts for material consumption are often rigid, while those for cultural consumption are typically flexible, with people usually seeking cultural consumption after fulfilling material consumption needs.

The characteristics of cultural consumption mental account can be described from three perspectives. Firstly, the perception and experience of cultural consumption outcomes are related to cost-benefit considerations, with factors determining the consumer's sense of gain or loss perception being associated with both transaction utility and acquisition utility. For example, when a consumer can purchase concert tickets at a 30% discount, they may perceive the consumption as cost-effective from a transaction utility perspective. If the concert is enjoyable, the acquisition utility is also high. However, if the performance falls short of expectations, the acquisition utility decreases, offsetting the previous transaction utility gain. Secondly, each mental account for cultural consumption has

DOI: 10.54254/2753-7064/40/20242292

distinct and non-substitutable classifications, which may be subject to budgetary constraints or exceed budgetary controls. Cultural consumption by individuals is diverse, allowing for the establishment of multiple mental accounts for different consumption items, each with unique budgets. These accounts are often non-substitutable; for instance, the mental account for travel is distinct from those for activities such as watching movies or buying books, with each having its own budget. However, consumer preferences for specific consumption items may lead to adjustments in account expenditure budgets within the overall spending account. Lastly, the evaluation of cultural consumption mental account is influenced by assessment periods such as daily, weekly, monthly, or yearly evaluations. For instance, if a consumer assesses their mental account during a month when they have taken a trip, they may perceive their cultural consumption expenditure for that month as high, resulting in significant economic loss effects. However, viewing this single trip expenditure within an annual timeframe weakens the expenditure effects of the travel consumption.

3. Composition and Behavioral Mechanism of the Cultural Consumption Mental Account

The differences between cultural consumption and general material consumption result in distinct compositions and categories of mental accounts, with different categories of mental accounts playing varying utilities in different cultural consumption behaviors. The changes in utility thus become the core mechanism influencing decision-making in cultural consumption behavior.

3.1. Composition and Classification of Cultural Consumption Mental Account

A prominent challenge in current financial investment risk management practices within From a broad perspective, cultural consumption mental accounts can be categorized into three types: economic capital account, cultural capital account, and social capital account. Individuals incur economic costs in accordance with market transaction rules during the cultural consumption process, thus necessitating an economic capital account (economic capital refers to tangible wealth that can be used to acquire goods or services). Simultaneously, cultural consumption satisfies individuals' spiritual and cultural needs, providing pleasure, comfort, aesthetic enhancement, and cognitive development through consumption, leading to the existence of a cultural capital account (cultural capital refers to informal interpersonal communication skills, habits, attitudes, language styles, educational qualifications, tastes, and lifestyles). Furthermore, cultural consumption generates significant externalities, offering additional social capital benefits such as making friends, maintaining relationships, and expressing identity. Therefore, consumers typically establish a social capital account (social capital is a collection of actual or potential resources that are closely linked to a persistent network, inseparable from a familiar, recognized, and institutionalized relationship network). For individuals, economic capital represents wealth and purchasing power; cultural capital signifies personal cultivation and is a necessary prerequisite for entertainment and aesthetic appreciation; social capital embodies interpersonal relationships and can bring substantial external benefits. While there may be interconversion among these forms of capital, once one form of capital is transformed into another, it loses its original characteristics and only retains the characteristics of the converted form. Thus, the three types of mental accounts—economic capital, cultural capital, and social capital—have distinct content directions and significances, are strictly differentiated, and are non-substitutable.

Based on the essence of economic capital, cultural capital, and social capital, as well as their main measurement methods, this article subdivides the economic capital account into transaction cost account and sunk cost account, the cultural capital account into leisure and entertainment account and aesthetic value account, and the social capital account into social interaction account and identity

DOI: 10.54254/2753-7064/40/20242292

differentiation account. Economic capital accounts are expenditure-oriented, while cultural capital and social capital accounts are income-oriented.

The transaction cost account in cultural consumption is measured in currency, similar to general consumer mental accounts. In cultural consumption, transaction costs mainly refer to the prices of consumption objects, such as concert tickets and art prices. The establishment of the transaction cost account in cultural consumption originates from consumers' psychological assessment of the value of cultural consumption objects. Because the prices of many cultural products or services are not solely determined by their value, instances of transaction prices deviating from value are common in cultural consumption. For example, the value of an artwork may be perceived differently by individuals based on their artistic interests, resulting in different transaction cost accounts being set up in their minds.

Sunk costs refer to expenses that have been incurred and cannot be recovered regardless of efforts made. Sunk costs are classified into monetary sunk costs and behavioral sunk costs, with behavioral sunk costs referring to the efforts, energy, time, and other inputs made by consumers. Cultural consumption involves both monetary and behavioral sunk costs. For example, in attending a performance, monetary sunk costs mainly include ticket costs and travel expenses, while behavioral sunk costs encompass activities such as gathering performance information, creating support materials, participating in on-site activities, and attending the performance, incurring energy and time costs.

Regarding the leisure and entertainment account, leisure is a form of life that seeks psychological relaxation by escaping external pressures. The fundamental function of cultural consumption is to provide mental pleasure, relaxation, and emotional relief through the consumption of cultural products, enjoyment of cultural services, experiences, and participation, meeting the basic pursuit of consumers engaging in cultural consumption.

In terms of the aesthetic value account, aesthetics is a spiritual practice aimed at satisfying individuals' cognitive, appreciation, and educational needs for beauty. It involves an interactive process between the aesthetic subject and object. Cultural consumption objects often embody cultural and artistic beauty, allowing consumers to derive aesthetic value through the consumption process. The aesthetic value account can be further divided into sub-accounts such as aesthetic cognition, aesthetic education, and aesthetic construction.

Regarding the social interaction account, cultural consumption serves as a special form of social interaction activity, expanding social networks, strengthening interpersonal relationships, and gaining recognition from others. Therefore, especially in collective cultural consumption, individuals may establish a social interaction account for engaging in social interactions, emotional connections, and relationship expansions. For instance, inviting friends or hosting guests to attend exhibitions, performances, joining specific book clubs, ticket groups, or making new friends while visiting museums, exhibition halls, etc.

In terms of the identity differentiation account, consumer goods consumption is not only for their intrinsic value but also for the symbols and meanings they reflect. In other words, consumption has symbolic significance. Cultural consumption is a typical form of symbolic consumption, where different cultural tastes represent distinct identity symbols, leading to identity differentiation among consumer groups. Individuals may establish an identity differentiation account in their minds to maintain identity conformity within a group.

3.2. Behavioral Decision-making Based on Cultural Consumption Mental Account

The fundamental factor influencing behavioral decision-making in cultural consumption is the psychological utility perceived by consumers. Utility refers to the level of satisfaction consumers experience when consuming goods, and in cultural consumption, individuals typically perceive two types of utility: Transaction Utility and Acquisition Utility. Transaction Utility evaluates the value of

DOI: 10.54254/2753-7064/40/20242292

a transaction, comparing the payment price with the consumer's expected price for the item, representing the difference between the expected price and the transaction price in monetary terms. The expected price is derived from the evaluation of the utility of past cultural consumption objects or a fuzzy comprehensive evaluation based on information about the initial consumption object. Acquisition Utility, akin to consumer surplus in traditional economics, is the utility gained from consumption minus the costs that must be foregone, representing the difference between the cultural capital utility, social capital utility, and economic capital utility gained from consumption. It cannot be fully quantified in monetary terms but is more of a psychological utility calculated based on the gains and losses in mental accounting rules.

There are three mechanisms through which the utility changes in cultural consumption mental accounts influence behavioral decision-making in cultural consumption. Firstly, Transaction Utility alone can affect decision-making in cultural consumption, where consumers may not consider the utility gained and perceive the cultural consumption as a good deal compared to previous experiences. Secondly, Acquisition Utility alone can influence decision-making, where even if the price is high, the utility gained from consumption is perceived as significant. Thirdly, consumers may consider both Transaction Utility and Acquisition Utility in deciding on cultural consumption behavior, which is the most common scenario.

Transaction Utility plays a determining role in the following situations: when the expected price is higher than the transaction price, consumers are more likely to make a purchase decision, feeling that the purchase is worthwhile; when the expected price is lower than the transaction price, consumers may perceive the item as too expensive and may refrain from making a purchase. Positive and negative Transaction Utility correspond to two market situations: some items quickly sell out due to consumers seeing it as a good deal, while others may remain unsold because consumers perceive negative transaction utility and are unwilling to buy.

Acquisition Utility plays a determining role in the following scenarios: when the loss is greater than the gain, attention is usually focused on the gains in cultural and social capital to reduce the pain of loss; when the loss is smaller than the gain, consumers may overlook the pain of loss and continue consumption due to a positive overall utility; when both the loss and gain are significant, but the gain exceeds the loss, consumers still consider the consumption valuable but may not engage in similar consumption again. Generally, when positive utility is less than negative utility, consumers perceive the consumption as not worthwhile and may reduce similar consumption behaviors; when positive utility exceeds negative utility, consumers consider the consumption as valuable and may increase similar consumption.

Most of the time, cultural consumers make decisions based on the combined effects of Transaction Utility and Acquisition Utility, reflecting the overall utility of consumption. Different preferences among cultural consumers lead to varying consumption decisions. For enthusiastic fans of cultural arts, Transaction Utility has minimal impact, as long as the Acquisition Utility is positive, they will make a purchase decision. For ordinary consumers, both Transaction Utility and Acquisition Utility are equally important, and a high level of either utility can lead to a purchase decision. Unconscious potential consumers are less influenced by Acquisition Utility but require a high level of Transaction Utility to prompt consumption.

4. Policy Recommendations to Promote Residents' Cultural Consumption Based on Mental Accounting Theory

4.1. Formulating Bundled Sales Strategies

Based on the differential utility perceptions, adopting diversified token payment methods such as consumption vouchers and discount cards to formulate bundled sales strategies can be an effective

DOI: 10.54254/2753-7064/40/20242292

approach. Within the mental accounting structure, individuals often categorize their wages and other income into the "regular income from work" account, while placing coupons, discount cards, and similar items into the "non-routine additional income" account. Due to the non-substitutability between these accounts, the perceived transaction utility experienced by residents when using income from these two accounts for consumption differs. When spending from the regular wage income account, the perception is that the losses outweigh the gains; however, when spending from the non-routine additional income account, the perception is that the gains outweigh the losses. Therefore, providing residents with coupons, discount cards, and other token payment methods on the consumption side can reduce the sense of cash payment outlay for consumers, effectively enhancing transaction utility.

4.2. Reducing Sunk Cost

In addition to transaction prices, the time costs, transportation costs, and other sunk costs of consumption are also significant factors influencing consumer decisions. Therefore, it is necessary to utilize modern technological tools to enhance transaction platforms, standardize transaction processes, and improve transaction service levels. Effective time management, spatial management, and service tracking throughout the consumption process should be implemented to reduce sunk costs in transactions and consumption, minimize economic capital loss, mitigate negative effects of consumption, and enhance the perceived transaction utility in cultural consumption.

4.3. Promoting High-Quality Development of the Cultural Industry

Promoting high-quality development of the cultural industry involves offering high-quality products and services to enhance consumers' cultural capital utility. Driving the high-quality development of the cultural industry by supplying high-quality, personalized, and diverse cultural products and services to enhance residents' cultural capital utility in leisure, entertainment, and artistic aesthetics is the foundation for promoting cultural consumption. The high-quality development of the cultural industry is a systematic endeavor that requires the establishment of a synergistic innovation ecosystem for cultural industry development and the core competitiveness of the cultural industry, encompassing policy safeguards, industrial structure, regional layout, growth patterns, innovative mechanisms, cultural development environment, and cultural social ecology.

4.4. Enhancing the Added Value of Cultural Products and Services

In a consumer society, enhancing the value-added of cultural products and services is beneficial for consumers to acquire social capital utility. The added value of products and services in consumption society imbues consumers with identity significance and symbolic value, as individuals often showcase distinctiveness from others or groups through their choice of consumption behaviors. As high-value-added consumer goods, cultural products and services should pay more attention to the social capital benefits behind consumption. Therefore, while promoting the high-quality development of the cultural industry, there should also be a greater emphasis on building product brands and value-added services. This includes storytelling brand narratives, increasing product technological content, highlighting uniqueness among similar products; creating branded products to enhance the symbolic and symbolic value of products, and increasing cultural added value.

5. Conclusion

This study focuses on cultural consumption from the perspective of mental accounting, drawing insights from relevant theories. Cultural consumption is a unique category within consumer behavior,

characterized by psychological accounts that share similarities with general consumer accounts while also possessing distinct characteristics. Residents' mental accounts for cultural consumption consist of three main categories—economic capital account, cultural capital account, and social capital account—along with six sub-accounts: transaction cost account, sunk cost account, leisure and entertainment account, aesthetic value account, social interaction account, and identity differentiation account. These accounts effectively explain the mechanisms influencing changes in utility and decision-making in cultural consumption behavior. Based on the theoretical implications and mechanisms of cultural consumption mental accounts, developing multiple bundled sales strategies to reduce the sunk costs of cultural consumption and promote high-quality development of the cultural industry represents a key approach to expanding residents' cultural consumption.

References

[1] *Thaler, R. (1980). Toward a positive theory of consumer choice. Journal of Economic Behavior & Organization, 1(1), 39–60. https://doi.org/10.1016/0167-2681(80)90051-7.*

[2] *Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. Science, 211(4481), 453–458. https://doi.org/10.1126/science.7455683.*

[3] *Kahneman, D., & Tversky, A. (1984). Choices, values, and frames. American Psychologist, 39(4), 341-350.*

[4] *Thaler, R. (1985). Mental accounting and consumer choice. Marketing Science, 4(3), 199–214. https://doi.org/10.1287/mksc.4.3.199*

[5] *Thaler, R.H. (1999) 'Mental accounting matters', Journal of Behavioral Decision Making, 12(3), pp. 183–206. doi:10.1002/(sici)1099-0771(199909)12:3<183::aid-bdm318>3.0.co;2-f.*

[6] *Kivetz, R. and Simonson, I. (2002) 'Self-control for the righteous: Toward a theory of precommitment to indulgence', Journal of Consumer Research, 29(2), pp. 199–217. doi:10.1086/341571.*

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242349

Analysis of the Main Contradictions and Solutions in Achieving Educational Equity under China's "Double Reduction" Policy

Xinru Liu[1,a,*]

[1]*Department of Educational Technology, Qingdao University, Qingdao, China*
a. 1913880663@qq.com
**corresponding author*

Abstract: This article aims to analyze the obstacles encountered by Chinese society in implementing the "double reduction" policy and the main contradictions in achieving educational equity, explore the new contradictions and problems brought by the "double reduction" policy to the education sector, and provide corresponding countermeasures for Chinese society, communities, families, and schools. It is hoped that this can improve the "double reduction" policy while eradicating the remaining irrationality in the Chinese education sector, enhance the level and quality of Chinese education, and develop an educational powerhouse. A comprehensive review was conducted through literature review, combined with knowledge in the fields of educational equity, educational policies, and comparative education. This article explores the four major contradictions behind the "double reduction policy" and proposes four guiding suggestions: balancing educational resources, optimizing the rationality of education and training, clarifying the responsibilities of families and schools, establishing a communication mechanism between families and schools, implementing a comprehensive evaluation system, strengthening the enrollment form of higher education, enhancing community resources, and improving community after-school services.

Keywords: "double reduction" policy, compulsory education stage, education equity.

1. Introduction

1.1. Research background

The "double reduction" policy, namely the "Opinions on Further Reducing the Homework Burden and Extracurricular Training Burden of Students in Compulsory Education Stage", is an important educational reform measure proposed in the current educational background [1]. The introduction of this policy has reduced students' homework and extracurricular training burdens, aimed at promoting educational equity, improving education quality, alleviating parental anxiety, and regulating the education market.

However, the implementation of the "double reduction" policy is currently not optimistic, and the desire to achieve educational equity is slowly being promoted due to factors such as hidden off campus training, differences in the quality of teachers in different schools, differences in the quality

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242349

of off campus services, and differences in regional implementation efforts [2]. Moreover, if the "double reduction" policy cannot be implemented reasonably and effectively, it may even create and exacerbate more educational inequality. The issue of educational equity today has entered an era of both opportunities and challenges under the guidance of the "double reduction" policy.

Therefore, researchers need to conduct an in-depth and effective exploration of the "double reduction" policy, identify the reasons for new educational inequality issues and implementation difficulties, and propose practical and feasible strategies for the implementation of China's "double reduction" policy and the resolution of educational inequality issues. If implementation strategies can be found, it may even eradicate many deep-rooted educational inequalities in China.

1.2. Research meaning

The significance of this study is mainly divided into theoretical significance and practical significance

1.2.1. theoretical significance

At the theoretical level, this study will enrich and improve the theoretical system of implementing the "double reduction" policy, supplement and revise existing theories, and fill the current research gap. By delving into the subjective and objective factors that affect the implementation of the "double reduction" policy, analyzing the various contradictions hidden behind it, this will better clarify the reasons for the educational inequality and implementation difficulties that exist and arise in China, and provide a solid theoretical foundation for subsequent implementation.

1.2.2. Practical significance

At the practical level, this study will propose more scientific and effective solutions to the problems existing in the implementation of the current "double reduction" policy, providing guidance for practical applications. This study has identified the obstacles encountered in the implementation of the "double reduction" policy and proposed solutions to promote more positive, reasonable, and effective policy implementation, thereby enhancing its value and application effectiveness in social practice.

2. Literature review

2.1. Current Status and Development Trends of Foreign Research

Since the 1990s, research on reducing academic workload in the United States has been focused on the relationship between the amount of homework and students' academic performance, and has concluded that excessive homework can have a negative impact on students' academic performance [3].

There are various views abroad on China's "double reduction" policy, but overall, most opinions believe that this policy has positive significance. Some analysts believe that China's "double reduction" policy aims to reduce students' homework and extracurricular training burdens, which protects students' rights, helps alleviate educational anxiety, and promotes educational equity and sustainable development [4]. Moreover, it plays an important role in regulating the education and training market, preventing excessive capital intervention, and ensuring the physical and mental health of students.

In addition, some viewpoints suggest that the "double reduction" policy can help reduce the cost of raising children, which may encourage childbirth. In the long run, this may have a positive impact on China's economic growth and social well-being. However, some argue that the implementation of

DOI: 10.54254/2753-7064/40/20242349

policies needs to take into account various factors, including parents' educational expectations, the quality of education in schools, and so on.

2.2. Current Status and Development Trends of Domestic Research

The implementation of the current "double reduction" policy has created a great contradiction with the problems left by the old system, and has triggered new challenges to educational equity. Domestic scholars have conducted extensive research on the practical process of the "double reduction" policy, identifying many difficulties and analyzing the reasons. This is the problem of hidden variation in subject based extracurricular training due to the overlapping effects of multiple factors; The existing education gap is an important cause of the widening gap in the quality of after-school services and teaching quality; The deviation in the implementation of the "double reduction" policy further exacerbates the gap in the quality of after-school services and teaching quality [5]. In terms of policy implementation, scholars Liang Jun and Han Hongfeng believe that the practice of the "double reduction" policy has encountered difficulties in implementation, supervision, and assessment, leading to the falsification of fairness in the starting point, process, and outcome of compulsory education [2], and the promotion of the "double reduction" policy has a single form and insufficient consideration of regional differences [6]. At the same time, the purpose of "double reduction" is to alleviate parental anxiety, but according to the research of scholars such as Zhu Liwen, because parents have high expectations for their children's learning, they also have high expectations for the implementation of "double reduction". However, the satisfaction with academic workload, teaching activities, and after-school services is generally average, which makes it difficult to alleviate the burden on children. However, children in compulsory education generally face problems such as generalized anxiety and implicit injustice [7-8]. Therefore, it can be seen that families, schools, and communities in China have not found a reasonable path to achieve after-school services, and have not formed a reasonable "home school community" integrated service, which has not effectively alleviated parents' anxiety about academic pressure. Secondly, another major purpose of the "double reduction" policy is to eliminate extracurricular tutoring institutions, but these institutions greatly increase the difficulty of elimination by making training invisible in forms such as "one-on-one tutoring" and "live in teachers".

Therefore, China urgently needs to accurately implement the implementation standards of the "double reduction" policy, strictly regulate the entire process of policy implementation, supervision, and management, and promote the rational supply of educational resources. Innovate the assessment system for the "double reduction" policy and improve efficiency. The following is the path suggestions proposed by scholars based on the survey: Chen Yanping and Zhao Qianqian proposed to strengthen the main battlefield of school education, deepen the governance of off campus training institutions, handle the relationship between on campus and off campus education, and build a good educational ecology to solve the current education chaos [9]. Secondly, scholars such as Su Jinfeng believe that for county-level administrative regions, it is necessary to clarify the various obstacles that the "double reduction" policy may encounter in the implementation process, and then work together with the government, society, and schools to promote educational equity. Due to the small administrative area and economic development differences at the county level, the number of schools is controllable, and most schools are in the compulsory education stage. The government and education management departments have less difficulty in coordinating policy guidance, school investment, teacher allocation, resource integration, education supervision, and other aspects, making it relatively easy to achieve educational equity [10]. Secondly, in the face of the significant urban-rural gap, rural schools need to gradually improve the salary system for teachers' after-school services, strengthen the construction of rural teaching staff, and build a shared platform for after-school services [11-12]. Thirdly, schools and communities should not only implement the "double reduction"

DOI: 10.54254/2753-7064/40/20242349

policy, but also prevent it from bringing new unfair issues to family education. The community should provide more social practice services for students, enrich extracurricular activities mainly based on schools, and implement a funding guarantee system to further enhance students' dominant position in education and promote educational equity in families [13-18].

2.3. Summary

Chinese scholars have conducted an in-depth analysis of the problems encountered during the implementation of the "double reduction" policy. Overall, there are some challenges and difficulties in the rise of invisible off campus training, the implementation of regulatory assessment processes, the quality of after-school services, teaching quality, and regional implementation. This is due to the complexity and diversity of early education issues in China. Moreover, in terms of implementation pathways, scholars have focused on the scope of families, schools, and society.

However, there are still some unresolved difficulties brought about by the "double reduction" policy.

3. The contradictions encountered by the "double reduction" policy in achieving educational equity

3.1. The contradiction of imbalanced supply and demand in educational tutoring

According to the policy of "double reduction", various regions in China have gradually reduced the number of educational and training institutions in various forms such as online and offline. However, based on field investigations and literature searches, it is clear that the form of educational and training institutions is undergoing changes. For example, many institutions have shifted to underground models, offering one-on-one tutoring and home-based tutoring; It is not uncommon for retired teachers to engage in private tutoring activities. This reflects the strong demand of parents for after-school education and training, which has been refuted by current policies, resulting in a large number of underground tutoring. And the teaching staff and standardization level of these underground tutoring institutions are far inferior to those of large regulated tutoring institutions. In addition, the "double reduction" policy places the focus of governance on off campus training, "comprehensively regulating off campus training behavior," and "strictly controlling excessive capital inflows into training institutions," with the aim of blocking differentiated education related to family capital provided by the off-campus training market from the source and eliminating the unfairness caused by off-campus training [3]. However, there are differences in educational resources, quality, and level between regions, and this phenomenon is particularly evident in China. The software and hardware conditions of schools in the same district or city can even vary greatly. Therefore, the demand of parents and students for extracurricular training institutions is due to the uneven allocation of existing educational resources in schools, and the adoption of training is also aimed at providing students with more "fair" educational resources through private channels. Therefore, due to the greater supply-demand imbalance caused by the "one size fits all" approach towards large training institutions, I believe it will lead to greater educational inequality.

3.2. The contradiction between the division of responsibilities for home school co education

The concept and practice of family school cooperation in China began in the 1950s and 1960s. On January 1, 2022, the "Law of the People's Republic of China on the Promotion of Family Education" was officially implemented, aiming to build a family education service system of "family responsibility, state support, and social coordination", promote the continuous development of family education, and fully demonstrate the importance that the country attaches to family education [19].

DOI: 10.54254/2753-7064/40/20242349

But so far, there is still no complete theoretical system to divide the responsibilities and obligations of parents and schools in student learning. The implementation of the "double reduction" policy not only reduces students' after-school learning pressure, but also inevitably opens up a new stage of home school co-education, and the problems of home school cooperation have gradually emerged during this period.

Firstly, there is a lack of clear sense of responsibility between parents and schools. Some parents believe that education is the responsibility of the school and shift the blame onto the school and teachers. Therefore, most home school exchanges are centered around students' academic performance, and parents often act as followers or even trainees, failing to reflect their dominant position [20]. As a result, the efficiency of home school co-education is low. However, teachers also lack a clear understanding of home school cooperation. The relationship between parents and schools should be a partnership, and both parties need to regularly understand and supplement each other's learning and living situations, rather than one party taking the lead. Teachers' understanding of home school co-education is not profound enough, and they only focus on students' exam scores. Only when students' academic performance declines or behavior problems are revealed, do parents practice discussing solutions instead of observing, discovering, and correcting them early. This not only delays the normal development of students, but also pushes the responsibility between parents and schools.

Secondly, the form of home school cooperation is superficial. At present, the forms of home school cooperation are still limited to parent open days, parent meetings, family committees, etc. Most of these are organized by schools for parents so they can come into the campus to observe and report on teaching achievements, without fully utilizing the main role of parents. The content of the parent teacher conference also only briefly evaluates the students' current situation around grades, discipline, and other aspects, and cannot let parents know the students' daily school status, mostly in a superficial form.

3.3. The contradiction between the "score only theory" and further education

The "double reduction" policy aims to alleviate the contradiction between educating people and entering a higher school faced by primary and secondary school students by addressing their homework burden and extracurricular training. But China's talent selection system has become deeply rooted, although a comprehensive evaluation system is now widely implemented, aiming to assess students' quality through multi-dimensional "morality, intelligence, physical fitness, aesthetics, and labor". But education and exams are parallel and complementary, and once the importance of exam scores is overly emphasized, it will stimulate the "score only" theory. When the evaluation based solely on scores becomes the main basis and standard for local education administrative departments to showcase their achievements, schools to gain fame and benefits, and teachers to be promoted, the main contradiction between promoting students' comprehensive development through quality education and improving students' grades through "exam-oriented education" will become apparent [21]. Therefore, if Chinese government only try to alleviate the deficiencies in the enrollment system by implementing policies, it can only be said to be a drop in the bucket, and it will actually backfire, making it difficult for students, parents, and teachers who truly comply with the "double reduction" policy to advance to higher education.

At the same time, Chinese parents have a significant misunderstanding and bias towards vocational education, and do not believe that vocational and technical colleges are a "dignified" path to further education. Therefore, it further promotes the "score based" approach, allowing students to "internalize" and obtain better distribution of educational resources in the eyes of parents.

DOI: 10.54254/2753-7064/40/20242349

3.4. The contradiction between community education resources and user groups

At present, the country attaches great importance to community education resources. The cultural and sports facilities in various communities in cities are complete, and many adults and left behind elderly people frequently use them, which can basically achieve the full utilization of resources. But the equipment, books, and activities for primary and secondary schools are not yet mature enough. Many community libraries are only open during student classes and not open during holidays and weekends, making it difficult for teenagers to share this high-quality public resource. Especially in third - and fourth tier cities, the phenomenon of idle resources is particularly evident. It is precisely because parents do not recognize or trust community education resources that more idle resources have emerged. At the same time, the situation in rural areas is even more pessimistic. Since the late 1990s, small-scale schools in rural areas have disappeared sharply. From 2000 to 2010, an average of 3 junior high schools, 63 primary schools, and 30 teaching points disappeared every day in rural areas across the country [22]. Rural primary schools and communities lack independent activity rooms, making it difficult to provide basic after-school services in the community.

4. Solution measures

4.1. Balance school teaching resources and optimize education and training reasonably

The Chinese government should vigorously support the education conditions in poverty-stricken areas, balance the teaching resources of schools between regions, and reduce the teaching gap. Not only should the teacher responsibility system be regularly promoted to encourage normal students and teachers to go to poverty-stricken areas to support teaching, but also by improving the welfare benefits of teachers in poverty-stricken areas, urban teachers can be attracted to flow to rural areas. Secondly, more financial support should be provided to poverty-stricken areas, and high-tech and intelligent devices should be introduced into impoverished rural campuses. Narrowing the gap through online courses, online classrooms, and other means, allowing students in impoverished areas to access more advanced teaching methods and content.

In terms of the control of disciplinary education and training institutions, government departments should actively listen to the opinions of the institutions, conduct background checks, and pay attention to the needs of parents before completely banning them. While complying with policy factors, it is also necessary to strike a balance between educational equity and educational demand, and redefine a reasonable and compliant educational standard. Different regions should flexibly implement policies based on their actual situations.

4.2. Establish a communication mechanism between home and school, clarify the responsibilities of home school education

Teachers should provide timely feedback to parents on students' learning status, learning tasks, etc. within the school, so that both parents and schools can always pay attention to students and put them at the center. It can also help parents understand the daily teaching content of teachers, forming a positive and mutually understanding relationship. At the same time, parents should also provide feedback on their students' homework and extracurricular activities after class, in order to form a closed loop and establish an effective communication mechanism between home and school.

The division of responsibilities for home school education can be organically combined with the communication mechanism between home and school. Parents, teachers, and schools should discuss and divide the responsibility system together, so that responsibilities are clearly and finely implemented to each party, in order to form a unified co-education system.

DOI: 10.54254/2753-7064/40/20242349

4.3. Implement the comprehensive evaluation system and enrich the forms of enrollment for further education

Although the examination system of middle and high school entrance exams has been deeply rooted in China, governments should gradually implement a comprehensive quality evaluation system, so that the comprehensive evaluation system runs through the learning evaluation process of students and occupies a certain percentage in the enrollment of students for further education. Parents, teachers, schools, and society should not only focus on students' final exam scores, but also pay attention to their growth process. Relevant policy researchers can first conduct comprehensive quality enrollment pilot programs in schools and universities with relatively complete comprehensive quality evaluations, and through evaluation, identify a fair and just enrollment form that can balance process education without losing integrity.

4.4. Enrich community education resources and improve after-school services in the community

After the implementation of the "double reduction" policy, communities should also strengthen their position as a major subject in education. Firstly, it is necessary to continuously improve the cultural and sports equipment in the community, especially by supplementing recommended reading books for compulsory education, creating a student after-school service center, and providing students with places for self-study, reading, and activities after class. Secondly, it is possible to establish good connections with nearby schools, preferably forming a "one-stop" service, making full use of the ample extracurricular time brought by the "double reduction" policy to enrich students' mental and experiential activities such as extracurricular practice, and cooperating with parents' off work time to allow students to safely and fully spend their after-school time. Finally, society should make good use of the publicity role of the community, expand the importance of promoting the "family school community", and encourage schools and parents to actively cooperate.

5. Conclusion

At present, it is the golden period for the implementation of the "double reduction" policy, and related issues and contradictions have emerged one after another. If the Chinese government can seize this opportunity for reform, it will have the chance to eliminate the unreasonable and unfair problems that still exist in the education system. Therefore, governments must attach importance to this policy change, balance educational resources between different regions, and tilt towards remote areas. Urgently promote intelligent teaching systems and software, improve the quality of school teaching, and narrow the education gap. Secondly, schools should take the opportunity to clarify the role and status of the home school community in the growth process of students, clarify responsibilities and obligations, and promote the improvement and implementation of relevant laws and regulations on family education. Teachers should also improve their teaching level and educational literacy, actively communicate and coordinate with parents, and innovate new forms of home school co-education. The community should play its due role in promoting and practicing, encouraging students to engage in social practice while also providing comfortable and sufficient activity rooms for students to study and rest. Finally, in response to the problems of "internal competition" and "anxiety" brought about by China's original enrollment system, the admission examination office should not act too hastily, as it is easy for people to take shortcuts and take advantage of opportunities. Therefore, it is possible to gradually promote and modify the rules through pilot projects and other means, in order to form a comprehensive education enrollment system that is most in line with China's educational situation and combined with comprehensive quality evaluation.

DOI: 10.54254/2753-7064/40/20242349

References

[1] Zhou Hongyu&Qi Yanlei (2022). Implementation of the "Double Reduction" Policy: Focus, Difficulties, and Suggestions. Journal of Xinjiang Normal University (Philosophy and Social Sciences Edition) (01), 69-78. doi: 10.14100/j.cnki. 65-1039/g4.20211022.001

[2] Liang Jun, Han Hongfeng. The Value and Practical Path of Educational Equity in the "Double Reduction" Policy [J]. Modern Basic Education Research, 2023, 52 (04): 51-57

[3] Gao Shan (2024). Master's thesis on the practice and policy optimization of "double reduction" in educational an d training institutions (Shandong Normal University) Master's degree https://link.cnki.net/doi/10.27280/d.cnki.gsd su.2024.001213 doi:10.27280/d.cnki.gsdsu.2024.001213.

[4] Jiashan Weng (2024).How Can Policy Enactment Help Us to Understand the Influence of the Implementation of "Double Reduction" Policy on Chinese School Teachers in Compulsory Education? Creative Education (06),1210-1222

[5] Fu Weidong, Guo Sanwei. The implementation of the "double reduction" policy and new educational inequality: based on a survey of 30 counties (cities, districts) in 6 provinces [J]. Modern Education Management, 2024, (04): 42-51. DOI: 10.16697/6.1674-5485.2024.04.005

[6] Xue Eryong, Li Jian, Liu Chang Public opinion monitoring, key issues, and path adjustment in the implementation of the "double reduction" policy [J]. China Electronics Education, 2022, (04): 16-25

[7] Zhu Liwen Research on Parental Satisfaction with Compulsory Education under the Background of "Double Reduction" [D]. Hefei Normal University, 2023. DOI: 10.27829/d.cnki.ghfsy.2023.000172

[8] Wang Xiaoli, Wu Mengyan. The dilemma and solution of children's better life under the interlocking structure of "double reduction" and "involution" [J]. Basic Education Reference, 2024, (04): 62-72

[9] Chen Yanping&Zhao Qianqian (2024). The solution to the internalization of compulsory education through the "double reduction" policy. Journal of Qingyuan Vocational and Technical College (01), 12-17

[10] Su Jinfeng, Li Yuan, Bai Xiumei Research on the Path to Achieving Equity in County Compulsory Education under the Background of "Double Reduction" [J]. Journal of Jiamusi Vocational College, 2023, 39 (04): 49-51

[11] Xu Fenghua, Ma Xiang Post school services in rural schools under the "double reduction" policy: significance, difficulties, and optimization paths [J]. Contemporary Education Forum, 2023, (04): 98-107. DOI: 0.13694/j.cnki.ddjylt.20230710.002

[12] Bai Xue, Li Guang, Wang Aoxuan. Deviation and governance of after-school service policies in rural schools [J]. Education Academic Monthly, 2022, (08): 94-102. DOI: 10.16477/j.cnki. issn1674-2311.2022.08.004

[13] Zhang Wenwen, Li Ting, Chen Ran. Can after-school services contribute to high-quality and fair education? Progress and insights from causal inference research abroad. Journal of Modern Education, 2023, (04): 26-35

[14] Hao Wenwu Efforts should be made to promote equity in family education through the "double reduction" policy. Chinese Journal of Education, 2023, (03): 18-22+102

[15] Guo Wenjing, Fang Xianxu. Deepening the "Double Reduction" Policy to Promote Educational Equity [J]. Today's Media, 2023, 31 (04): 127-130

[16] Jiang Zegang Analysis of the Practical Needs and Paths for Promoting the Development of Community Children's Education from the Perspective of "Double Reduction" [J]. Journal of Guangdong Open University, 2022, 31 (05): 20-23

[17] Zhang Shiyu. Construction of Community Participation Path for Children's Social Education under the Double Reduction Policy [J]. International Public Relations, 2023, (07): 181-184. DOI: 10.16645/j.cnki. cn11-5281/c.2023.07.057

[18] Pei Rong. Research on the Integration of College Volunteer Service into Community Family Education under the Background of Double Reduction. Journal of Huainan Vocational and Technical College, 2023, 23 (05): 124-126

[19] Wang Xiaoxu (2023). Research on Effective Strategies for Collaborative Education between Family, School, and Society under the "Double Reduction" Policy Journal of Tonghua Normal University (11), 115-119 doi:10.13877/j.cnki.cn22-1284.2023.11.019.

[20] Wang Juanjuan&He Yimei (2021). The problem and strategy of home school co-education under the background of "double reduction" Education Science Forum (34), 77-80

[21] Liu Zhijun&Xu Bin (2020). Comprehensive quality evaluation: the key and path to breaking the "score only" evaluation Educational Research (02), 91-100

[22] Ye Zugeng (2020). Strategies for resolving the supply-demand imbalance in community education resources Journal of Ningde Normal University (Philosophy and Social Sciences Edition) (03), 83-88

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242397

Research on the Speed of Information Transmission and User Cognition in the New Media Era

Juewei Wang[1,a,*]

[1]*Jimei University, No.185 Yinjiang Road, Jimei District, Xiamen, Fujian, China*
a. juewei1994@126.com
**corresponding author*

Abstract: This article explores the dynamics of information transmission speed and its impact on user cognition in the new media era. With the rapid evolution of digital technologies and social platforms, the speed at which information is shared and consumed has dramatically increased. This acceleration has reshaped how users perceive, process, and engage with content. The research examines how the fast-paced nature of information dissemination affects users' attention spans, critical thinking, and information retention. Additionally, it analyzes the potential cognitive overload caused by the constant influx of data and the role of algorithms in influencing user behavior and information consumption patterns. The findings highlight the need for a deeper understanding of how users navigate this complex media landscape and offer insights into improving digital literacy to help users make informed decisions in a high-speed information environment.

Keywords: new media, information transmission, user cognition, digital literacy, information overload.

1. Introduction

1.1. Overview of the new media era and rapid information transmission

The new media era, characterized by the rise of digital platforms and social media, has revolutionized how information is created, shared, and consumed. Unlike traditional media, which relied on structured channels such as print, radio, and television, new media operates in a decentralized, fast-paced digital environment[1]. This shift has drastically accelerated the speed of information transmission, with real-time updates, instant news, and user-generated content becoming the norm. Platforms like Twitter, Facebook, and Instagram allow users to disseminate information globally within seconds, breaking down geographical and temporal barriers. News, entertainment, and opinions spread rapidly, often going viral within hours. This immediacy of information, facilitated by high-speed internet and mobile technology, has reshaped communication, making it more interactive and instantaneous. However, this rapid transmission of information has also introduced challenges, particularly in terms of accuracy, cognitive overload, and misinformation[2]. Users are exposed to an overwhelming volume of data, making it difficult to filter relevant information from noise. In this context, the speed of information transmission has profound implications for how individuals perceive, process, and engage with content in the new media landscape, raising questions about the cognitive effects of such an environment.

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242397

1.2. Importance of understanding the relationship between information speed and user cognition

In the new media era, understanding the relationship between the speed of information transmission and user cognition is crucial. As digital platforms accelerate the pace at which information is delivered, users are constantly bombarded with a high volume of data[3]. This rapid flow of information significantly impacts how users process and retain knowledge, influencing their cognitive functions such as attention, memory, and decision-making. One key concern is the effect of fast-paced information on attention spans. With endless streams of content competing for attention, users may develop shorter attention spans and struggle to focus on in-depth analysis[4]. This shift can reduce critical thinking and impair the ability to engage with complex or nuanced topics. Furthermore, cognitive overload—a state where the brain is overwhelmed by excessive information—can occur, making it harder for users to filter relevant from irrelevant content. Understanding this relationship is essential for designing more effective media consumption strategies. It helps inform the development of digital literacy programs that teach users how to navigate and critically evaluate information in a high-speed media environment. By gaining insights into how information speed shapes user cognition, educators, policymakers, and platform designers can work to mitigate the negative effects while enhancing user engagement and information retention in the digital age.

1.3. Purpose and scope of the research

The purpose of this research is to explore how the rapid transmission of information in the new media era affects user cognition, particularly in terms of attention, memory, and decision-making. As digital platforms continuously increase the speed and volume of content delivered to users, it is important to understand the cognitive consequences of this information overload. This research aims to investigate the impact of fast-paced media on users' ability to process, retain, and critically evaluate information. The scope of the research includes an in-depth analysis of the ways in which the speed of information dissemination alters cognitive functions. It covers key aspects such as the influence of rapid information flow on attention spans, the challenges of cognitive overload, and the potential decline in critical thinking due to fragmented content consumption. Additionally, the study will explore how personalized algorithms affect the types of information users engage with, shaping their cognitive patterns and behaviors. This research will also offer insights into strategies for improving digital literacy and user resilience in the face of overwhelming information. By addressing both the positive and negative effects of information speed on cognition, the study seeks to contribute to a more balanced and informed approach to media consumption in the digital age.

2. The Speed of Information Transmission in New Media

2.1. Factors contributing to accelerated information flow (e.g., social media, digital platforms)

The accelerated flow of information in the new media era is driven by several key factors, particularly the rise of social media and digital platforms. Social media platforms like Twitter, Facebook, and Instagram enable instant sharing of content, allowing users to disseminate information globally within seconds. The ability to upload real-time updates, photos, videos, and opinions ensures that information reaches a large audience almost instantly[5]. This immediacy has fundamentally transformed how news, trends, and discussions spread. Additionally, digital platforms, including news websites, blogs, and video-sharing platforms like YouTube, provide continuous streams of content. With the introduction of live streaming and push notifications, users are constantly updated with new information. The 24/7 nature of these platforms ensures that information is continuously

DOI: 10.54254/2753-7064/40/20242397

available, increasing the pace at which it is consumed. Technological advancements also contribute to this acceleration. High-speed internet, mobile devices, and advanced communication technologies allow users to access and share content from anywhere at any time. Algorithms further enhance this flow by curating and delivering personalized content based on user behavior, ensuring that users are exposed to a steady influx of information that aligns with their preferences. These factors combine to create a media landscape where information spreads at an unprecedented speed, profoundly impacting how users consume, process, and engage with content.

2.2. The role of technology and algorithms in shaping the speed of information dissemination

Technology and algorithms play a pivotal role in accelerating the speed of information dissemination in the new media era. The advancement of high-speed internet, smartphones, and real-time communication tools enables users to share and access information instantly. Mobile devices, in particular, have made it possible for users to remain constantly connected, receiving and transmitting information with a few clicks. This technological infrastructure supports the fast-paced digital environment, allowing content to flow seamlessly across platforms and geographies. Algorithms, which are used by social media platforms, search engines, and content-sharing sites, further shape the speed and nature of information dissemination[6]. These algorithms are designed to prioritize and deliver personalized content based on user preferences, behaviors, and interactions. As a result, users are exposed to information that aligns with their interests, increasing engagement and the rapid spread of content. Viral content, in particular, can spread exponentially due to algorithmic amplification, reaching millions of users within hours. Moreover, algorithms often prioritize real-time updates and trending topics, further increasing the speed at which information spreads. This creates a continuous loop of information consumption, where users receive a constant flow of content tailored to their interests. While this enhances user engagement, it also raises concerns about the quality and reliability of rapidly disseminated information, influencing how users process and interpret content in a high-speed media landscape.

2.3. Examples of rapid information spread and its impact on news, entertainment, and communication

The rapid spread of information in the new media era has significantly impacted news, entertainment, and communication. In the realm of news, platforms like Twitter and Facebook enable real-time updates, allowing breaking news to reach global audiences within minutes. For example, during major events such as natural disasters or political crises, information spreads rapidly, sometimes faster than traditional news outlets can verify or report. While this immediacy helps keep the public informed, it also increases the risk of misinformation and unverified content going viral before corrections can be made. In entertainment, platforms like YouTube and TikTok facilitate the rapid sharing of videos, memes, and trends[7]. Viral challenges, for instance, can gain massive popularity within hours, shaping popular culture and influencing behaviors worldwide. This instant fame, however, can lead to fleeting trends and the oversaturation of content, making it harder for sustained engagement. Communication has also been transformed by the speed of information spread. Messaging apps like WhatsApp and Telegram allow users to instantly share videos, articles, and updates within their networks. This has revolutionized personal and professional communication, fostering global connectivity. However, the ease of sharing also contributes to the spread of misinformation and sensationalism, impacting how users perceive and engage with information. In all these areas, the rapid spread of information reshapes user behavior, with both positive and negative implications for how content is consumed and processed.

DOI: 10.54254/2753-7064/40/20242397

3. Impact on User Cognition

3.1. Effects of fast information consumption on attention spans and cognitive processing

The rapid consumption of information in the new media era has significant effects on attention spans and cognitive processing. With the constant influx of news, updates, and content from digital platforms, users are increasingly exposed to fragmented and fast-paced information. This has led to shorter attention spans, as users quickly scroll through feeds, often skimming headlines or watching short video clips without fully engaging with the material. The speed at which content is presented encourages quick consumption rather than deep, reflective thinking. Cognitive processing is also affected by this fast-paced information environment. The brain, overwhelmed by the sheer volume of data, struggles to filter and prioritize information effectively. This can lead to cognitive overload, where users find it difficult to retain or process meaningful insights. The constant switching between topics—whether from news to social media or entertainment—makes it harder for users to concentrate, reducing their ability to focus on complex or in-depth content. Moreover, the speed of information often prioritizes sensationalized or attention-grabbing content, encouraging reactive rather than reflective responses. This diminishes critical thinking and hampers the ability to engage in detailed analysis, as users are constantly driven to consume the next piece of information quickly. Fast information consumption shortens attention spans and reduces the depth of cognitive processing, leading to a more surface-level engagement with content.

3.2. Cognitive overload: challenges in filtering and retaining information

Cognitive overload occurs when the brain is overwhelmed by an excessive amount of information, making it difficult to process, filter, and retain important data. In the new media era, the continuous flow of content from digital platforms contributes to this overload, as users are bombarded with a mix of news, social updates, entertainment, and advertisements. The brain, struggling to prioritize relevant information, becomes less efficient at distinguishing between what is important and what is trivial. One major challenge is the constant distraction caused by multitasking across multiple sources of information—switching between apps, notifications, and different types of content. This scattered attention further impairs the brain's ability to focus, leading to a reduction in information retention. Users may consume a lot of information quickly but struggle to recall or make sense of it later, as the constant influx prevents deep cognitive engagement. Filtering information is also a challenge. With so much content readily available, it becomes difficult to determine what is credible or meaningful. Algorithms amplify this problem by curating information based on user behavior, potentially reinforcing echo chambers and limiting exposure to diverse perspectives. Cognitive overload in the digital age creates significant challenges in filtering and retaining information, weakening users' ability to process data effectively and leading to surface-level understanding rather than deeper comprehension.

3.3. Influence on critical thinking and decision-making in a high-speed media environment

In a high-speed media environment, critical thinking and decision-making are increasingly challenged. The constant flow of information, delivered in short bursts through social media, news apps, and other digital platforms, pushes users to make rapid judgments without fully analyzing or reflecting on the content. This can lead to superficial decision-making, where users react impulsively to headlines or viral posts, rather than taking the time to critically evaluate the information. The speed and volume of information often prioritize sensational or emotionally charged content, which can trigger quick, emotional reactions rather than measured responses. As a result, users may rely more on intuition or biases, rather than engaging in deep, logical analysis. This weakens the capacity for critical thinking,

DOI: 10.54254/2753-7064/40/20242397

as the brain is conditioned to process information quickly and move on, rather than question, verify, or synthesize it. Furthermore, the overwhelming amount of data can lead to decision fatigue, where users, faced with too many choices or conflicting information, become less capable of making informed decisions. The constant exposure to competing narratives or perspectives can also make it harder for users to form well-reasoned opinions, as they are bombarded with partial or incomplete information. The high-speed media environment hampers critical thinking and decision-making, leading to reactive, surface-level judgments instead of thoughtful, informed decisions.

4. The Role of Algorithms and Personalized Content

4.1. How algorithms curate and influence the information users receive

Algorithms play a pivotal role in curating and influencing the information users receive in the digital age. These algorithms, used by platforms such as social media, search engines, and news apps, analyze user behavior—such as clicks, likes, shares, and time spent on content—to tailor and prioritize the information presented to each user. By learning from these interactions, algorithms create a personalized feed that delivers content deemed most relevant or engaging to the individual. This curation significantly shapes users' exposure to information. On one hand, it helps users find content that aligns with their interests, making it easier to access personalized and preferred information. On the other hand, it can limit exposure to diverse viewpoints, reinforcing echo chambers where users are repeatedly exposed to similar ideas and opinions. This selective exposure can reduce critical thinking by limiting the range of information considered and narrowing the context in which users process news and events. Algorithms also amplify the speed and spread of viral content, pushing sensational, emotionally charged, or trending topics to more users. This can influence public perception and behavior by promoting content that elicits strong reactions, often at the expense of balanced or thoughtful discourse. Algorithms curate user experiences by personalizing content, but they also influence the scope and diversity of the information users engage with, shaping how they perceive and process information.

4.2. Impact of personalized content on user behavior and cognitive patterns

Personalized content, driven by algorithms, has a profound impact on user behavior and cognitive patterns in the digital age. By tailoring information based on a user's past interactions, preferences, and habits, platforms create a customized experience that keeps users engaged for longer periods. While this personalization enhances convenience and relevance, it also shapes how users interact with and perceive the world around them. One significant impact is the reinforcement of existing beliefs and preferences. When users are consistently presented with content that aligns with their interests or viewpoints, they are less likely to encounter diverse perspectives. This can create echo chambers, limiting critical thinking and reducing exposure to alternative ideas, which is essential for well-rounded cognitive development. Over time, users may become more entrenched in their views, leading to polarization or a narrowing of worldviews. Personalized content also encourages habitual, passive consumption. As algorithms feed users what they're most likely to engage with, users may become less inclined to actively seek out new or challenging information. This leads to a cognitive pattern where individuals rely on curated content streams, reducing opportunities for independent exploration and deeper learning. Personalized content influences user behavior by shaping consumption habits and cognitive patterns, often reinforcing pre-existing preferences and limiting exposure to diverse perspectives.

DOI: 10.54254/2753-7064/40/20242397

4.3. The feedback loop between user engagement and algorithmic content recommendations

The feedback loop between user engagement and algorithmic content recommendations is a self-reinforcing cycle that heavily influences the information users see and how they interact with digital platforms. When a user engages with specific content—whether by clicking, liking, sharing, or commenting—the algorithm takes note of these actions and adjusts future content recommendations accordingly. This personalized curation ensures that the user is presented with similar content that aligns with their demonstrated interests, increasing the likelihood of further engagement. As users engage more with the content tailored to their preferences, the algorithm continuously refines its suggestions, leading to a highly customized experience. While this increases user satisfaction and platform engagement, it also narrows the scope of information users are exposed to, reinforcing pre-existing interests and viewpoints. Over time, this creates a feedback loop where users are fed content that they are most likely to engage with, which in turn strengthens the algorithm's focus on similar themes. This loop can limit exposure to diverse ideas or challenging viewpoints, leading to echo chambers and reinforcing cognitive biases. It also encourages passive consumption, as users are less likely to actively seek out different content when they are constantly provided with highly engaging, personalized material. In summary, the feedback loop between user engagement and algorithmic recommendations creates a cycle of content reinforcement, shaping user behavior and narrowing exposure to diverse information.

5. Conclusion and Future Considerations

5.1. Summary of key findings on information speed and user cognition

The research highlights the significant impact of the rapid transmission of information on user cognition in the new media era. One of the key findings is that the high speed of information dissemination shortens attention spans, as users are constantly bombarded with content from digital platforms. This fast-paced environment encourages shallow engagement, reducing the capacity for deep, reflective thinking and critical analysis. Cognitive overload is another major consequence of this accelerated information flow. Users struggle to filter through the sheer volume of content, leading to difficulties in retaining meaningful information and making informed decisions. The overwhelming amount of data contributes to decision fatigue and weakens the ability to process information effectively. Additionally, personalized content, shaped by algorithms, creates echo chambers where users are repeatedly exposed to similar viewpoints. This limits exposure to diverse ideas, reinforcing pre-existing biases and narrowing cognitive development. The feedback loop between user engagement and algorithmic recommendations further deepens this effect, as users are consistently fed content that aligns with their interests, leading to passive consumption. The speed of information in the digital age presents challenges to user cognition, affecting attention, memory, critical thinking, and decision-making. These findings underscore the need for better digital literacy and strategies to manage cognitive overload.

5.2. The importance of digital literacy in navigating the new media landscape

In the fast-paced and information-saturated new media landscape, digital literacy has become a crucial skill for users to navigate effectively. Digital literacy refers to the ability to critically evaluate, interpret, and engage with digital content, which is essential in an era where information spreads rapidly, and misinformation can easily go viral. With the vast amount of content available across social media platforms, news outlets, and websites, users need the skills to distinguish between credible sources and unreliable or biased information. One key aspect of digital literacy is the ability to assess the quality and accuracy of information. Users must develop critical thinking skills to

DOI: 10.54254/2753-7064/40/20242397

question the validity of the content they consume and recognize the potential influence of algorithms that curate their feeds. By understanding how personalized content is delivered, users can become more aware of the echo chambers and cognitive biases that arise from constant exposure to similar viewpoints. Moreover, digital literacy helps users manage cognitive overload by teaching them how to filter and prioritize relevant information. This empowers individuals to make informed decisions in a high-speed media environment, reducing the risk of being overwhelmed by the sheer volume of data. Digital literacy is essential for users to navigate the complex new media landscape, promoting better information consumption, critical thinking, and informed decision-making.

5.3. Recommendations for future research and strategies to mitigate cognitive overload and misinformation

To address the growing challenges of cognitive overload and misinformation in the new media era, future research should focus on understanding how users interact with rapidly disseminated information and the psychological effects of continuous digital engagement. Studies could explore the long-term impact of fast-paced information consumption on attention spans, critical thinking, and memory retention. Additionally, research into how algorithms influence information exposure and user behavior could provide insights into minimizing the reinforcement of biases and echo chambers. In terms of strategies to mitigate cognitive overload, promoting digital literacy should be a priority. Educational programs that teach users how to critically evaluate information, recognize misinformation, and manage the flow of digital content can empower individuals to make more informed decisions. Media platforms can also play a role by implementing features that help users filter and prioritize information more effectively, such as tools for fact-checking or reducing algorithmic bias in content recommendations. To combat misinformation, collaboration between tech companies, educators, and policymakers is essential. Creating more transparent algorithms, improving moderation efforts, and encouraging the development of independent fact-checking services can help limit the spread of false information. Future research and proactive strategies focused on digital literacy and platform responsibility will be crucial in reducing cognitive overload and misinformation in the digital age.

References

[1] *Haythornthwaite, C. (2002). Strong, weak, and latent ties and the impact of new media. The information society, 18(5), 385-401.*

[2] *Dennis, A. R., Fuller, R. M., & Valacich, J. S. (2008). Media, tasks, and communication processes: A theory of media synchronicity. MIS quarterly, 575-600.*

[3] *CPCM, D. J., & Noah, P. (2014). Big data in the information age: exploring the intellectual foundation of communication theory. Information Systems Education Journal, 12(1), 15.*

[4] *Cappella, J. N., Kim, H. S., & Albarracín, D. (2015). Selection and transmission processes for information in the emerging media environment: Psychological motives and message characteristics. Media psychology, 18(3), 396-424.*

[5] *Bandura, A. (2009). Social cognitive theory of mass communication. In Media effects (pp. 110-140). Routledge.*

[6] *Metzger, M. J., Flanagin, A. J., Eyal, K., Lemus, D. R., & McCann, R. M. (2003). Credibility for the 21st century: Integrating perspectives on source, message, and media credibility in the contemporary media environment. Annals of the International Communication Association, 27(1), 293-335.*

[7] *Sanborn, F. (2022). A cognitive psychology of mass communication. Routledge.*

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242331

Neuroplasticity and Cocaine Exposure During Adolescence

Xinyi Zeng[1,a,*]

[1]*School of Social Sciences, University of California Irvine, California, United States*
a. Zengx14@uci.edu
**corresponding author*

Abstract: The adolescent brain is particularly vulnerable to the effects of cocaine exposure due to ongoing neurodevelopment especially in areas that are crucial for cognitive and emotional regulation. This review explores the multifaceted impact of cocaine on neuroplasticity during adolescence, thereby highlighting both the immediate and long-term consequences of drug exposure. Key findings from recent studies indicate that cocaine use during adolescence leads to significant alterations in synaptic plasticity, dendritic spine morphology, and neurotransmitter systems, which may persist into adulthood and contribute to addictive behaviors. Additionally, the interaction between genetic predispositions, environmental stressors, and drug exposure is emphasized. The review also analyzed the risks of early-life stress and social isolation on cocaine-induced neuroplasticity, which can render anxiety-related behaviors and lead to neurological changes. Future studies should incorporate longitudinal design to understand the long-term trajectory of neuroplasticity induced by cocaine. This paper can provide some suggestions to the development of prevention and intervention programs for adolescents at risk.

Keywords: neuroplasticity, cocaine exposure, adolescence.

1. Introduction

The importance of studying neuroplasticity and cocaine exposure during adolescence is multifaceted. First, understanding the developmental stage of adolescence is crucial because this period is marked by profound brain maturation and increased vulnerability to substance abuse. The prefrontal cortex, responsible for executive functions such as decision-making, impulse control, and risk assessment, is still developing during adolescence. This developmental stage is critical for shaping lifelong cognitive and behavioral patterns. Second, investigating the impact of cocaine on neuroplasticity during adolescence is important for identifying the specific neural mechanisms that undergo within addiction and its long-term consequences. This knowledge can contribute to the development of targeted interventions and prevention strategies aimed at mitigating the adverse effects of cocaine on the adolescent brain [1]. Finally, studying this topic can lead to the improvement of intervention programs and systems designed for adolescents at risk of substance abuse. By understanding how cocaine exposure affects neuroplasticity during this critical developmental period, researchers and clinicians can develop more effective therapeutic approaches to support recovery and promote healthy brain development [2].

Existing research on neuroplasticity and cocaine exposure during adolescence has identified several key trends and theories. One prominent trend is the focus on the effects of cocaine on synaptic

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242331

plasticity, particularly in the prefrontal cortex and limbic regions of the brain. Studies have shown that cocaine use during adolescence can lead to alterations in synaptic strength, dendritic spine morphology, and neurotransmitter systems, which can persist into adulthood and contribute to addictive behaviors [1-2].

The main theories in this field revolve around the concept of drug-induced neuroplasticity and its role in addiction. The "reward pathway" theory suggests that cocaine enhances synaptic plasticity in the brain's reward circuitry leading to increased drug-seeking behavior and reinforcing the addictive cycle. Additionally, the "developmental neuroplasticity" theory posits that adolescence is a period of heightened vulnerability to drug-induced changes in neural circuits, which can have long-lasting effects on behavior and cognition [1]. Despite the significant progress in understanding the effects of cocaine on neuroplasticity during adolescence, several gaps remain in this field. One major gap is the limited research on the long-term effects of adolescent cocaine exposure on cognitive and behavioral outcomes in humans. While animal studies have provided important insights, translating these findings to human populations requires further investigation [1].

Another gap is the lack of research on the interaction between genetic and environmental factors in modulating the effects of cocaine on neuroplasticity during adolescence. Understanding the interplay between genetic predispositions and environmental influences, such as stress and peer pressure, can provide a more comprehensive understanding of the risk factors and protective mechanisms associated with cocaine use in adolescents 1. Additionally, there is a need for research on the effectiveness of specific interventions and treatment strategies for adolescents with a history of cocaine use. While various therapeutic approaches have been explored, including behavioral therapies and pharmacological treatments, their efficacy in promoting neuroplasticity and recovery in adolescent populations remains understudied [1].

This review aims to address these gaps by synthesizing existing research on neuroplasticity and cocaine exposure during adolescence and highlighting studies that focus on the long-term effects, genetic and environmental interactions, and intervention strategies. The relevant studies in terms of their methodologies and findings will be discussed in this paper, which could possibly provide a comprehensive overview of the current state of knowledge in this field. By identifying the gaps and proposing directions for future research, this review aims to contribute to the development of more effective interventions and support systems for adolescents at risk of cocaine abuse [1-2].

Understanding the impact of cocaine exposure on neuroplasticity during adolescence is crucial for developing targeted interventions and prevention strategies. By addressing the gaps in existing research and exploring the complex interactions between genetic, environmental, and developmental factors, it's helpful in enhancing understanding of the neural mechanisms underlying addiction and promote healthier outcomes for adolescents [2].

2. Cocaine Exposure During Adolescence: Long-Term Impact on Neuroplasticity

Cocaine exposure during adolescence has a significant impact on neuroplasticity, which could possibly lead to lasting changes in brain function that can persist into adulthood. This period of brain development is marked by heightened plasticity, making it particularly vulnerable to external influences such as drug use. Research has shown that cocaine use during this critical time can lead to alterations in neural circuitry, including changes in synaptic plasticity and neurotransmitter systems, which are associated with long-term behavioral consequences.

The study conducted by Parsegian and other researchers examined the long-term effects of cocaine exposure during adolescence on neuroplasticity using a rat model. The researchers administered a 7-day cocaine injection to adolescent high-responder rats. They found that cocaine exposure led to persistent psychomotor sensitization and significant alterations in histone modifications within the nucleus accumbens (NAc) including a decrease in repressive H3K9me3 and an increase in permissive

DOI: 10.54254/2753-7064/40/20242331

acH3K9 [3]. This study combined detailed behavioral assessments with targeted epigenetic analyses, which highlights the effects of adolescent cocaine use on brain structure and function, and underscoring the importance of early prevention strategies. Adolescence is a developmental period marked by heightened neuroplasticity, during which the brain is particularly vulnerable to external influences such as drug exposure. The persistence of psychomotor sensitization and epigenetic changes observed in the study indicates that cocaine use during adolescence can lead to substantial alterations in brain function, which may expose individuals to the harm of addiction. The decrease in repressive histone and the increase in permissive ones suggest that cocaine exposure during this period can fundamentally alter gene expression patterns, thereby locking in a heightened vulnerability to addictive behaviors. These molecular changes also reinforce the idea that interventions during adolescence are crucial. This research suggests the need for implementing prevention strategies such as careful education, early intervention programs, and strict policies that limit adolescents' access to drugs, which could reduce the likelihood of long-term addiction and related mental health issues.

3. Genetic and Environmental Influences on Adolescent Neuroplasticity: The Role of PDE4 in Cocaine-Induced Vulnerability

Adolescence is critical for healthy cognitive and emotional development. Also, the combination of genetic vulnerability and environmental stress during adolescence can increase the vulnerability to neuroplasticity induced by cocaine exposures. In the study conducted by Hikida and other researchers who genetically modified rats to carry a dominant-negative mutation in the DISC1 gene, making them prone to neuropsychiatric disorders. These genetically vulnerable rats were subjected to social isolation during adolescence to simulate environmental stress, creating a gene-environment interaction (GXE) as the independent variable. The dependent variables were locomotor activity following cocaine administration and conditioned place preference (CPP), both of which measure drug-induced neuroplastic changes [4].

The results showed that GXE mice exhibited significantly greater locomotor sensitization and a stronger preference for the cocaine-paired environment compared to controls. The study also found a significant increase in PDE4 activity in the nucleus accumbens (NAc) of GXE mice, suggesting altered cAMP signaling, which contributes to their enhanced cocaine sensitivity and the persistence of addictive behaviors. Importantly, administering rolipram, a PDE4 inhibitor, before cocaine exposure blocked these effects, indicating that PDE4 could be a potential therapeutic target for preventing cocaine addiction in individuals with genetic vulnerability and environmental stress during adolescence. The study emphasizes the importance of gene-environment interactions in addiction development and identifies PDE4 as a key molecular target for intervention.

These results strongly support the idea that the interaction between genetic predisposition and environmental stress during adolescence not only heightens the brain’s vulnerability to cocaine but also induces long-term molecular changes that could perpetuate addictive behaviors even after the cessation of drug use. It also underscores the importance of understanding these interactions to develop effective interventions that target the molecular pathways involved in addiction, particularly during the critical period of adolescence. By highlighting the role of PDE4 in these processes, the research provides a specific target for therapeutic interventions aimed at reversing or preventing the neuroplastic changes associated with cocaine addiction.

4. The Role of Early-Life Stress in Modulating Cocaine-Induced Neuroplasticity and Negative Affect

Early-life stress, an adverse experiences or environmental challenges occurred during critical period of developments especially childhood and adolescence, exacerbates the long-term neuroplastic and

DOI: 10.54254/2753-7064/40/20242331

behavioral effects of cocaine exposure during adolescence, thereby creating a compounded risk for the development of addiction and negative affective states. In 2021, Bis-Humbert and other researchers examined the combined effects of early-life stress and adolescent cocaine exposure on behavioral and neurochemical outcomes in female rats. In the experiment, female Sprague-Dawley rats were subjected to maternal deprivation on postnatal day 9 and then exposed to a 7-day cocaine regimen during adolescence (postnatal days 33–39) [5]. The results indicated that early-life stress alone did not significantly alter behavior during adolescence. However, when it combined with cocaine exposure, it led to a pronounced increase in negative affect during adulthood. This was evidenced by increased immobility in the forced swim test and reduced exploratory behavior in the open field test, signaling a pro-depressive state. Moreover, the combination of stress and cocaine exposure resulted in elevated levels of the neuroplasticity marker FADD in the hippocampus, suggesting long-lasting structural changes in the brain that contribute to the observed behavioral alterations. The elevated levels of neuroplasticity markers like FADD in the hippocampus suggest that these stressors lead to lasting changes in brain structure, increasing vulnerability to negative affect and addiction in adulthood. The observed pro-depressive behaviors indicate that the brain's response to these combined stressors may predispose individuals to psychiatric disorders. This highlights the importance of early interventions aimed at reducing stress to intervene or prevent this factor from being the possible influencer that causes future development of drug addiction and related mental health issues.

4.1. Long-Term Consequences of Chronic Social Stress During Adolescence on Anxiety-Related Behaviors

If stress is not be resolved in time, it will become chronic stress. Chronic social stress during adolescence has long-term effects on anxiety-related behaviors, which suggests that this critical period is particularly sensitive to stressors that can alter emotional regulation later in life. Research shows that the prolonged exposure to social stress during this developmental stage can lead to persistent changes in brain regions associated with anxiety, thereby resulting in producing anxiety-related behaviors in adulthood. In 2019, Caffino and other researchers explored the long-term effects of chronic social stress on anxiety behaviors in adolescent rats and its impact in adulthood. The independent variable was exposure to chronic social stress during adolescence, while the dependent variables included anxiety-related behaviors measured through tests like the elevated plus maze and open field test, and changes in neurobiological markers such as corticotropin-releasing factor (CRF) expression in the brain [6].

This study involved subjecting adolescent rats to social or isolation stress over several weeks. After this the rats matured into adulthood without further stressors, which allowed researchers to attribute any long-term behavioral changes directly to the adolescent stress experience. Behavioral assessments were conducted to evaluate anxiety, and brain tissues were analyzed to investigate changes in CRF expression and other stress-related biomarkers. The results showed that rats exposed to chronic social stress during adolescence exhibited significantly higher levels of anxiety-related behaviors in adulthood compared to controls who have fewer stress. These behaviors were linked to increased CRF expression in brain regions associated with anxiety, such as the amygdala and prefrontal cortex. The persistence of these changes into adulthood suggests that chronic social stress during adolescence can lead to lasting alterations in the stress response system, potentially predisposing individuals to anxiety disorders.

The changes in adulthood suggest that chronic social stress during adolescence can lead to alterations in the stress response system, potentially predisposing individuals to anxiety disorders. This study underscores the critical impact of adolescent stress on long-term mental health, as the heightened neuroplasticity during this developmental period makes the brain particularly susceptible

DOI: 10.54254/2753-7064/40/20242331

to external influences. The increased expression of CRF in key brain regions like the amygdala and prefrontal cortex indicates that the stress system is being reprogrammed in a way that sustains heightened anxiety responses well into adulthood.

These findings highlight the importance of early interventions designed to mitigate the effects of chronic stress during adolescence. By addressing stressors early on, it may be possible to prevent the reprogramming of the stress response system and reduce the risk of developing anxiety-related disorders later in life. Interventions could include therapeutic strategies to enhance resilience, supportive environments, or even pharmacological approaches to modulate stress-related neurobiological changes. Ultimately, this research emphasizes that safeguarding adolescent mental health through early intervention is crucial for preventing long-term psychological consequences.

Chronic social stress during adolescence not only heightens anxiety-related behaviors in adulthood but also leads to lasting alterations in neuroplasticity that underpin these behavioral changes. The interplay between prolonged stress exposure and the developing brain during this critical period sets the stage for enduring neurobiological vulnerabilities, as evidenced by alterations in key neural circuits involved in emotion regulation and stress response. In 2020, Caffino and other researchers examined the long-term effects of chronic social stress during adolescence on anxiety behaviors and neuroplasticity. The study's independent variable was the exposure to chronic social stress while the dependent variables included anxiety-related behaviors. Research was measured through elevated maze and open field tests, and changes in neural markers like brain-derived neurotrophic factor (BDNF) expression in the hippocampus [7].

Adolescent rats were exposed to chronic social stress over an extended period, and after the stress exposure, they were allowed to mature without further stressors. This approach ensured that any observed changes in adulthood could be directly attributed to the earlier stress experience. Behavioral assessments indicated significantly higher anxiety levels in adulthood for the stressed rats compared to non-stressed controls. This increased anxiety was linked to reduced BDNF expression in the hippocampus, a region critical for emotion regulation and memory. The study suggests that chronic social stress during adolescence leads to lasting modifications in brain plasticity, increasing vulnerability to anxiety disorders later in life.

These findings underscore the crucial role that adolescence plays in brain development and the brain's response to stress. During this period, the brain undergoes significant neuroplastic changes, making it particularly sensitive to external stressors like chronic social stress. The research demonstrates that stress during adolescence can lead to enduring changes in brain regions critical for emotion regulation, such as the hippocampus, where reduced BDNF expression was observed. This reduction in BDNF, a key player in supporting neuroplasticity and cognitive function, suggests that chronic stress during this formative period can disrupt normal brain development, leading to heightened anxiety and other emotional disorders that persist into adulthood. These findings underscore the long-term risks of chronic stress during adolescence, as anxiety-related behaviors persisting into adulthood indicate lasting changes in brain plasticity. This highlights the need for early interventions to mitigate social stress during this critical period, potentially preventing enduring brain alterations that increase the risk of anxiety disorders later in life.

4.2. The Impact of Combined Early-Life Stress and Adolescent Cocaine Exposure on Long-Term Anxiety and Neuroplasticity

The combined effects of early-life stress and cocaine exposure during adolescence on anxiety-related behaviors and neuroplasticity highlight the importance of multiple stressors during critical periods of brain development. This concept is supported by evidence showing that early-life stress can exacerbate the long-term behavioral and neurobiological effects of adolescent drug exposure, which lead to increased anxiety and neuroplasticity in adulthood.

DOI: 10.54254/2753-7064/40/20242331

In Bis-Humbert and other researchers' study, the long-term effects of combining early-life maternal deprivation with adolescent cocaine exposure were examined in male rats. This study was measured through forced swim tests and other behavioral assays, and changes in the expression of neuroplasticity markers, such as Fas-associated protein with death domain (FADD) in the hippocampus [8]. It is also involved in subjecting male Sprague-Dawley rats to a single episode of maternal deprivation on postnatal day 9 followed by a 7-day cocaine regimen during adolescence (postnatal days 33–39) [8]. Behavioral tests aimed to assess anxiety-related behaviors during both adolescence and adulthood and hippocampal tissue was analyzed for changes in FADD expression. The results indicated that the combination of early-life stress and adolescent cocaine exposure led to a significant increase in anxiety-related behaviors in adulthood as it was evidenced by increased immobility in the forced swim test and altered performance in other anxiety-related tasks. Additionally, these rats showed a dysregulation of FADD expression in the hippocampus, with maternal deprivation increasing FADD content during adolescence, but a decrease in FADD levels was observed in adulthood after prolonged cocaine withdrawal. This suggests that the combined stressors induced a long-lasting impact on neuroplasticity, contributing to the persistent anxiety-related behaviors observed. These findings underscore the critical nature of the adolescent period for brain development and the compounding effects of multiple stressors and highlight the importance of considering both early-life experiences and adolescent drug exposure in understanding the development of anxiety disorders and other mental health issues.

4.3. The Long-Term Impact of Social Isolation on Anxiety and Neuroplasticity

Social isolation during adolescence significantly impacts anxiety-related behaviors and neuroplasticity, thereby leading to persistent changes in brain structure and function that extend into adulthood. This concept is supported by evidence showing that prolonged social isolation during critical developmental periods can lead to alterations in brain regions involved in stress and emotion regulation, ultimately resulting in heightened anxiety and other behavioral disturbances. Researchers examined the effects of social isolation on adolescent rats and its long-term impact on anxiety-related behaviors and neuroplasticity. The independent variable in this study was the duration of social isolation during adolescence while the dependent variables included measures of anxiety-related behaviors and neuroplastic changes in the brain such as alterations in synaptic vesicle glycoprotein 2A (SV2A) density in the hippocampus.

This study involved subjecting adolescent rats to prolonged social isolation and then assessing their behavior and brain structure in adulthood. Behavioral tests, such as the elevated plus maze and open field test, were conducted to evaluate anxiety levels. Additionally, brain tissue was analyzed to measure SV2A density, a marker of synaptic activity, in key regions associated with anxiety and stress response, in the hippocampus [9]. The results indicated that rats exposed to social isolation during adolescence exhibited significantly higher levels of anxiety-related behaviors in adulthood compared to socially housed controls. This increased anxiety was accompanied by changes in SV2A density in the hippocampus, suggesting that social isolation led to long-lasting alterations in synaptic activity and neuroplasticity. Specifically, the study found that isolated rats had increased SV2A density in the dorsal and ventral hippocampus, which persisted long after the isolation period had ended. These findings highlight the critical role of social experiences during adolescence in shaping long-term brain development and emotional health. The persistent changes in neuroplasticity observed in the hippocampus suggest that social isolation during this critical period can have enduring effects on the brain's ability to regulate stress and anxiety.

Adolescent social isolation has a significant and lasting impact on both anxiety-related behaviors and the brain's response to cocaine, emphasizing the critical role of early social experiences in shaping long-term mental health outcomes. This relationship is particularly evident in how social isolation

DOI: 10.54254/2753-7064/40/20242331

alters neurobiological pathways that regulate stress and reward, leading to heightened vulnerability to anxiety and substance use disorders in adulthood.

In another study, researchers examined the effects of a brief period of social isolation during adolescence on anxiety-like behaviors and cocaine-induced neuroplasticity in male rats. The independent variable was the exposure to social isolation during adolescence, while the dependent variables included anxiety-related behaviors measured in adulthood and changes in the Wnt/β-catenin signaling pathway, particularly in the prefrontal cortex (PFC) and nucleus accumbens (NAcc), which are crucial regions for emotion regulation and reward processing [10]. This research involved isolating male rats for five days during adolescence (postnatal days 30 to 35) and then assessing their behavior and brain structure in adulthood. Behavioral tests, including the open field test and conditioned place preference (CPP) for cocaine, were conducted to evaluate anxiety levels and cocaine sensitivity. In addition, molecular analyses were performed to measure the activity of the Wnt/β-catenin pathway in the PFC and NAcc [10].

The results revealed that social isolation during adolescence led to a significant increase in anxiety-like behaviors in adulthood, as evidenced by reduced time spent in the center of the open field test, indicating higher anxiety levels. Furthermore, the study found that isolated rats displayed enhanced behavioral sensitization to cocaine, demonstrated by an increased preference for the cocaine-paired environment in the CPP test. At the molecular level, these behavioral changes were associated with decreased activity of the Wnt/β-catenin pathway in the PFC shortly after isolation, which persisted into adulthood, and increased activity of this pathway in the NAcc following cocaine exposure. These findings showcased the profound impact of social isolation during adolescence on long-term anxiety and drug sensitivity. The alteration in the Wnt/β-catenin signaling pathway highlights a potential molecular mechanism through which early-life social experiences can influence vulnerability to anxiety and addiction. This research suggests that interventions aimed at enhancing social interactions during adolescence could be crucial in preventing the development of these disorders.

5. Conclusion

The interaction between genetic predispositions, environmental stress, and drug exposure during adolescence plays a pivotal role in shaping the long-term vulnerability to addiction. Adolescence is a critical developmental stage characterized by significant neuroplasticity, making the brain more adaptable yet also more vulnerable to external influences, such as drug exposure. The introduction of cocaine during this period can lead to profound and enduring changes in neural circuitry, particularly in areas associated with reward and motivation, such as the nucleus accumbens (NAc). Studies have shown that cocaine use during adolescence can alter synaptic strength, dendritic spine morphology, and neurotransmitter systems, which can persist into adulthood and contribute to addictive behaviors. While animal models provide valuable insights, translating these findings to human populations remains a significant challenge. It's important to consider both genetic and environmental factors when assessing the risk of addiction in adolescents. However, there is a need for further research involving human subjects to validate these findings and explore their clinical implications. Additionally, understanding how these interactions manifest in diverse populations with varying genetic backgrounds and environmental exposures is crucial for developing targeted prevention and intervention strategies.

While the current study provides significant insights into the long-term effects of social isolation and cocaine exposure during adolescence on anxiety-related behaviors and neuroplasticity, there are several limitations that must be acknowledged. First, the use of animal models, while informative, may not fully capture the complexity of human experiences and the full range of environmental influences that contribute to anxiety and substance use disorders. Additionally, the study focused primarily on male rats, leaving the potential sex differences in response to social isolation and cocaine

DOI: 10.54254/2753-7064/40/20242331

exposure underexplored. Future research should include both male and female subjects to determine if there are sex-specific effects that could inform more tailored intervention strategies. Another limitation is the relatively limited time duration of the social isolation period (five days), which, while effective in inducing significant behavioral and neurobiological changes, may not fully represent the chronic stress experienced by some individuals during adolescence. Future studies should explore the effects of varying durations and intensities of social isolation to better understand the dose-response relationship and its implications for long-term mental health outcomes.

The findings of these studies demonstrate the critical impact of adolescent social isolation on long-term anxiety and susceptibility to cocaine-induced neuroplasticity. The results suggest that early-life social experiences play a pivotal role in shaping the brain's response to stress and reward, with significant implications for the development of anxiety disorders and substance use disorders in adulthood. The study also emphasizes the importance of early social interactions in promoting healthy brain development and preventing long-term psychological issues. Given the limitations of the current research, future studies should explore sex differences, the effects of varying durations of social isolation, and additional molecular pathways involved in these processes. Ultimately, a deeper understanding of the neurobiological consequences of adolescent social isolation will inform more effective prevention and treatment strategies for anxiety and addiction, improving long-term outcomes for individuals exposed to social stress during critical periods of development.

References

[1] *Piazza, P.V. and Deroche-Gamonet, V. (2013). A multistep general theory of transition to addiction. Psychopharmacology, 229, 387-413.*

[2] *Feltenstein, M.W. and See, R.E. (2013). Systems level neuroplasticity in drug addiction. Cold Spring Harbor Perspectives in Medicine, 3(5), a011916.*

[3] *Parsegian, A., García-Fuster, M.J., Hebda-Bauer, E., Watson, S.J., Flagel, S.B. and Akil, H. (2022). Adolescent cocaine differentially impacts psychomotor sensitization and epigenetic profiles in adult male rats with divergent affective phenotypes. Frontiers in psychiatry, 13, 1024617.*

[4] *Hikida, T., Morita, M., Kuroiwa, M., Macpherson, T., Shuto, T., Sotogaku, N. and Nishi, A. (2020). Adolescent psychosocial stress enhances sensitization to cocaine exposure in genetically vulnerable mice. Neuroscience research, 151, 38-45.*

[5] *Bis-Humbert, C. and García-Fuster, M.J. (2021). Adolescent cocaine induced persistent negative affect in female rats exposed to early-life stress. Psychopharmacology, 238(12), 3399–3410. https://doi.org/10.1007/s00213-021-05955-z*

[6] *Caffino, L., Giannotti, G., Messa, G., Mottarlini, F. and Fumagalli, F. (2019). Repeated cocaine exposure dysregulates BDNF expression and signaling in the mesocorticolimbic pathway of the adolescent rat. The World Journal of Biological Psychiatry, 20(7), 531-544.*

[7] *Caffino, L., Moro, F., Mottarlini, F., Targa, G., Di Clemente, A., Toia, M. and Cervo, L. (2021). Repeated exposure to cocaine during adolescence enhances the rewarding threshold for cocaine-conditioned place preference in adulthood. Addiction Biology, 26(5), e13012.*

[8] *Bis-Humbert, C., García-Cabrerizo, R. and García-Fuster, M.J. (2021). Increased negative affect when combining early-life maternal deprivation with adolescent, but not adult, cocaine exposure in male rats: regulation of hippocampal FADD. Psychopharmacology, 238, 411-420.*

[9] *Rossi, R., Bærentzen, S.L., Thomsen, M.B., Real, C.C., Wegener, G., Grassi-Oliveira, R. and Landau, A.M. (2024). A single dose of cocaine raises SV2A density in hippocampus of adolescent rats. Acta Neuropsychiatrica, 36(2), 109-117.*

[10] *Cuesta, S., Funes, A. and Pacchioni, A.M. (2020). Social isolation in male rats during adolescence inhibits the Wnt/β-catenin pathway in the prefrontal cortex and enhances anxiety and cocaine-induced plasticity in adulthood. Neuroscience Bulletin, 36(6), 611-624.*

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242344

Research on the Impact of Gender Role Perceptions on Women's Educational Opportunities in Urban and Rural China

Miya Li[1,a,*]

[1]*Crofton House School, Vancouver, British Columbia, V6N2M9, Canada*
a. limiya881@gmail.com
**corresponding author*

Abstract: This study explores the impact of gender role perceptions on women's educational opportunities in urban and rural China, focusing on how socio-cultural, familial, societal, and personal factors contribute to educational disparities. Through a comprehensive review of existing research, the study tests three hypotheses: (H1) perceptions of gender roles in urban areas correlate with higher educational attainment among women compared to rural areas; (H2) exposure to progressive media positively influences educational ambitions across both urban and rural contexts; and (H3) increased access to technology narrows the gender gap in education between urban and rural women. The findings underscore the persistence of traditional gender norms in rural areas, which hinder women's educational progress, while urban areas benefit from more progressive views that support higher educational attainment. The study also highlights the significant role of media and technology in challenging traditional gender norms and promoting educational equality. By addressing these factors, policymakers and educators can develop targeted strategies to reduce educational disparities and foster gender equality in both urban and rural China.

Keywords: Gender roles, urban and rural China, traditional norms, women's education, patriarchy.

1. Introduction

The evolution of gender roles in women's education in China reflects a significant journey toward equality. Historically, patriarchal norms severely restricted educational opportunities for women, leading to widespread illiteracy among women in ancient China. However, the 19th century marked a turning point with increased East-West interactions, which facilitated the establishment of schools and missionary girls' schools dedicated to female education [1]. The 20th century furthered this progress with the establishment of girls' schools and significant reforms following the 1911 Revolution, ultimately leading to the legal affirmation of women's educational rights [2]. Following the founding of the People's Republic of China in 1949, there was rapid development in women's education, though 90% of women were still illiterate at that time [3]. The post-1978 economic reforms sparked considerable advancements, particularly in higher education. By 2020, the female illiteracy rate had decreased to 4.1% [4]. Educational statistics reveal a significant shift: only 23% of primary school students were girls in 1949, a figure that rose to over 46% by the 2000s, nearing parity with

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242344

boys [5]. In secondary education, girls represented 46.7% of middle school students in 2002 and 50.4% in tertiary institutions by 2020 [6]. Higher education saw a dramatic increase from 24.1% female college students in 1978 to over 52% by 2015, with female postgraduate students reaching 50.9% in 2020 [7]. (comment: all blue highlighted sections are from the same source, source 3).

Despite these advancements, challenges persist. Socio-cultural factors play a crucial role in shaping gender roles and exert great impact on women. Traditional son preference in rural areas continues to result in lower average schooling years and educational attainment for women compared to their counterparts in developed countries [8]. Wang Xiaojie investigates the persistence of son preference in rural China, showing that this cultural norm leads to disparities in educational investment between boys and girls. While traditional preferences for boys over girls in education are still prevalent in rural western China, ongoing social and economic development is expected to mitigate these issues over time [9]. This study also outlines the effects of parental education levels on these cultural norms, finding that more educated parents have higher tendencies to invest equally in their daughter's education. Rising education levels are also contributing to delayed marriage and childbearing, affecting demographic trends [9].

The purpose of this study is to understand the factors shaping educational disparities and to provide insights for policymakers and educators to address these inequalities. This will be achieved through a comprehensive review of research exploring the impact of gender role perceptions on women's access to education in both urban and rural areas of China. The method is also applied to prove three hypotheses demonstrated as follows. To prove the first hypothesis (H1), the study will synthesize findings from previous research comparing educational attainment levels between urban and rural women, focusing on how gender role perceptions in each setting contribute to these differences. For the second hypothesis (H2), the study will examine existing literature on the impact of exposure to progressive media on women's educational ambitions across both urban and rural contexts. Finally, to support the third hypothesis (H3), the study will review studies that analyze how increased access to technology has influenced the gender gap in education between urban and rural women. Through this research-based approach, the study will provide a detailed understanding of the factors shaping educational disparities and offer insights for policymakers and educators on addressing these inequalities.

The study highlights the importance of ongoing efforts to promote gender equality in education, particularly through policies and initiatives that challenge traditional gender norms and expand access to educational resources in rural areas. By fostering progressive gender role perceptions and leveraging the power of media and technology, there is potential to further close the educational gap between urban and rural women in China.

H1: Perceptions of gender roles in urban areas will correlate with higher educational attainment among women compared to perceptions in rural areas [10].

H2: Exposure to progressive media will positively influence women's educational ambitions, regardless of urban or rural residence [11].

H3: Increased access to technology will narrow the gender gap in education between urban and rural women [12].

2. Gender Role Perceptions in Various Aspects of Chinese Society

2.1. Cultural

The concept of gender is central to Chinese philosophy, rooted in the interplay of yin and yang, which represent complementary forces such as "dark and light" and "female and male." These ideas, originating from the Hundred Schools of Thought (c. 500s-200s B.C.E.), have significantly shaped cultural gender roles in China. Confucianism often highlights the dominant, male-associated yang,

DOI: 10.54254/2753-7064/40/20242344

while Daoism, especially through Laozi, appreciates the subordinate, female-associated yin. Despite their differing views, both traditions see yin and yang as interdependent and complementary. The modern Chinese term for gender, embodies this understanding, referring to physiological differences that underpin social identities. These philosophical traditions provide valuable perspectives for contemporary feminist thought, though they must be applied with caution [13].

2.2. Familial

Educational equality remains a significant issue in China, despite numerous government policies aimed at balancing educational opportunities, such as expanding higher education and implementing compulsory education. While access to primary education is nearly universal and male and female enrollment in higher education is almost equal, disparities persist between urban and rural areas. In rural regions, women have fewer educational opportunities than men. Wang argues that academic performance is not the primary reason for this disparity; instead, factors such as parents' educational levels, the number of siblings, and family economic conditions play a crucial role. Rural families often have lower parental education levels, more children, and poorer economic conditions, contributing to the gender gap in education. Wang comments that future research should explore children's attitudes toward education to better understand the motivations and barriers influencing their educational pursuits [10].

2.3. Societal

Traditional gender roles significantly lower women's earnings but have no notable effect on men's incomes. The Oaxaca-Blinder decomposition shows that these attitudes contribute to the gender income gap through differences in educational attainment, labor force participation, working hours, and occupational status. Despite modernization, traditional gender attitudes, especially among men, remain prevalent. Men earn about 32.4% more than women on average, and women's labor force participation rate is significantly lower at 75.7%, compared to 94.9% for men. Women also work fewer hours weekly but hold slightly higher occupational statuses. While women's education levels are improving, they still lag behind men. This indicates that societal gender roles in China expect women to be less active in the workforce and more focused on traditional roles, despite some progress toward equality [14].

2.4. Personal

While students generally hold progressive views on gender roles, there are personal differences. Girls often aspire to greater equality in social status and resource sharing but may also support traditional notions of submissiveness in sexual interactions more than boys. Traditional gender roles, although gradually changing, still impact how individuals personally perceive and respond to non-consensual sexual contact (NCS). For example, girls with more traditional gender-role attitudes were more vulnerable to physical NCS. These findings emphasise the need to address these personal attitudes and enhance education on NCS to better support both men and women in navigating gender roles and preventing risky situations [15].

3. Analysis

3.1. Correlation Between Gender Role Perceptions and Educational Attainment

Gender roles, deeply rooted in cultural and social norms, play a crucial role in shaping educational opportunities for women across different regions in China. Perceptions of gender roles in urban areas correlate with higher educational attainment among women compared to perceptions in rural areas.

DOI: 10.54254/2753-7064/40/20242344

Urban areas, characterized by more progressive views on gender, tend to offer women greater educational opportunities and higher levels of academic success. In contrast, traditional gender role perceptions in rural areas continue to restrict women's educational opportunities, leading to a persistent gender gap in education.

3.1.1. Urban Areas and Progressive Gender Role Perceptions

In urban areas, the perception of gender roles has shifted significantly over the past few decades, largely due to economic development, modernization, and increased exposure to global cultural norms. Deng et al. conducted a study in Beijing and Shanghai, revealing that urban women are more likely to reject traditional gender roles that confine women to domestic responsibilities [16]. Instead, these women are encouraged to pursue higher education and professional careers. The study found that urban women with more egalitarian views on gender are not only more likely to attend university but also to pursue postgraduate education. These progressive gender role perceptions are linked to higher levels of educational attainment, as women in urban areas face fewer social barriers to pursuing their academic and career goals.

A similar study by Chen and Wang examined the impact of gender role perceptions on educational aspirations among high school girls in Guangzhou [17]. The researchers found that students who perceived gender roles as flexible and non-restrictive were more likely to aim for higher education and professional careers compared to their peers with more traditional views. It highlighted the role of urban environments in fostering progressive gender norms, which, in turn, correlate with higher educational attainment for women.

3.1.2. Rural Areas and Traditional Gender Role Perceptions

In contrast, rural areas in China are often characterized by more traditional gender role perceptions, which can significantly hinder women's educational opportunities. Li et al. studied the educational experiences of rural women in Shaanxi province and found that traditional views, which prioritize male education and see women primarily as caregivers, remain prevalent [18]. These gender role perceptions contribute to lower educational attainment among rural women, who are often encouraged to marry and assume domestic roles at a young age rather than pursue higher education. The study found that rural women who internalized these traditional gender roles were less likely to complete secondary education and much less likely to attend university.

Moreover, Huang and Zhang conducted research in rural Sichuan, revealing that parents' perceptions of gender roles significantly influence their daughters' educational paths [19]. The study found that in families where traditional gender roles were strongly upheld, girls were often discouraged from continuing their education beyond middle school. These findings indicate that the persistence of traditional gender roles in rural areas is a key factor contributing to the gender gap in educational attainment.

3.1.3. Cross-Regional Comparisons

Comparative studies further illustrate the stark differences in educational outcomes between urban and rural women, driven by contrasting gender role perceptions. A comprehensive analysis by Wu and Xie compared educational attainment levels between women in urban and rural areas across multiple provinces [20]. The study found that urban women, benefiting from more progressive gender norms, had significantly higher rates of university enrollment and completion compared to their rural counterparts. The researchers attributed this disparity to the more restrictive gender role perceptions prevalent in rural areas, which limit women's educational and professional aspirations.

DOI: 10.54254/2753-7064/40/20242344

3.2. The Influence of Media on Women's Educational Ambitions

Exposure to progressive media is instrumental in shaping women's educational ambitions across both urban and rural regions in China. Media serves as a powerful tool for challenging and reshaping gender roles. Platforms such as television, the Internet, and social media play a pivotal role in presenting diverse models of successful, educated women, challenging entrenched gender norms, and inspiring them to pursue higher education. Media has the potential to bridge the educational gap between urban and rural women by providing the motivation and resources needed to overcome traditional barriers and pursue academic and professional success. Media exposure positively correlates with women's educational aspirations, broadening their worldview and offering access to information that may not be readily available in their immediate environment.

3.2.1. Impact of Media in Urban Areas

In urban China, where media access is more widespread, exposure to progressive media significantly influences women's educational goals. Li and Wang conducted a study on female university students in Beijing, finding that those who frequently engaged with media portraying women in empowered roles were more likely to pursue advanced degrees and leadership positions [21]. It highlighted that media exposure not only provided role models but also offered a sense of possibility and ambition beyond traditional domestic roles.

Similarly, Wu et al. investigated the relationship between media consumption and educational aspirations among high school girls in Shanghai [22]. The study revealed that girls who regularly consumed media content that featured strong, independent women were more likely to express ambitions to attend prestigious universities and enter competitive fields traditionally dominated by men. This suggests that media exerts great influence on redefining gender roles and expanding educational ambitions in urban settings.

3.2.2. Media's Role in Rural Areas

In rural China, where traditional gender roles are more deeply ingrained, the influence of media is even more pronounced. A study by Zhang and Liu explored the impact of media on girls' educational aspirations in rural Sichuan [23]. The researchers found that exposure to television programs and online content featuring successful women in various professions significantly increased the likelihood that these girls would aspire to continue their education beyond secondary school. It noted that media served as a critical counter-narrative to the traditional expectations of early marriage and domesticity, offering alternative pathways for young women.

Another supporting example is the research conducted by Chen et al. to learn the impact of social media on educational aspirations among rural girls in Guangxi province [24]. Social media platforms, particularly those focused on education and career development, provided rural girls with access to networks of like-minded individuals and information about educational opportunities. This exposure not only motivated them to pursue higher education but also equipped them with the knowledge and resources to navigate the application processes for universities, scholarships, and internships.

3.2.3. Cross-Regional Comparisons

A cross-regional study by Huang compared the influence of media on women's educational ambitions in both urban and rural areas of China [25]. While the overall impact of media was positive across both settings, the effect was more transformative in rural areas. This is because rural women typically have fewer role models and less access to information about educational opportunities, making media a vital source of inspiration and guidance. Rural women regularly exposed to progressive media were

DOI: 10.54254/2753-7064/40/20242344

not only more likely to pursue higher education but also more willing to challenge traditional gender norms within their communities.

3.3. The Role of Technology in Narrowing the Gender Gap in Education

Increased access to technology has been identified as a key factor in narrowing the gender gap in education between urban and rural women in China. Technology, particularly the internet and mobile devices, has revolutionized access to educational resources, enabling women in remote and underserved areas to engage in learning opportunities that were previously out of reach due to geographical and economic constraints. Technology is a powerful tool for promoting gender equality in education, offering new opportunities for learning and personal development that transcend geographical and economic limitations. Du et al. underscore the democratizing effect of technology on education, highlighting its role in bridging the urban-rural divide by providing rural women with access to online courses, educational materials, and information that can enhance their academic and professional prospects [26].

3.3.1. Impact of Technology in Urban Areas

In urban regions, where technological infrastructure is more developed, the impact of technology on women's education has been profound. A study by Zhao and Li on female university students in Beijing found that access to digital learning platforms significantly improved educational outcomes, particularly in STEM fields [27]. Urban women who frequently utilize online resources have higher tendencies to achieve higher academic performance and pursue advanced degrees in technology-related fields. Thus, technology not only supports educational attainment but also encourages women to enter traditionally male-dominated disciplines.

Additionally, Wang et al. examined the role of technology in promoting lifelong learning among urban women in Shanghai [28]. The study found that access to online courses and professional development platforms allowed women to continuously upgrade their skills and knowledge, contributing to greater career advancement and economic independence. This underscores the role of technology as a tool for both academic education and professional empowerment.

3.3.2. Technology's Role in Rural Areas

In rural areas with limited educational resources, technology plays an even more critical role in levelling the playing field. Research by Liu and Chen on rural women in Gansu province demonstrated that access to mobile learning applications significantly improved literacy rates and educational attainment among adult women [29]. The study found that rural women who regularly used these applications were apt to complete secondary education and consider further studies, despite the challenges posed by traditional gender roles and economic hardship.

Besides, a study by Sun et al. focused on the impact of internet access on the educational ambitions of girls in rural Yunnan [30]. The researchers found that access to online educational content and virtual classrooms significantly increased the likelihood that these girls would aspire to attend university. The study noted that technology provided rural girls with a sense of connectedness to the broader world, reducing feelings of isolation and reinforcing the importance of education as a means of social mobility.

3.3.3. Cross-Regional Comparisons

A comprehensive study by Zhang compared the role of technology in reducing the gender education gap in both urban and rural areas of China. The study found that while technology positively

DOI: 10.54254/2753-7064/40/20242344

influenced educational outcomes for women across all regions, its impact was particularly transformative in rural areas. The study highlighted that rural women who gained access to the internet and digital learning tools preferred to pursue higher education and engaged in self-directed learning, beneficial to narrowing the gender gap in educational achievements.

Ultimately, the evidence provided strongly supports the hypothesis that increased access to technology is instrumental in narrowing the gender gap in education between urban and rural women in China. Offering access to educational resources, online courses, and collaborative networks, technology empowers women—particularly those in rural areas—to overcome traditional barriers and pursue higher education. Technology is a powerful tool for promoting gender equality in education, creating new opportunities for learning and personal development that transcend geographical and economic limitations [31].

4. Conclusion

This study has explored the complex interplay between gender role perceptions and women's educational opportunities in urban and rural China. The research findings indicate that urban environments, characterized by more progressive gender norms, offer women greater educational opportunities and higher levels of attainment. In contrast, rural areas, where traditional gender roles are more entrenched, continue to limit women's access to education. Moreover, the influence of media and technology emerges as a critical factor in shaping women's educational ambitions and narrowing the gender gap. Progressive media serves as a powerful tool in challenging traditional gender norms and inspiring women across both urban and rural regions to pursue higher education. Similarly, increased access to technology has been instrumental in bridging the urban-rural divide by providing rural women with access to educational resources and opportunities that were previously out of reach. Despite these advancements, challenges remain. Traditional son preference and gender role expectations in rural areas continue to hinder women's educational achievements, underscoring the need for targeted interventions that address these deeply ingrained cultural norms. Additionally, while media and technology have the potential to narrow the gender gap, their impact is contingent on broader access and awareness, particularly in underserved regions.

It is important to note that this paper has analyzed the proposed hypotheses through a literature review and has not conducted empirical social research. Future research should focus on intersectional approaches that consider how factors such as ethnicity, socio-economic status, and disability intersect with gender to impact educational opportunities. Such research will be crucial in developing more nuanced and effective strategies for promoting gender equality in education across diverse contexts in China.

References

[1] *Lee, W. (1995)"Women's Education in Traditional and Modern China." Women ś HistoryReview, 4(3),, pp. 345–367, https://doi.org/10.1080/09612029500200092.*

[2] *Gao, M. (2017). The Development of Women's Education in China: 1911-2011. Shanghai Educational Publishing House, .*

[3] *Lu, Y., and Wei D. (2023)."Women's Education in China: Past and Present." SHS Web of Conferences, 152, ,p. 02001, https://doi.org/10.1051/shsconf/202315202001.*

[4] *World Bank. "World Development Indicators." World Bank Data, 2021, data.worldbank.org/.*

[5] *UNESCO. "Global Education Monitoring Report." UNESCO GEM Report, 2022, en.unesco.org/gem-report/.*

[6] *China Education Center. "China Educational Statistics." China Education Center, 2023, www.chinaeducenter.com/en/edu/statistics.php.*

[7] *National Bureau of Statistics. Statistical Yearbook ofChina. 2023, www.stats.gov.cn/tjsj/ndsj/.*

[8] *Liu, H., and Zhang, Y. (2021). "Gender Inequality in Rural Education: Challenges and Progress." Rural Education Review, 15(1), pp. 23-35.*

[9] Wang, Xiaojie, et al. (2020),"Son Preference and the Reproductive Behavior of Rural-Urban Migrant Women of Childbearing Age in China: Empirical Evidence from a Cross-Sectional Data." International Journal of Environmental Research and Public Health, 17(9), pp. 3221–3221, https://doi.org/10.3390/ijerph17093221.
[10] Wang, Y. (2022)."Women's Opportunity of Education in Rural China." Advances in Social Science, Education and Humanities Research, 637, pp. 1142-1145.
[11] Santoniccolo, F. et al. (May 2023),"Gender and Media Representations: A Review of the Literature on Gender Stereotypes, Objectification and Sexualization." International Journal of Environmental Research and Public Health, 20(10), pp. 5770–5770, https://doi.org/10.3390/ijerph20105770.
[12] Peláez-Sánchez, I.C. et al. (Nov. 2023),"Gender Digital Divide in Education 4.0: A Systematic Literature Review of Factors and Strategies for Inclusion." Future in Educational Research, 1(2), pp. 129–146, https://doi.org/10.1002/fer3.16. Accessed 19 Aug. 2024.
[13] "Gender in Chinese Philosophy | Internet Encyclopedia of Philosophy." Utm.edu, 2024, iep.utm.edu/gender-in-chinese-philosophy/#H6. Accessed 19 Aug. 2024.
[14] Qing, S. (July 2020),"Gender Role Attitudes and Male-Female Income Differences in China." The Journal of Chinese Sociology, 7(1), 8, https://doi.org/10.1186/s40711-020-00123-w.
[15] Zuo, X., et al. (2018)"Gender Role Attitudes, Awareness and Experiences of Non-Consensual Sex among University Students in Shanghai, China." Reproductive Health, 15(1), 15, doi.org/10.1186/s12978-018-0491-x.
[16] Deng, X., Li, Z., & Wang, F. (2018). "Urbanization and Gender Equality: The Impact of Progressive Gender Norms on Women's Educational Attainment in Beijing and Shanghai." Urban Education Review, 35(2), 145-160.
[17] Chen, Y., & Wang, H. (2020). "Gender Role Perceptions and Educational Aspirations Among High School Girls in Guangzhou." Journal of Gender Studies in Education, 28(1), 89-105.
[18] Li, X., Chen, J., & Liu, Y. (2019). "The Influence of Traditional Gender Roles on Educational Outcomes for Women in Rural Shaanxi." Rural Sociology Journal, 54(4), 367-385.
[19] Huang, L., & Zhang, M. (2021). "Parental Gender Role Perceptions and Their Impact on Daughters' Education in Rural Sichuan." Journal ofRural Education, 42(3), 225-240.
[20] Wu, J., & Xie,Q. (2022). "A Comparative Analysis of Educational Attainment Between Urban and Rural Women in China: The Role of Gender Role Perceptions." Asian Studies in Education, 44(3), 278-295.
[21] Li, X., & Wang, J. (2018). "Media Exposure and Women's Educational Aspirations: A Study ofFemale University Students in Beijing." Women's Studies International Forum, 68, 19-27.
[22] Wu, M., Zhao, Y., & Sun, L. (2019). "The Influence of Media on High School Girls' Educational Aspirations in Shanghai." Chinese Journal of Sociology, 5(3), 345-363.
[23] Zhang, L., & Liu, W. (2021). "The Impact of Media on Educational Aspirations among Rural Girls in Sichuan." Journal ofRural Studies, 83, 156-165.
[24] Chen, Z., Liu, Y., & Zhang, H. (2022). "Social Media and Educational Aspirations: The Impact on Rural Girls in Guangxi Province." Asian Women, 38(1), 23-40.
[25] Huang, Y. (2020). "Media's Role in Shaping Educational Ambitions: A Comparative Study ofUrban and Rural Women in China." Journal of Communication Studies, 35(2), 215-234.
[26] Du, H., et al. (2020)."Education and Gender Role Attitudes." Journal of Population Economics, 34 (2), pp. 475–513, https://doi.org/10.1007/s00148-020-00793-3.
[27] Zhao, P., & Li, Y. (2019). "Digital Learning Platforms and Academic Performance: A Study of Female University Students in Beijing." International Journal of Educational Research, 94, 56-64.
[28] Wang, H., Li, X., & Zhao, M. (2021). "Promoting Lifelong Learning Among Urban Women: The Role of Online Platforms in Shanghai." Journal of Continuing Education and Training, 38(3), 198-215.
[29] Liu,Q., & Chen, J. (2020). "Mobile Learning Applications and Educational Attainment Among Rural Women in Gansu Province." Journal ofRural Education, 42(1), 33-48.
[30] Sun, Y., Zhang, L., & Li,Q. (2021). "The Role of Internet Access in Shaping Educational Ambitions of Rural Girls in Yunnan." Journal of Digital Learning in Teacher Education, 37(4), 234-245.
[31] Zhang, R. (2022). "Technology and Gender Equality in Education: A Cross-Regional Study of Urban and Rural Women in China." Asia-Pacific Journal ofEducation, 42(4), 319-340.

Proceedings of 3rd International Conference on Interdisciplinary Humanities and Communication Studies
DOI: 10.54254/2753-7064/40/20242338

Analysis of Gender and Mental Health Differences

Zhulin Li[1,a,*]

[1]*University of Nottingham, Nottingham, NG7 2RD, UK*
a. smyzl11@nottingham.ac.uk
**corresponding author*

Abstract: With the rapid development of modern civilization, the increasing pressures of contemporary life, the fast pace of living, and the influence of social media, an increasing number of people are suffering from mental health issues. Mental health is an important aspect that everyone should be concerned about. Research has revealed that depression can significantly impact a person's professional and interpersonal skills, potentially affecting one's career trajectory. However, while both men and women face mental health issues, gender differences persist. Numerous studies have indicated that disparities exist in both brain structure and function between males and females. For instance, females may exhibit a greater advantage in emotional processing and social cognition, whereas males may demonstrate enhanced spatial cognition abilities. This study aims to explore gender differences in mental health across four factors. The result shows that, family intergenerational relationships have a greater impact on girls than boys. During their student years, interpersonal relationships within dormitories have a greater influence on boys. In the social sphere, women are more prone to depression than men. From a personal perspective, females are also more likely to experience negative emotions compared to males.

Keywords: gender difference, mental health, impact, Cognitive Differences.

1. Introduction

In recent years, the serious harm caused by mental health problems has aroused widespread concern in society, with growing awareness of the importance of mental well-being. According to a report from World Health Organization (WHO), depression affects at least 300 million people around the world, impairing their ability to work and cope with daily life [1]. This highlights the urgent need to pay attention to mental health and work towards achieving universal health coverage. At present, some children are faced with a lack of parental care and love, which has a negative impact on their psychological state, while others face excessive expectations that create significant psychological pressure. What's more, students may experience mental health challenges when dealing with interpersonal relationships, particularly when frictions arise due to differing approaches. In addition, after entering the workplace, people will suffer psychological trauma due to the pressure of work and external expectations. Finally, personal factors like mental resilience and self-esteem also influence one's mental health. While previous studies have focused on the serious psychological effects of these factors, they often lack a comprehensive analysis, such as whether there are gender differences in mental health status caused by these factors. Based on this, this paper attempts to explore gender and mental health differences. In the process of exploration, we can gain a more

© 2024 The Authors. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

DOI: 10.54254/2753-7064/40/20242338

complete understanding of the complexity of human mental health, and provide a scientific basis for formulating more effective mental health intervention strategies, such as promoting gender equality and inclusiveness, eliminating gender bias, rationally allocating resources to those in need, raising public awareness and encouraging people to seek psychological support.

2. The intergenerational relationships in the family

The first factor we are going to look at is the gender difference caused by intergenerational relationships in the family. Family factors mainly include parents' education mode, family structure, parents' expectation of children, family atmosphere and other related factors. Indeed, parental expectations, family dynamics, and other factors play a crucial role in shaping children's mental health outcomes. According to the research findings of Wang Jiwen et al. [2], emotional closeness and frequent interactions, which have a positive effect on mental health, show gender differences in depression scores of young and middle-aged people, which is reflected in that women benefit more from emotional closeness, while men benefit more from frequent interactions. From the perspective of emotional dimension, the effect of emotional closeness to the mother in improving of female mental health is significantly greater than that for male mental health. From the association dimension, the positive effect of frequent interactions with parents on women's mental health was significantly smaller than on men's mental health. Some left-behind children in remote areas and at an immature age need more care and attention from their families, and also need appropriate and effective communication guidance to stabilize their emotions. However, due to the influence of traditional gender concepts, rural elders usually give more care to boys than girls [3]. Therefore, gender differences in communication and interaction between parents and adolescent left-behind children after going out may contribute to gender differences in their mental health. Studies indicate that in terms of parent-child communication, the negative psychological impact of parents being absent on left-behind girls is greater than that on left-behind boys [3]. However, a high family socioeconomic status does not always result in a positive psychological impact on children. For example, some parents with high socioeconomic status have higher achievements and rich educational resources, so they will provide their children with a higher starting point, which means they have higher expectations for their children's education [4]. Parents' expectations can promote and strengthen children's achievement motivation, but excessive high expectations can negatively impact their mental health [5]. At the same time, these parents are unable to balance the relationship between work and family, and their focus is more on their careers, thus ignoring the feelings of their children, resulting in intense family conflicts. The study found that family conflict weakens the positive relationship between family socioeconomic status and adolescent mental health. It can be seen that the positive effect of family socioeconomic status on adolescents' mental health will be offset by family conflicts [6]. Therefore, family conflicts tend to be more prominent for male students, and the improvement of family economic status will cause more frequent conflicts in male students' families, which can affect their mental health. Girls tend to have higher psychological sensitivity [7]. On the one hand, girls are more aware of conflicts between their parents, and their mental health is more likely to be affected. On the other hand, when family conflicts occur, boys pay more attention to objective aspects such as the frequency and solution of conflicts, while girls pay more attention to the subjective cognition of the threat and responsibility of conflicts to themselves [8]. Therefore, it is easy for girls to have self-doubt and self-criticism. The dataset of the histogram is based on a survey conducted in 2014, which covers 1259 valid samples. From the figure 1, it can be seen that the proportion of girls with mental health problems is about 20% more than that of boys, which also demonstrates that the overall mental health status of girls is lower than that of boys.

DOI: 10.54254/2753-7064/40/20242338

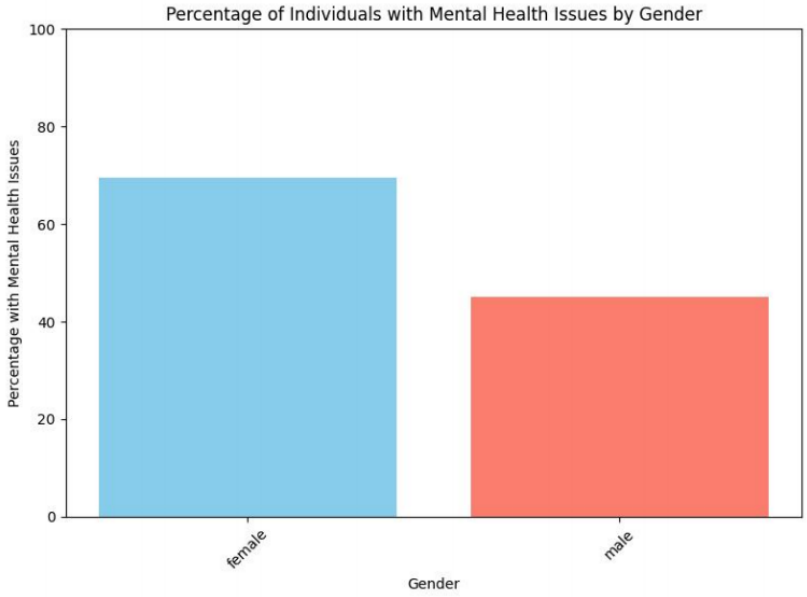


Figure 1: Percentage of individuals with Mental Health lssues by Gender

3. School factors

This section discusses the difference in the mental health states of male and female students during their time in school. According to Xiao Jianwei's research, personality and dormitory interpersonal relationship can both affect the mental health of college students, and personality factors can further affect the mental health of college students by acting on dormitory interpersonal relationships [9]. In a dormitory as a group, it is usually necessary for individuals to engage in some conformity behaviors for the unity of the group, which is conducive to a good dormitory relationship. However, once an individual fails to abide by the group norms, some conflicts may arise. It is found that there is a significant correlation and mutual influence between dormitory interpersonal harmony and mental health. A dormitory with low harmony tends to have members with lower mental health levels, while a dormitory with high harmony tends to have memvers with higher mental health levels [10]. However, due to the different physiological makeup, psychological traits and other factors, male and female students may experience difficulties in interpersonal communication when living together in the dormitory [11]. Relevant studies have pointed out that male and female students have significant differences in various factors of interpersonal relationships [12]. In contrast, girls are higher than boys in interpersonal intimacy, deep communication, active coping and importance cognition, while boys tend to ignore, evade or even intensify conflicts in dealing with interpersonal problems [12,13]. When girls have strong dormitory interpersonal relationships, their mental health levels do not increase rapidly, but remain relatively stable. However, the mental health levels of male students are lower than that of female students when they experience poor dormitory interpersonal relationships. Therefore, interpersonal relationships in male dormitories have a greater impact on their mental health [13].

4. Social factors

This section explores the differences in mental health between male and female students as influenced by social factors. Women may face gender bias and be treated differently in the job search process. Gender discrimination refers to unfair prejudice against a certain group because of their gender, thereby depriving them of their legitimate rights and interests. In the field of

DOI: 10.54254/2753-7064/40/20242338

employment, gender discrimination manifests as the unfair treatment of women, including restrictions and discrimination in areas such as promotion, salary, and the working environment. Although modern society has gradually become more accepting of women in the workforce, gender discrimination still exists in some fields and industries. First, it is often difficult for women to receive the same promotion opportunities and pay levels as men in the workplace. Some companies prefer to hire men in the recruitment process, believing that men are more capable and more suitable for senior management positions [14]. For example, in the fields of technology, finance and management, men dominate. Secondly, women often face more difficulties and pressure in their work. For example, balancing the demands of work and family life. However, under the influence of entrenched gender traditions, women are often expected to make professional sacrifices and concessions for family life, and this stereotype often forces them to be more cautious and conservative in their career choices. Women also suffer from gender discrimination and even sexual harassment in the workplace [15]. Women's biological differences may put them in vulnerable situations and lead to feelings of insecurity [16]. This can lead to more anxiety in women than in men. Occupational stress is positively correlated with anxiety and depression. When occupational stress becomes a long-term chronic experience, it may lead to psychological trauma, including symptoms of anxiety, exhaustion and depression in general [17]. Some studies have found that 75.86% of female managers experience occupational stress. Even after accounting for other factors, female managers with occupational stress remain at a higher risk of anxiety and depression [18]. Moreover, women face greater expectations and pressures across various fields of society. For example, rigid social standards often lead women to feel dissatisfied and anxious about their body image: due to the uncertainty of the future, they need to constantly learn to improve themselves to adapt to the workplace environment [19]. Studies have shown that depression and anxiety are related to occupational stress, and high levels of occupational stress can negatively impact mental health [20,21,22]. These expectations and pressures can make women more prone to mental health problems. As a result, women are more prone to depression and anxiety than men.

5. Psychological resilience

Finally, this paper studies individual self-evaluation and the adaptability in the face of frustrated. Studies have shown that adolescents of different genders have different levels of mental health, with mental resilience and self-esteem serving asdirect protective factors [23,24]. Psychological resilience is a dynamic process of development and positive adaptation under siginificant adversity [25]. It also reflects individuals' ability to cope with difficulties. The higher the psychological resilience, the less psychological pressure and tension in the face of adversity and difficulties, and the less negative impact adverse situations have on individuals [26]. Mental resilience is a direct protective factor for mental health [27]. High mental resilience can mitigate the negative emotions caused by negative events, reducing the occurrence of adverse mental health conditions and harmful health behaviors [28]. Other studies show that self-esteem positively predicts psychological resilience [26]. Self-esteem refers to an individual's overall positive self-evaluation and plays an important role in personal development [28]. Enhancing self-esteem and social support increases resilience in the face of stress and adversity, thereby effectively improving mental health [26]. In terms of mental health, girls are more likely to have problems such as academic pressure, interpersonal tension and sensitivity, depression, anxiety, obsessive behaviors and emotional instability than boys, which may be related to girls' lower levels of mental resilience and self-esteem compared to boys. Self-esteem has a stronger protective effect on mental health than resilience, and it can also affect the mental health level of middle school students through the mediating role of resilience [29].

DOI: 10.54254/2753-7064/40/20242338

6. Conclusion

This paper studies the different effects of four factors on the mental health status of male and female students. Insufficient family attention or excessive expectations can affect the health effects of adolescents, with a greater psychological impact on girls. In terms of the dormitory relationships, the mental health level of male students declines as the decrease of dormitory interpersonal relationships. In the process of job hunting, women face more pressure from all aspects than men, which leads to lower mental health levels. Additionally, from a personal perspective, girls generally exhibit lower levels of psychological resilience and self-esteem compared to boys, making them more prone to emotional instability. This study did not track the long-term psychological changes of left-behind children as they grow up. Future improvements should focus on establishing relevant departments to provide male and female students with corresponding psychological counseling, enhancing the management of occupational stress and creating more equal promotion opportunities for women. Future studies could explore differences in mental health levels in more detail in terms of age and different social statuses.

References

[1] *World Health Organization.(2017). Depression and other common mental disorders global health estimates.*

[2] *Wang Jiwen, Wu Xiaolan. The effect of family intergenerational relationship on mental health of middle-aged and young adults: gender difference and age pattern [J]. Population and Development, 2002, 28(06): 98-108.*

[3] *Li Xiaoxiao, Liu Yue, Zhou Dongyang, et al. Left-behind junior middle school students parent-child interaction and sex differences in mental health [J]. Journal of school health in China, and 2021 (6) : 876-878 + 882. DOI: 10.16835 / j.carol carroll nki. 1000-9817.2021.06.018.*

[4] *Yap MBH, Jorm AF. Parental factors associated with childhood anxiety, depression, and internalizing problems: a systematic review and meta-analysis*

[5] *Dai Yingying, Wen Yong, Zong Zhanhong. The effects of family environment on adolescents' mental health and gender differences [J]. School Psychology, 2019, 22(3): 203-212. (in Chinese) DOI: 10.19521 / j.carol carroll nki. 1673-1662.2024.03.004.*

[6] *Lewis AJ, Kremer P, Douglas K, et al. Gender differences in adolescent depression: differential female susceptibility to stressors affecting family functioning[J]. Aust J Psychol, 2015, 67(3): 131-139. DOI: 10.1111/ajpy.12086.*

[7] *Zheng Shanshan, Kong Yanhong, Li Feifei. The effect of parental relationship quality on adolescent depression [J]. School Psychology, 21, 19 (3) : 234-237. (in Chinese) DOI: 10.19521/ j.cnki.1673-1662.2021.03.009.*

[8] *Zhang Xin-He, LI Huan-Jia, Zhou Lin-Miao, et al. Feature perception of parental conflict and adolescent depression: the chain mediation role of cognitive evaluation and sense of control and gender differences [J]. Chinese Journal of Health Psychology, 2019, 31 (7) : 1114-1120.*

[9] *Xiao Jianwei. Research on the relationship between college students' personality, Dormitory interpersonal relationship and mental health [D]. Shijiazhuang: Hebei Normal University, 2005. (in Chinese)*

[10] *Huang Weidong. Investigation and reflection on the interpersonal harmony of college students' dormitory: Based on the research of Zhangzhou Normal University [J]. Journal of Zhangzhou Normal University (Philosophy and Social Sciences Edition), 2012 (3) : 176.*

[11] *Chi Lijie. An analysis of female college students' Dormitory Interpersonal Relationship in the New era [J]. Journal of Chifeng University (Chinese Philosophy and Social Sciences Edition), 2012 (3) : 87. (in Chinese*

[12] *HE Linjiao, Zhao Jianxin, Fang Su. Investigation on the status quo of dormitory interpersonal relationship of college students [J]. Chinese Journal of Health Psychology, 2013 (5) : 766. (in Chinese)*

[13] *Wang Shuhua, Su Tao. The influence of dormitory interpersonal relationship on mental health of college students: the moderating role of gender [J]. Journal of Lishui College,2022,44(04):102-108. (in Chinese)*

[14] *Fu Haixia. Research on employment support for women of childbearing age under the background of three-child policy [D]. Jinan: Shandong University, 2023, China.*

[15] *In the summer, Tong Gaofang. Problems and countermeasures of women's high-quality employment and entrepreneurship in the context of Chinese modernization [J]. Market Weekly, 2019,37(19):183-186. (in Chinese)*

[16] *Wang Yifan. Study on the correlation between workplace violence emergency response and mental health of health technicians in medical institutions and its gender differences [D]. Shandong university, 2023. DOI: 10.27272 /, dc nki. Gshdu. 2023.001163.*

[17] *Yu Shan Method. Evaluation and control of occupational stress [M]. Beijing: People's Medical Publishing House, 2018:197.*

[18] *Gu Yiting, Kou Zhenxia, Yu Changyan. Women managers tend to investigate and influencing factors of depression and anxiety analysis [J]. Journal of industrial hygiene and occupational disease, 2024, 50 (03) : 213-218 + 257. DOI: 10.13692 / j.carol carroll nki gywsyzyb. 2024.03.004.*

[19] *Sung JM, Kim YJ. Sex differences in adolescent mental health profiles in South Korea[J]. Arch Psychiatr Nurs,2020, 34(6): 563-571. DOI: 10.1016/j.apnu.2020.10.001.*

[20] *Li Y, Cheng Z, Fan H, et al. Epigenetic changes and functions in pneumoconiosis[J]. Oxid Med Cell Longev, 2022: 2523066.*

[21] *Rennie DL, Watson KD, Montiero AM. The rise of qualitative research in psychology[J]. Canadian Psy- chology, 2002, 43: 179-189.*

[22] *Chen J, Cao B, Wang F, et al. Mediating effects of self-efficacy, coping, burnout, and social support between job stress and mental health among young Chinese nurses [J]. J Adv Nurs. 2020, 76(1): 163-173.*

[23] *Liu Jing, Yang Xiaoyan, Yang Yang, et al. Analysis on the changes and influencing factors of mental health of rural left-behind junior middle School students in Zizhong County, Sichuan [J]. Chinese School Health, 2014,35 (11) : 1648-1653.*

[24] *Ye Man, Zhang Jingping. Analysis on influencing factors of mental health of 2406 rural middle school students [J]. Chinese Journal of Behavioral Medicine and Brain Sciences, 2010,19 (6) : 547-549.*

[25] *Luthar S S. (Ed.).Resilience and vulnerability: Adaptation in the context of childhood adversities. New York: Cambridge. 2003*

[26] *Xu Min, Xu Xiaoyan. Secondary specialized school students' resilience, the relationship between self-esteem and social support [J]. Chinese journal of health psychology, 2011, 12 (02) : 211-212. The DOI: 10.13342 / j.carol carroll nki CJHP. 2011.02.046.*

[27] *Huang Jie, Zhang Huiyong, Shang Shijie. The mediating effect of mental resilience on the relationship between mental stress and mental health of college students [J]. Psychological and Behavioral Research, 2014,12 (6) : 813-818.*

[28] *Sowislo J F, ORTH U. Does low self-esteem predict depression and anxiety? A meta-analysis of longitudinal studies[J]. Psychol Bull, 2012, 139(1) : 213-240.*

[29] *Yao Qiang, XU Huanyu, JI Yuanyi, et al. In southern sichuan rural middle school students' mental health and the relationship between psychological elastic self-esteem [J]. Journal of school health in China, 2017, 38 (10) : 1503-1506. The DOI: 10.16835 / j.carol carroll nki. 1000-9817.2017.10.019.*