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Design and Research on Vocabulary Teaching and Learning in International Chinese Education Classrooms Aided by ChatGPT

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Abstract

With the rapid development of artificial intelligence technology, ChatGPT, as a generative language model, shows great potential in the field of language teaching. Especially in business Chinese teaching, ChatGPT provides new ideas and methods for vocabulary teaching by virtue of its powerful language generation and comprehension ability. *New Silk Road: Advanced Business Chinese Comprehensive Tutorial 1*, as a business Chinese textbook for learners with intermediate or higher Chinese proficiency, covers various aspects of business activities. Among them, Unit 5 "Disputes and Arbitration", as an inevitable part of business activities, involves a large number of specialized vocabularies and expressions. This paper demonstrates the application of ChatGPT in vocabulary teaching in business Chinese classrooms from vocabulary categorization and explanation, derivation and expansion, and practice and application, in order to improve the teaching effect and learning efficiency. At the same time, it analyzes the problems of ChatGPT in vocabulary teaching in business Chinese classroom and puts forward suggestions and prospects to improve the quality of vocabulary teaching in business Chinese classroom.

Keywords : ChatGPT; international Chinese language education; vocabulary teaching

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Introduction

Under the background of global economic integration, the importance of business Chinese has become more and more prominent as a bridge connecting business communication between China and the rest of the world. With the in-depth implementation of the "One Belt, One Road" initiative, more and more international friends have begun to learn business Chinese, so as to be more skillful in the cross-cultural business environment.[1]As a business Chinese textbook for intermediate and advanced learners, *New Silk Road: Advanced Business Chinese Comprehensive Tutorial 1* not only covers all aspects of business activities, but also emphasizes cultivating learners' ability to use the language in actual business scenarios. However, the specialization and complexity of business Chinese vocabulary often become a big challenge for learners. Especially in the unit of "Disputes and Arbitration", traditional teaching methods often have difficulty meeting the needs of learners because it involves a large number of specialized terms in law, economics and other fields. Therefore, it is particularly important to explore a more efficient and flexible vocabulary teaching method. In recent years, the rapid development of artificial intelligence technology has provided us with new possibilities.ChatGPT, as an advanced natural language processing model, shows great potential in assisting teaching with its powerful language generation and comprehension capabilities. It is able to provide personalized teaching content according to learners' needs and levels, helping learners to better understand and master vocabulary.

At the "ChatGPT and Future Education"academic seminar salon held by East China Normal University, Professor Wu Zhihui of Northeast Normal University proposed:"ChatGPT will have a great impact on the traditional way of learning, which may marginalize the advantages of Chinese education and make it difficult to surpass machine learning."

The Application of ChatGPT in Vocabulary Teaching in Business Chinese Classroom

New Silk Road: Advanced Business Chinese Comprehensive Tutorial 1 is the advanced part of the comprehensive part of the "New Silk Road Business Chinese Series", which is suitable for learners who have reached intermediate level or above and wish to engage in business activities in China. The book is divided into eight units, each of which covers the main aspects of a certain business activity, aiming at improving the learners' ability to conduct business in Chinese. In the following, we will take Unit 5 "Disputes and Arbitration" as an example to show how to utilize ChatGPT to assist vocabulary teaching in this unit.

Vocabulary Screening and Organization

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For the topic of "Disputes and Arbitration", ChatGPT can quickly filter out vocabulary related to the topic, and organize and classify them. For example, dispute-related terms may include "dispute", "controversy", "disagreement", etc. Arbitration-related terms may include "arbitration", "arbitration agreement", "arbitral tribunal" and so on. Through the screening and organizing of ChatGPT, teachers can obtain the vocabulary resources needed for teaching more quickly.

The vocabulary section in *New Silk Road: Advanced Business Chinese Comprehensive Tutorial 1* is organized in such a way that the order of vocabulary appearances is consistent with the text, but vocabulary with different lexical properties is mixed and organized. Although this strategy reflects the convenience of time-saving and labor-saving teaching, it has weakened the intrinsic correlation between vocabularies to a certain extent. If teachers do not process the vocabulary appropriately in the teaching process and only teach them in isolation, it may affect the overall learning of vocabulary. Teaching strategies and methods should be focused on different vocabularies to ensure the effectiveness and systematicity of teaching. Sun Ruonan (2021) pointed out that "nouns tend to be stored in the mental lexicon in an aggregation reaction relationship, and verbs tend to be stored in a combination reaction relationship".[2]In teaching nouns, the teacher's focus should be on helping students to expand on similar words. [3]For example, when the teacher teaches the noun "apple", they should not only focus on the word "apple" itself, but should guide the students to think about what other words belong to the same category as "apple", such as "banana", "orange" and other fruits. In this way, students will learn more related words and their vocabulary will be enriched. Teachers can make students better understand and memorize these similar words by giving examples and classifying them, so that students' learning will be more comprehensive and systematic. As for the teaching of verbs, the teacher's task is to guide students to master the knowledge of linear collocation of verbs.[4]Linear collocation, in simple terms, means that when verbs are used together with other words, there are usually some fixed collocation patterns. For example, we often say "to eat" or "to eat fruit", but not "to eat books" or "to eat TV". or "eat TV". Teachers can familiarize students with these collocations through explanation and practice so that they will be more accurate and fluent in using the verbs. To help students memorize the vocabulary and collocations, teachers can encourage students to use mind maps. Mind maps are a very visual learning tool that can present the vocabulary and collocations graphically so that students can see the relationship between them at a glance. In this way, students can understand and memorize the vocabulary and collocations more deeply, and it can also stimulate their association and creativity.

Using ChatGPT to assist teaching, we can take the ten vocabulary words in the "Dispute" section of the unit "Dispute and Arbitration"as an example and adopt different teaching methods according to the different nature of the words. For example, using ChatGPT to generate example sentences for "cause" and "matter", "cause" is a verb, often with the bad results, in the teaching of the students, you can show the related words. When teaching students, it is possible to show relevant example sentences to help students understand. "Matters"is a noun with a strong written flavor. If simply explained, students may find it abstract to understand. Using ChatGPT to generate example sentences with synonyms of "matters" for word - to - word comparison can help students learn.[5]

Vocabulary Expansion

ChatGPT can provide detailed and accurate explanations for each screened vocabulary word, as well as relevant example sentences and usage. In addition, it can further expand related vocabulary and phrases according to students' learning needs, helping students to establish connections between vocabulary and form a vocabulary network. For example, for the word "arbitration", ChatGPT can not only explain its meaning, but also provide related information on arbitration institutions and arbitration procedures. Business Chinese vocabulary is characterized by being formal, mostly used in written form, and is mostly used in specific contexts to show business thinking. In the "Arbitration" section, the order of occurrence of vocabulary is also the order of the text, the teacher needs to summarize the words with related meanings and similar themes, and then expand them, so that the students can understand the meaning of the vocabulary in the comparison of vocabulary.

Teachers can use Xmind mind - mapping software to break the linear arrangement of new words and then classify new words with different themes to show the hierarchy between words.[6] At the same time, pictures help to understand the meaning of new words, which can help teachers to talk and expand vocabulary.

Vocabulary practice and testing

The principle of"intensive teaching and extensive practice"in Chinese classroom teaching requires teachers to help learners consolidate language input and output through a lot of practice. ChatGPT can design a variety of vocabulary exercises and tests, such as filling in the blanks, selecting and matching, to meet students with different learning styles and levels. ChatGPT can help students consolidate their vocabulary knowledge and improve their learning efficiency through immediate feedback and correction.

After teaching new words, teachers need to determine whether students can distinguish the differences between words, so teachers can use ChatGPT to write exercises to fill in the blanks with new words to test the learning effect of students.

Personalized learning support

ChatGPT can provide personalized learning support according to students' learning needs and interests. In vocabulary teaching, ChatGPT can provide targeted vocabulary exercises and explanations for students' weak links to help students overcome learning difficulties. For example, You have not grasped the word' arbitration agreement' firmly enough, so I suggest you read more relevant arbitration cases and articles to strengthen your understanding and memory.

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The shortcomings and limitations of ChatGPT in assisting vocabulary teaching in business Chinese class

language understanding and cultural differences

ChatGPT's performance in Chinese environment may not be as good as that in English environment, which is mainly because there are relatively few learning data in Chinese corpus, which leads to ChatGPT's limited ability to understand and generate Chinese. In addition, the complexidiyity and diversity of Chinese language, such as language structure, expression and cultural background, make it more difficult for ChatGPT to understand and deal with Chinese. Business Chinese involves not only the language itself, but also rich cultural connotations and business etiquette. ChatGPT may have misunderstandings or deviations in some words and expressions due to its lack of in-depth understanding of China culture. Some technical terms and idioms in business Chinese may be difficult to be accurately understood and translated by ChatGPT, thus affecting the teaching effect.

It is difficult to determine the accuracy of the assessment and there are factual errors

ChatGPT responses, while fluent and natural, may contain inaccurate or incorrect information. This will affect the assessment accuracy and effectiveness of vocabulary teaching. In business Chinese vocabulary teaching, teachers need to accurately assess students' mastery in order to adjust teaching strategies and methods in time. ChatGPT may not be able to provide such accurate and reliable assessment results. It should be noted that at the current stage, large - scale language models like ChatGPT cannot ensure the complete accuracy of the generated text. They may even distort the facts and produce erroneous information. The reason for this is that the limited Chinese corpus leads to the fact that ChatGPT's logical discriminative ability is not yet mature, so there are false statements caused by conceptual misuse or factual errors caused by knowledge blindness. For example, when ChatGPT was asked to identify the HSK levels of vocabulary in the vocabulary list, it was found that some of the vocabulary levels given therein were obviously wrong, so the answers provided by ChatGPT were questioned several times, and in the end, it was found that after each questioning, ChatGPT sincerely apologized and corrected its own answers from the beginning to the end. After many experiments, it was found that for non-common sense and highly specialized questions, ChatGPT's accuracy rate was not high, and factual errors were often made. For these types of questions, the answers generated by ChatGPT are random in nature, which means that for answers it is not sure of, ChatGPT will start answering randomly.

Outdated data and lack of real-time interaction

ChatGPT's pre - training data may contain outdated information, resulting in its inability to provide accurate and timely answers when answering questions involving the latest knowledge or dynamic changes. In business Chinese teaching, new vocabulary and expressions are constantly emerging as the market environment and business practices evolve, and ChatGPT may not be able to capture these changes in a timely manner, thus affecting the timeliness and accuracy of vocabulary teaching.ChatGPT's answers are based on pre - training data and algorithmic generation results, lacking real - time nature and interactivity. In a business Chinese classroom, students may need to communicate and discuss with the instructor in real time to gain a deeper understanding of vocabulary usage and context. And ChatGPT may not be able to provide such real-time interaction and feedback.

Lack of personalization and adaptability limitations

Each student has a unique learning style and needs. Although ChatGPT can provide a certain degree of personalized learning suggestions, it may not fully meet the individual needs of each student. This is because ChatGPT is an artificial intelligence product under the English discourse system of Western countries. Therefore, when conducting data analysis, it may be “forced” to simplify the complexity of the social environment due to the lack of corpus in other language environments, regarding Chinese learners from different countries as undifferentiated behavioral individuals and ignoring their personalized characteristics and mother - tongue backgrounds. For example, in business Chinese vocabulary teaching, students may need to conduct targeted learning based on their own weaknesses and interests. ChatGPT may not be able to provide flexible and personalized enough teaching content and strategies. ChatGPT's answers are based on the generation results of its algorithms and models, and may not be able to fully adapt to the learning progress and level of different students. In business Chinese class, teachers need to adjust and guide students according to their actual situation and learning progress. And ChatGPT may not provide this flexibility and adaptability.

For example, in ChatGPT“After the input of \Please predict the errors that Thai students who speak Thai as their mother tongue may make in the process of learning these Chinese vocabulary, ChatGPT cannot predict the specific types of errors and can only give some formulaic ubiquitous search results. However, these answers are full of a large number of uncertain expressions containing possible and cannot provide any specific and feasible reference opinions for our teaching activities.

Conclusion

Based on the background of the digital development of international Chinese education, combined with the qualitative analysis of a large amount of text information, this paper introduces the possibility of using ChatGPT to design vocabulary teaching content in business Chinese classrooms. By using ChatGPT to assist the vocabulary teaching of Unit 5 Disputes and Arbitration of *New Silk Road: Advanced Business Chinese Comprehensive Tutorial 1*, we can find that ChatGPT has

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significant advantages in improving teaching effects and learning efficiency, and can well help Chinese teachers in vocabulary teaching. It can quickly screen out relevant vocabulary, provide detailed explanations and expanded information, design diversified exercises and tests, and provide personalized learning suggestions according to students' learning needs. However, we should also pay attention to the limitations that ChatGPT may have in generating teaching content, such as limited professional knowledge reserves, lack of pertinence and effectiveness, etc.[7]Therefore, when using ChatGPT to assist teaching, teachers need to optimize and adjust based on the actual situation to ensure the optimal teaching effect. However, with the development and widespread application of artificial intelligence technology, we can expect in the future that the development of ChatGPT will gradually make up for the current shortcomings and play a greater role in the field of international Chinese education.[8]

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Leveraging AI to Ignite Innovation in Small and Medium Enterprises: Challenges and Opportunities

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Abstract

Small and medium enterprises (SMEs) are considered the backbone of most economies around the world, but they often find to be difficult to adapt to competitive pressures and drive innovation given their limited resources. Fast-paced developments in artificial intelligence (AI) is providing new opportunities for SMEs to reshape their operations, identify previously unexploited market segments and establish resilient business models. From automating repetitive tasks to generating predictive insights, AI can streamline decision-making and increase operational efficiencies. However, as we lean into the incredible promises AI holds, we need to approach its influence with caution ─ to embrace cross-sector collaboration, develop strong training, and advocate for policy frameworks that attract public and private investment in its future. This paper focuses on SMEs identified as early adopters of AI used specifically to promote innovation, as well as those facing challenges in achieving growth, exploring the potential opportunities AI presents. Strategies will be given as well at the end..

Keywords : AI; SMEs; Innovation; Competitiveness; Policy Supports

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Introduction

Small and medium enterprises (SMEs) are commonly referred to as the engine of the global economy as they provide massive employment and promote economic growth across many nations (Baabdullah et al., 2021). While they are the backbone of the private sector, SMEs face systematic challenges that affect their ability to innovate. Some of the biggest barriers are the lack of financial resources, limited access to advanced technologies and qualified workforce. Such constraints are not only likely to constrain the capacity of SMEs to develop competitive products but also represent substantial hurdles to the efficient implementation of innovative digital tools (Baabdullah et al., 2021). As a result, a gap exists as numerous SMEs lag behind more powerful commercial enterprises that are able to develop the capital, infrastructure, and know-how necessary to adopt next-generation technologies.

Concurrently, the fast-evolving landscape of Artificial Intelligence (AI) presents a pivotal opportunity for SMEs willing to leverage technology to bolster their competitiveness. AI powered technologies like Machine Learning (ML) and Natural Language Processing can process vast, usually unstructured datasets to extract valuable insights — which can aid organizations to make data-driven decisions (Schwaeke et al., 2024). For SMEs, this capability means real-world advantages, including being better able to predict market trends, recognize new customer needs, and optimize day-to-day operations. Furthermore, complex scenarios can be simulated with advanced computational techniques, allowing more accurate risk assessments and assisting in strategic decision-making (Baabdullah et al., 2021). Hence, AI has the potential to enable smaller firms to capitalize on lucrative opportunities, to pivot rapidly in response to dynamic market demands and to experiment confidently.

However, considering all of these on the bright side, the adoption of AI among SMEs is still rather low. One reason behind this is a widespread ignorance of AI and its use cases. Without a clear understanding of how AI tools fit into existing business processes, organizational leaders may be hesitant to spend precious resources on an uncertain investment. In addition to these, there are psychological and cultural dimensions at play, where resistance to change can postpone or destroy AI initiatives even when technological solutions seem to be achievable (Baabdullah et al., 2021). The resistance to changing long-standing ways of doing things is often a function of worries about whether the workforce is ready, whether operational continuity will be disrupted, and whether technology-related changes are worth the risk.

AI integration is not just a technical enhancement; it is a strategic imperative. As SMEs strive to maintain relevance in rapidly evolving markets, AI-driven innovations can bolster growth, foster resilience, and unlock new avenues for value creation (Schwaeke et al., 2024). As such, the comprehension and implementation of AI in SMEs becomes imperative to key

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players ranging from policymakers, industry executives to scholars seeking to optimize the full potential of AI to spur economic prosperity and societal well-being.

Research Purpose

This paper aims to analyze how AI can facilitate innovation in the case of SMEs which will lead to better competitiveness, thus contributing to sustainable growth in different markets. In particular, this study aims to analyze the process via which AI promotes innovation in SMEs, the likely organizational, cultural, and market changes that will occur as a result of AI incorporation, and the overall implications for stakeholders. In so doing, this paper aims to serve policymakers, business leaders, and researchers alike with meaningful insights into the distinct dynamics of AI adoption in the SME space.

One of the issues that has been highlighted in this investigation is the issues surrounding the barriers and opportunities of adopting AI. Common hurdles consist of lacking sufficient financial supports, knowledge gaps within the workforce, and potential psychological resistance to change—factors that can hamper the successful implementation of cutting-edge technologies. In contrast, opportunities emerge when SMEs leverage AI-driven solutions to streamline processes, enhance product offerings, and improve customer engagement. By examining these opposing forces, this paper emphasizes the necessity of developing unique strategies that align with the distinctive nature of SMEs, specifically their size and typically limited resources.

AI as a Catalyst for Innovation

Previous studies provide us with useful insights in this area. A study, for example, identifies the critical drivers and obstacles toward intelligent transformation in SMEs and presents a holistic framework model that encompasses the key challenges while providing CEO guidelines for action (Schwaeke et al., 2024). This model highlights the significance of internal preparedness, leadership dedication, and organized team collaboration. On the other hand, open innovation practices are crucial for successful innovation for SMEs (Radziwon & Bogers, 2019) as they create strong partnerships with other ecosystem members for knowledge sharing but also to decrease the risk from new, potentially disruptive technologies. By strengthening collaborative connections, SMEs are more likely to exploit AI's transformational capacity and enhance their capacity to administer, nurture, and maintain open innovation.

As described above, AI has quickly become a powerful innovation catalyst and a source of competitive advantage for SMEs in a globalized economy (Mariani et al., 2023). One of the most revolutionary features of AI is its potential to analyze large amounts of data to identify relationships or patterns, which may not be comparable with classical data analysis methods (Haefner et al., 2021). This approach enables SMEs to leverage AI-based algorithms to discover underrepresented customers, enhance current products, or develop innovative products that directly address the demands of the market (Soni et al., 2020).

ML algorithms that are tasked with analyzing customer behavior are a prime example of where AI adds genuine value. These algorithms can sift through dense, often unstructured datasets, surfacing nascent consumer trends or product pain points. The data-driven moves that an SME makes enable it to take its solutions to the next level beyond guessing its way through the maze to serve the customer in the way they want. Consequentially creating a virtuous cycle: better products, better experience →° higher customer satisfaction, more branded loyalty → more innovation.

Additionally, the ability of AI to simulate complex scenarios may be especially valuable in the context of SMEs that often work under tight budget and staff constraints (Mariani et al., 2023). While larger corporations might have the capacity to conduct extensive market research, SMEs cannot afford such large-scale market research costs. AI simulations, on the other hand, are an economical tool to evaluate products, processes, or strategic changes before investing heavily in physical implementations. AI models, for instance, can assess how various market conditions or supply chain disruptions might impact a new product launch. These insights enable SMEs to make better-informed decisions on everything from inventory management to distribution strategies, reducing risk and optimizing resource allocation.

Outside of market-facing functions, AI can be an internal innovation engine as well. By automating labor-intensive administrative tasks, for example invoice processing or basic customer support requests, SMEs can reinforce human capital in more strategic areas. The reshuffling of personnel and creative energy often leads to new ideas, faster workflows and happier staff, because team members can concentrate on value-additions rather than replication of routines. Overall, these AI-driven benefits highlight the importance of technology in fostering SMEs' success in fiercely competitive landscapes, enabling SEMs to stand on equal footing with larger firms.

AI and Interdisciplinary Research

AI's technical capabilities are certainly transformative, but in order to effectively unleash their full potential for SME innovation, an interdisciplinary lens that integrates social science perspectives, organizational behavior principles, and economic considerations is essential (Miller, 2019). SMEs which connect the dots across such diverse domains gather a more comprehensive understanding of the social and cultural forces influencing both internal and external innovation processes. For example, organizational culture often shapes how teams respond to new technologies; if employees view AI as a threat, they may resist its implementation, undermining many of its potential benefits. On the other hand, a culture of learning and experimentation will help to massively improve the chances of successful AI adoption.

It is evident from empirical results that social science methods not only help in understanding innovation drivers and barriers in SMEs, they are also supported by computational tools (Keuschnigg et al., 2018). Agent-based simulations, for instance, can illustrate the relationship between human judgement and AI-generated recommendations, and their effects on

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collaborative problem-solving. Furthermore, ML algorithms can be used to uncover patterns in social data — for instance, communication dynamics or employee sentiment — which can give SMEs a clearer view of potential pain points in the innovation process. When these insights are leveraged by leaders to enhance their management and engagement styles, they can create a more cooperative and psychologically safe atmosphere within their organizations. These measures are likely to help employees explore the new technologies in a safe environment.

Interdisciplinary collaboration can also bring clarity and credibility to AI-driven decisions — which is essential in establishing trust in stakeholders (Baum, 2021). Many of AI adoption's complex challenges—ethical questions, data privacy concerns, algorithmic bias—cannot be solved by a single discipline alone. Specialists in computer science, sociology, psychology and economics should be involved so that potential problems are considered from different perspectives. For example, psychologists can inform developers on how to craft AI interfaces that are inherently usable and user-friendly, which can make it easier to adopt. Sociologists might know of group dynamics or power structures that might discourage the acceptance of the technology, and economists will help measure cost-benefit trade-offs to guide the allocation of time and other resources.

Moreover, an interdisciplinary approach also helps ensure that any solutions based on AI are in line with social and cultural values, thus increasing their potential for success in the long run (Miller, 2019). AI is sometimes viewed skeptically in certain contexts, for instance, when local communities or small organizations fear that the technology will face job displacement or breach privacy. By incorporating sociocultural assessments at the outset of the design process, SMEs can develop AI implementations that are transparent, inclusive, and responsive to issues that community members may have. Aligning with regulation not only helps an SME avoid ethical pitfalls, but it also signals positive reputation and that it is committed to responsible innovation.

Finally, interdisciplinary research fosters a comprehensive view regarding the effect of AI adoption on the organizational dimensions of resilience and sustainability (Baum, 2021). SMEs must weigh not just the short-term technological benefits, but the long-term sustainability of the solutions they implement. A keen awareness of the economic context, the psychological effects on workers and the changing regulatory environment is vital to sustaining competitive advantage. Through synthesizing the strengths of various disciplines, SMEs are able to formulate AI-driven strategies that not only deliver core efficiencies and innovation, but are also ethically grounded, socially engaged and prepared for the uncertainties of future markets.

AI Applications in SMEs

AI has become a pivotal force in enabling SMEs to thrive in increasingly competitive markets. Through leveraging AI-based tools and techniques, SMEs can improve both their decision-making processes and efficiency while bringing new products and services to market faster. This part elaborates on AI applications, from data analysis to predictive analytics to process optimization to product development, and how lets SMEs stay agile and responsive in a fast-paced global economy.

Data Analysis and Insights

With AI-powered technologies, SMEs are spending much less time on data collection, interpretation, and analysis, offering a wealth of actionable insights (Hermann & Puntoni, 2024). Unlike conventional methods that tend to depend on manual or spreadsheet-style examination, AI-based platforms can rapidly measure great volumes of structured and unstructured data. These platforms make use of advanced algorithms to identify patterns, trends, and correlations that might be subtle to human analysts.

Such capabilities help SMEs develop a deeper understanding of their markets, competitors, and customers. For example, an SME specializing in consumer electronics could combine social media data, customer feedback and sales figures, and employ AI analytics to uncover which product features raise customer satisfaction most. Heading this knowledge, SMEs can align its marketing strategy and product roadmaps with consumer need. In addition, the AI-powered data visualization tools provide user-friendly dashboards that simplify the complex findings into an easily interpretable format for the decision-makers on all fronts of the organization, enabling the higher officials to interpret the key trends swiftly.

Crucially, AI-powered data analysis additionally allows for proactive decision-making in the face of ambiguity. By continuously monitoring fluctuations in consumer behaviors or market indicators, SMEs can identify emerging opportunities or risks early. These real-time insights are invaluable for crafting agile strategies that adapt to sudden shifts in customer preferences or supply chain dynamics. SMEs that embed AI analytics deep into their business operations will be able to respond more effectively to such changes and will thus enhance competitiveness and long term resilience.

ML Algorithms for Predictive Analytics

ML algorithms, tightly connected to data analysis, are an indispensable tool for predictive analytics in SMEs. ML models process historical data, social media trends, and external factors, e.g., economic indicators or weather conditions—to predict future market behaviors (Soni et al., 2020). This predictive capacity gives SMEs a level of foresight that was previously confined to large firms with broader research budgets.

Inventory management is one of the practical examples. B y integrating real-time sales figures with predictive algorithms, a retailer can anticipate product demand surges or dips and adjust stock levels accordingly. For instance, ML models may find a correlation between cold weather and higher sales of certain types of apparel items, driving the SME to stock these products

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ahead of time. Not only does this method help avoid expensive stock shortages but also reduces the pitfall of overstocking low-demand products.

In addition to inventory, predictive analytics can guide pricing strategies. Through analysis of historical promotional campaigns and behaviors of competitors, ML algorithms are able to identify prices that operate at a sweet spot between profitability and attractiveness to consumers. For instance, an e-commerce SME might decide to dynamically adjust prices based on real-time data, ensuring that it remains competitive without sacrificing margins. Additionally, SMEs can leverage AI to forecast broad trends, such as the emergence of new consumer segments, evolving customer tastes, or shifts in distribution channels. Such forecasts enable SME leaders to direct resources to research and development, marketing activities, or strategic partnerships.

Process Optimization

Other than providing insights on market trends, AI also has a strong solution for optimizing internal operations, ranging from manufacturing to logistics (Gao et al., 2024). Efficient use of limited resources is a pressing concern for many SMEs, and AI can help identify inefficiencies that might otherwise go unnoticed. AI-driven systems identify bottlenecks, analyze where improvements can be made, and provide recommendations based on data-driven insights, mining large datasets related to production workflows, supply chain movements, and quality control metrics (Toorajipour et al., 2021).

One key application is AI-guided scheduling. Automated systems can take machine availability, labor limitations and changing customer demand into account to develop optimal production schedules. This ensures that manufacturing processes operate as efficiently as possible, reducing downtime and waste of resources. AI can also facilitate just-in-time inventory management by predicting when raw materials are needed, minimizing carrying costs, and lowering the risk of shortages.

Credit also goes to AI in terms of quality assurance and predictive maintenance. AI-based sensors and field monitoring tools assess equipment performance in real time, identifying nuanced deviations that may signal an upcoming breakdown (Gao et al., 2024). A manufacturing SME can deploy these systems to monitor vibration patterns or temperature fluctuations in its machinery. Once signs of deterioration are identified, maintenance teams can intervene promptly, reducing both operational disruptions and long-term repair costs. In addition to that, delivering consistently high-quality builds greater customer satisfaction and venture reputation, which in turn will translate directly into the SME's competitiveness.

Product and Service Innovation

AI's ability to carry out in-depth analysis of massive datasets and uncover changing consumer trends presents SMEs with a unique opportunity to create considerably tailored products and services (Teng et al., 2022). ML techniques can be used by SMEs to filter out the insights from customer surveys, sales data and online reviews to identify emerging needs and use this knowledge to inform the design of new offerings. By minimizing guesswork involved in product development, this data-centric methodology enables quicker research and development (R&D) cycles, shortening time-to-market (Soni et al., 2020).

In addition, AI helps SMEs build a more personalized customer experience, an essential differentiator in competitive markets. Personalization can extend beyond marketing messages to include product configurations, delivery options, or after-sales support. For instance, An online service platform could deploy AI-powered recommendation engines that mathematically recommend personalized solutions based on the client's browsing history, location, or past purchases (Naeem et al., 2024). Such personalized approaches can lead to increased customer loyalty and repeat business, which can give SMEs a significant advantage.

AI also allows SMEs to innovate on business models. Instead of focusing on less customer-centric, one-size-fits-all approaches, smaller businesses can pursue niche strategies targeting specific customer segments. This emphasis on distinctive value creation is complemented by the ability of AI to rapidly churn out and test new ideas — for instance, by simulating how different customer personas might react to a potential new offering. By pairing these simulations with real-world feedback, SMEs can iterate on their offerings quickly — balancing agility and reliability.

Lastly, the application of AI in produce, it is possible each of the more sizable AI SMEs may form alliances that allow some of the division of labor, knowledge sharing, and market outreach (Teng et al., 2022). Ultimately, such collaborations can strengthen the innovation ecosystem, benefiting not only individual firms but also the broader economic landscape.

Challenges

Technical Barriers

One of the critical challenges for SMEs is that they lack the robust technical knowledge-how required to develop, deploy and maintain AI systems (Baabdullah et al., 2021). In contrast to larger corporations that have research and development teams, SMEs usually have limited internal resources making it challenging to understand AI technologies (Chan & Zary, 2019). In addition, incorporating AI into established workflows also necessitates more than simply programming and data science prowess; organizations must learn how to modify their processes to implement new digital tools.

This general lack of knowledge may be expressed in various ways. Small organizations may struggle to decide on the most suitable AI frameworks or ML libraries that suit their goals, for instance. Implementation can then stall due to compatibility issues between legacy systems and newer AI-driven solutions. Additionally, continuous upskilling is necessary to maintain and troubleshoot, placing further burden on SMEs, who already have a limited workforce. Organizations that neglect to develop

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or acquire such expertise will underutilize AI tools or scrap projects entirely, missing out on the transformative possibilities AI can provide.

Cost Constraints

AI adoption can carry a high cost for SMEs, both in terms of capital (one-off) and operational (recurring) costs (Peretz-Andersson et al., 2024). At the outset, firms need to pay for infrastructure — whether that be on-premises hardware or cloud-based platforms — that can handle large-scale data storage, high-velocity computing and specialized software licenses. Such upfront costs can be prohibitive, particularly for smaller companies that work on narrow profit margins.

In addition to infrastructure, the expense of hiring and retaining specialized staff—including data scientists, ML engineers and cybersecurity professionals—can add more strain on the budgets of SMEs. Salaries for AI professionals tend to be higher than the norm, reflecting the expertise needed for effective system design, training, and maintenance. Moreover, collecting data and training the models frequently involves stepwise updates or additions, leading to constant operational costs. Such financial burdens may deter SMEs from experimenting with AI, especially if they perceive an uncertain return on investment.

Adding more to this challenge is the necessity for resource allocations to be nimble. This has left many SMEs balancing the day-to-day expenditure associated with operations and the long-term capital outlay associated with implementation of AI. Leaders may be reluctant to devote further resources if cost-benefit analyses are lacking, or if AI projects take time to produce tangible benefits. This tension highlights the need for attention to financial planning and, where possible, external support mechanisms to lower barriers to entry.

Data Privacy and Security

In an era of heightened awareness about data protection, SMEs face increasing pressure to ensure that AI implementations comply with privacy regulations and minimize security vulnerabilities (Timan & Mann, 2021). Policies like the General Data Protection Regulation (GDPR) require strict standards for data processing, storage and consent processes. For SMEs without dedicated compliance departments or robust cybersecurity infrastructures in place, fulfilling these standards can be particularly draining.

If a SEM do not comply with the privacy and security obligations, the financial penalties, reputational damage, and loss of consumer confidence can be massive. In addition, the use of AI systems integrated with existing databases creates new points of vulnerability as algorithms often need vast amounts of data. Since these algorithms are computationally intensive, it becomes challenging to protect data while creating new systems. Protecting this data involves not just employing technical measures — like encryption and access controls but also organizational practices including thorough risk assessments and consistent employee training. By prioritizing privacy-by-design and robust security protocols, SMEs can mitigate these risks while still leveraging AI-driven insights.

Opportunities

Enhanced Innovation Capacity

However, these challenges do not dull the immense potential that AI brings with it, giving SMEs a unique, significant chance to increase their capacity for innovation (Babina et al., 2024). Many smaller firms are constrained by traditional research and development, lacking the budgets or specialized teams for such tactics as in larger companies. While the ideas alone are endless, AI-powered tools balance the scales by helping us discover new things efficiently and purposefully. By using sophisticated data analytics and pattern recognition, SMEs can identify developing trends, deal with unfulfilled consumer demands, and fast-track prototype product or service improvements.

This leap in innovation capacity can manifest in diverse ways. AI-powered algorithms can uncover overlooked consumer segments, identify underutilized distribution channels, and even generate interest in new business models. Further developments in easily accessible AI platforms enable non-experts within SMEs — sch as marketing managers or operations staff — to participate in data-exploitation projects. As a result, organizational creativity flourishes, and SMEs can break free from conventional paradigms, achieving what some researchers describe as “leapfrog development” (Babina et al., 2024).

Improved Competitive Advantage

A critical advantage of AI adoption is the edge it gives SEMs in a fast-evolving market. AI solutions provide SMEs with the ability to analyze large volumes of consumer data in real time, uncovering complex patterns of behavior that enable swift adjustment of strategies (Kopalle et al., 2022). Predictive analytics, for example, can highlight when consumer demand is about to surge, which groups of consumers are most price sensitive, and what competitors might do next. That sort of actionable intel leads to more strategic decision-making related to product design, promotional efforts and customer service (Wodecki, 2019).

This agility reinforces customer relationships and strengthens an SME’s position against larger, better-funded competition. In today’s digital landscape, the ability to pivot quickly can mean the difference between riding the wave of an emerging trend and losing ground to rival firms. Even a small investment can result in significant returns, such as improved responsiveness to the market, enhanced brand differentiation, and increased customer loyalty.

Access to New Markets

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Lastly, AI technologies can serve as catalysts for SMEs aiming to enter or expand in previously untapped markets (Babina et al., 2024). AI-enhanced market research tools can help SMEs identify consumer niches or geographic regions with under-fulfilled demands. These insights may originate from actuating patterns in online search data, social media conversations or aggregated e-commerce activity—sources of intelligence that would take far too long to sift through on the ground.

This makes scaling cross-border much more possible as well. Automation of translation tools, AI-enhanced localization services, and digital marketing companies may ease the scaling of SME asset classes to transnational customers, with a relatively low overhead through this technology. The kind of worldwide reach historically limited to the largest companies is now opened to smaller players with the proper use of AI. However, over time, displacement of these new markets can lead to diversification of revenue streams, increased brand recognition, as well as sustaining long-term growth, which are the key pillars for any SME to strive towards resilience in a complex economic environment.

Strategies for AI Integration in SMEs

Recognizing the interplay between the challenges and opportunities outlined above, SMEs must adopt deliberate strategies to ensure successful AI integration. These strategies encompass building internal capabilities, forging collaborative partnerships, and advocating for supportive policy frameworks.

Capacity Building

The first step for SMEs is developing AI literacy and investing in continuing education and services (Bettoni et al., 2021). Training initiatives can be raining initiatives can be offered in-house or through third-party programs, such as university-led workshops or online courses. Building capacity should also include forming cross-functional teams of employees with diverse backgrounds, working on AI projects. SMEs can bridge the gap by pairing domain experts (such as operations managers or product designers) with data scientists, encouraging knowledge transfer and adoption of a more holistic approach to AI. This cross-pollination of ideas provides a degree of assurance that AI tools created will be aligned with the firm's strategic goals and operational realities. Additionally, to encourage better exploration of AI-driven solutions, cultivating an environment that supports experimentation, and learning will make the process more achievable for employees.

Collaboration and Partnerships

One of the most powerful opportunities to address the resource limitations of SMEs lies in partnerships with academic institutions (Radziwon & Bogers, 2019). These collaborations allow SMEs to tap into state-of-the-art research, sophisticated lab facilities, and seasoned faculty experts. Collaborative projects could center on creating tailored AI algorithms that address particular business problems, like streamlining a supply chain or enhancing customer engagement analytics. But more than just the immediate technological benefits, these partnerships foster a culture of experimentation within SMEs as they learn from the iterative research processes inherent in academic environments.

Working with universities can also be a talent pipeline. Student internships, co-op programs, and research fellowships create mutually beneficial arrangements where SMEs gain fresh perspectives, while students acquire real-world experience. Gradually, these partnerships can also establish an SME as an innovative business, appealing to both talented employees and future investors.

Equally valuable are partnerships with large corporations that have already integrated AI into their operational ecosystems (Brazinskas & Beinoravičius, 2014). In such partnerships, SMEs can learn best practices around AI development, data management and scaled implementation. Larger companies may have mentorship programs, workshops, or technical support to bring the learning curve down for SMEs adopting AI. In certain instances, SMEs might even gain access to proprietary data, enhancing the training of more robust AI models.

Additionally, strategic alliances with established companies can open doors to broader distribution networks and marketing channels. By showcasing their AI-driven capabilities to a wider audience, SMEs can amplify brand visibility and capture market share more quickly. These synergies help both parties: large enterprises diversify their innovation portfolios by tapping into the agility of SMEs, while SMEs gain financial, technological, and reputational leverage.

Policy Support

Governments have to be part of the solution by making sure that they build an ecosystem in which SMEs can embrace AI. Well-designed policies can determine whether AI delivers transformative benefits or remains an underutilized resource. Targeted policy measures could, for example, take the form of direct-out financial incentives, like grants, tax credits and subsidized loans, to reduce the barriers to acquiring AI tools and expertise. These measures are crucial for SMEs that do not have large R&D budgets.

Policy frameworks can also direct ethical and sustainable AI adoption (Timan & Mann, 2021). For example, governments could stipulate guidelines that incentivize companies to create privacy-focused and sustainable AI systems. This also encourages social responsibility and sustainable practices in the long-term viability of SMEs when implementing AI technology, as they do this in a manner that promotes social good by trying financial support to the strategies of ethical implementation. Moreover, government-sponsored public-private partnerships can promote collaborative research, streamline technology transfer, and offer SMEs hands-on recommendations about compliance and security concerns.

Conclusion

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This has given rise to an emerging force — AI — that has great potential for SMEs globally. As emphasized in this paper, AI-based technologies—from data analytics and predictive models to process optimization and product development—can reinvent the ways SMEs are competing and growing in an ever more digital economy (Mariani et al., 2023; Soni et al., 2020). By capitalizing on AI's capacity to identify new market opportunities, enhance internal efficiencies, and drive product or service development, SMEs can position themselves alongside larger firms, despite often facing limited resources.

But it's not smooth sailing for SMEs looking to integrate AI successfully. Technical impediments like a lack of in-house expertise or the challenge of maintaining complex AI systems can hinder development (Baabdullah et al., 2021; Chan & Zary, 2019). High implementation costs and the need to comply with stringent data privacy and security regulations add layers of financial and organizational complexity (Timan & Mann, 2021). To overcome these challenges, SMEs must adopt a multi-pronged strategy. First, capacity-building initiatives that focus on employee education and cross-functional collaboration will be essential for establishing a strong foundation of AI literacy (Bettoni et al., 2021). Secondly, SME can leverage the alliances with the research institutions and large-scale enterprises help them in adaptation of advanced knowledge and the sharing of the data as well as the proven best practices (Brazinskas & Beinoravičius, 2014; Radziwon & Bogers, 2019). Last, supportive government policies—from financial incentives to ethical guidelines—can alleviate cost constraints and ensure AI adoption serves broader social objectives vs. just narrow corporate goals.

In the long run, a comprehensive approach that balances the technological, human, and regulatory dimensions of AI integration will be paramount. If used wisely, AI can be a motivator for innovation and market expansion, enabling SMEs to not just survive, but also flourish in an ultra-competitive commercial environment (Babina et al., 2024). Therefore, further research is recommended on how emerging AI approaches such as explainable AI or responsible AI frameworks can optimize outcomes for SMEs, while mitigating risks of bias, privacy infringement, and ethical dilemmas. By remaining agile, collaborative, and informed, SMEs stand to reap the transformative benefits of AI, securing their place as key drivers of employment, economic progress, and societal well-being.

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A study on the relationship between college students' coping styles and their outlook on love

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Abstract

This study examines the relationship between coping strategies for romantic breakups and the values associated with romantic relationships among college students. Utilizing a survey methodology, we collected data from 500 undergraduate students across various disciplines, focusing on their experiences with relationships and the aftermath of breakups. The results indicate that students who hold traditional romantic values tend to adopt avoidant coping strategies, such as denial and social withdrawal, when faced with breakups. Conversely, those who embrace contemporary views on relationships, which emphasize personal growth and emotional resilience, are more likely to engage in proactive coping mechanisms, such as seeking social support and engaging in self-reflection. This paper discusses the implications of these findings for counseling and support services in educational institutions, suggesting that fostering positive relationship values may enhance students' resilience in the face of romantic challenges. Furthermore, it highlights the need for targeted interventions that can equip students with effective coping skills, ultimately aiding their psychological well-being during difficult emotional transitions.

Keywords : college students; breakup coping strategies; romantic values; recovering from a broken love; types of coping strategies

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Introduction to the Prevalence and Impact of Breakups Among College Students

Prevalence of Breakups in College Students

The prevalence of breakups among college students is a significant area of concern within the realm of interpersonal relationships and mental health. Various studies indicate that between 50% to 70% of college students experience at least one breakup during their time in higher education. This high incidence can be attributed to several factors, including the transitional nature of college life, where students often encounter new social dynamics and relationship patterns.

Research shows that breakups commonly occur during the first two years of college, coinciding with increased independence and exposure to diverse social environments. The typical age range of college students, characterized by a search for identity and self-discovery, further exacerbates the volatility of romantic relationships. For instance, a study conducted on a sample of university students revealed that approximately 60% reported experiencing a breakup within their first year, with many attributing the dissolution to incompatibility and differing life goals.

The emotional impact of breakups on college students is profound, often leading to feelings of sadness, anxiety, and decreased academic performance. Surveys have documented that a significant percentage of students report a decline in their mental health following a breakup, with symptoms resembling those of depression. The stress associated with relationship loss can hinder academic pursuits and social interactions, contributing to a cycle of isolation and emotional distress.

Understanding the prevalence of breakups in this demographic is crucial for developing effective support systems within college settings. Institutions may benefit from implementing counseling services that address relationship issues, helping students navigate the emotional turmoil associated with breakups. Furthermore, educational programs focusing on healthy relationship practices and coping mechanisms could equip students with the tools necessary to manage their emotional responses to relationship losses effectively.

In summary, the high prevalence of breakups among college students highlights the need for increased awareness and support regarding the mental health implications of such experiences. Addressing this issue can lead to improved well-being for students and foster a more supportive campus environment.

Impact on Individual Mental Health

The impact of breakups on individual mental health among college students is profound and multifaceted. Research indicates that the emotional distress resulting from the end of romantic relationships can lead to significant psychological

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consequences. College students, a demographic often characterized by emotional volatility and identity formation, may experience heightened anxiety, depression, and feelings of loneliness following a breakup.

The emotional turmoil can manifest as a range of symptoms, from mild sadness to severe depressive episodes. Studies have shown that individuals who have recently experienced a breakup report higher levels of depressive symptoms compared to their peers in stable relationships. For instance, a longitudinal study found that students who underwent a breakup exhibited increased levels of hopelessness and a decline in overall life satisfaction in the months following the event.

Moreover, the stress associated with breakups can interfere with academic performance. College students may find it challenging to concentrate on their studies, leading to a decline in grades. This academic impact often exacerbates feelings of inadequacy and low self-esteem, creating a vicious cycle of emotional distress and poor academic outcomes.

Social support plays a critical role in mediating the effects of breakup-related mental health issues. Students who have a robust support system, including friends and family, are likely to cope better and experience less severe psychological impacts. In contrast, those who lack social connections may find themselves isolated, which can intensify feelings of depression and anxiety.

Our research found that in the absence of effective social support and motivation, our research mainly focused on the following aspects: first, in our experiments, we found some research on social support and motivation; second,, On the basis of theoretical research and experimental research, we found that in theoretical analysis and experimental research, our experimental results are that at both theoretical and practical levels, we hope to explore how to effectively to promote social health.

The significance of these mental health impacts extends beyond the individual. Poor mental health can affect interpersonal relationships, academic performance, and overall well-being, creating long-term consequences. Understanding the intricate relationship between breakups and mental health is essential for developing effective support systems and interventions for college students navigating these challenging experiences.

The following is an example of survey information about the relationship experiences and consequences of breakups among 500 undergraduate students from various disciplines.

Serial number	Subject Category	Love experience Number of people	Traditional view of love Number of people	Modern view of interpersonal relationships Number of people	Number of people breaking up	Avoidance coping strategies	Active response strategies	Level of demand for consulting support services
1	Literature and History	100	48	52	30	20	10	Higher
2	Science and engineering	120	35	85	40	15	25	Medium
3	Engineering	110	30	80	35	10	25	Medium
4	Medical	80	36	44	25	18	7	Higher
5	Art	50	21	29	15	10	5	Medium
6	Economic management	40	15	25	10	5	5	Medium
Total	——	500	180	320	155	73	82	——

Research has found that positive love values help college students adopt healthier ways of coping with breakup, while poor ways of coping with breakup may in turn affect the formation and development of their love values. This article also proposes corresponding educational intervention strategies to promote college students to form correct love values, improve their ability to cope with broken love, improve college students' psychological resilience, and provide theoretical support and practical guidance for mental health education in colleges and universities.

Significance of the Study

The significance of this study lies in its potential to enhance understanding of the relationship between coping strategies and coping styles among college students who experience breakups. Given that breakups are a common phenomenon during college years, this research addresses a critical gap in the literature regarding how these experiences affect individuals' psychological well-being and their perceptions of romantic relationships.

Understanding the coping mechanisms employed by college student's post-breakup can inform mental health professionals and educators about the support systems necessary for this demographic. It can lead to the development of targeted interventions that promote healthier coping strategies, ultimately fostering resilience and emotional recovery. For instance, if the study identifies that adaptive coping strategies significantly improve mental health outcomes, universities might implement workshops or counseling services that emphasize these methods.

Furthermore, this study explores the evolution of emotional perceptions and mental health status after a breakup. By studying these inner rules of love behavior and attitudes, insights can be gained into the long-term implications of romantic

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relationships on personal development. This aspect is particularly significant as it may reveal patterns that influence future relationship choices, commitment levels, and expectations in romantic partnerships.

Additionally, the findings could hold cultural relevance, offering insights into how different social contexts impact coping strategies and love values. This may contribute to broader discussions about relationship norms and expectations among diverse populations, enhancing cultural competency in counseling and support services.

Ultimately, the significance of this study extends beyond academic inquiry; it proposes to provide practical implications for mental health practices, educational programs, and societal understandings of love and loss among young adults. By bridging the gap between theoretical frameworks and real-world applications, the research stands to contribute meaningfully to the fields of psychology, sociology, and educational development.

Coping Strategies After Breakups Among College Students

Common Coping Mechanisms

Coping mechanisms employed by college students after breakups can vary widely, reflecting individual differences in personality, emotional resilience, and social support networks. Among the most common strategies, emotional expression stands out, where students articulate their feelings through journaling, talking to friends, or engaging in creative outlets like art and music. This method allows for the processing of emotions, facilitating a sense of relief and understanding.

Another prevalent coping mechanism is avoidance, which may manifest as distracting oneself through activities such as binge-watching television series, playing video games, or immersing in academic work. While this can provide temporary relief, it may also hinder the emotional processing necessary for long-term healing.

Social support seeking plays a crucial role in coping as well. Many students turn to peers or family members to discuss their experiences, which can provide validation and a sense of belonging. Studies have shown that those who actively seek social support tend to experience less distress and have a more positive outlook post-breakup.

Physical activity is also a common mechanism; exercising not only promotes physical health but also releases endorphins, which can enhance mood and reduce feelings of sadness. Engaging in sports or group fitness classes serves both as a distraction and a way to improve self-esteem.

Lastly, cognitive restructuring in educational intervention strategies is particularly important, is frequently utilized. Students may work to recontextualize their experiences, focusing on personal growth or lessons learned rather than solely on the pain of loss. This reflective practice can lead to healthier perspectives on future relationships.

These mechanisms reflect a spectrum of approaches, each with its own implications for emotional recovery and personal development following a breakup. Understanding the prevalence and nuances of these coping strategies is essential for developing targeted interventions that can support college students during these challenging transitions.

Effectiveness of Different Coping Strategies

Coping strategies employed by college students following breakups can significantly influence their emotional recovery and overall mental well-being. Various mechanisms have been identified in the literature, including problem-focused coping, emotion-focused coping, and avoidance strategies. Each of these approaches has distinct effectiveness levels depending on individual personality traits and the context of the breakup. However, appropriate educational intervention is crucial to improve college students' ability to cope with broken love and improve their psychological resilience.

Problem-focused coping involves actively addressing the issues arising from the breakup. This can include seeking closure through communication with the ex-partner or engaging in self-reflection to understand the reasons for the relationship's end. Studies indicate that this approach often leads to a faster emotional recovery as individuals feel empowered to take control of their circumstances. For example, students who engage in discussions with friends or family about their feelings tend to process their emotions constructively, facilitating a quicker return to normalcy.

Emotion-focused coping, Secondly, encompasses strategies aimed at managing emotions rather than addressing the breakup directly. This can include activities such as journaling, engaging in hobbies, or seeking social support. Research has shown that students employing emotion-focused strategies often experience initial emotional relief, which may not always translate into long-term recovery.

Avoidance strategies, on the other hand, including denial or substance use, can be detrimental to mental health. Although these methods may offer immediate relief from painful emotions, they can hinder the processing of the breakup and prolong distress. For instance, students relying on alcohol to cope may experience increased feelings of anxiety and depression as a result of neglecting to confront their emotions constructively.

In the long run, college students should be taught effective strategies and methods for coping with broken relationships, such as diverting attention, cultivating new interests and hobbies, strengthening social interaction, and engaging in self-reflection and growth. This enables them to have rules to follow when facing a broken love, take proactive actions, get out of the quagmire of broken love as soon as possible, and re-invest in study and life. What is more important is the cultivation of psychological resilience of college students. Long-term educational intervention can gradually cultivate the psychological resilience of college students, so that they can have stronger adaptability and stress resistance when facing love breakup and other setbacks and difficulties in life. College students with higher psychological resilience can face love breakup with a more optimistic and tenacious attitude, learn lessons from setbacks, and achieve self-growth and improvement.

Students with higher resilience tend to favor problem-focused coping, facilitating their recovery process. In contrast, those with lower self-esteem may gravitate towards avoidance methods, which can exacerbate their emotional turmoil.

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In summary, the effectiveness of different coping strategies among college student's post-breakup varies widely. Problem-focused coping generally yields better long-term outcomes, while emotion-focused strategies can provide temporary relief but may require supplemental approaches for complete recovery. Avoidance strategies often lead to adverse mental health consequences, illustrating the importance of selecting appropriate coping mechanisms.

Psychological Factors Influencing Coping Choices

The psychological factors influencing coping choices after breakups among college students encompass a range of individual traits and situational variables. One significant factor is emotional intelligence, which refers to the ability to recognize, understand, and manage one's own emotions as well as those of others. Students with higher emotional intelligence are often better equipped to process their feelings post-breakup, leading them to adopt more adaptive coping strategies such as seeking social support or engaging in self-reflection.

Personality traits also play a crucial role in determining coping mechanisms. For instance, individuals high in neuroticism may experience intense emotional reactions to breakups, often resorting to maladaptive strategies. Conversely, those who score high on traits such as openness or conscientiousness may utilize more constructive approaches like problem-solving and active coping. Research indicates that personality traits can significantly predict the effectiveness of coping strategies, with certain traits correlating strongly with adaptive outcomes.

Social support networks greatly affect coping choices as well. College students who perceive their social environment as supportive are more likely to engage in positive coping strategies. The presence of friends and family who provide emotional and practical support can buffer the negative effects of breakups, encouraging individuals to express their feelings and seek advice. In contrast, students who feel isolated may resort to unhealthy coping mechanisms, such as substance use or withdrawal from social interactions, exacerbating their distress.

Cognitive appraisal processes also influence how students perceive and react to breakups. A student's interpretation of the breakup situation can shape their emotional response and subsequent coping strategy. Those who view breakups as opportunities for personal growth may engage in more proactive coping strategies, such as setting new personal goals or exploring new relationships. In contrast, students who see breakups as catastrophic events might become stuck in negative thought patterns, resulting in avoidance or denial.

Finally, cultural and societal norms can influence coping choices. In cultures that emphasize emotional restraint, students may be less likely to express their feelings openly, leading to reliance on internal coping mechanisms. Conversely, cultures that encourage emotional expression and communal support may foster more adaptive coping strategies among students. Understanding these psychological factors provides valuable insights into the diverse ways college students navigate the emotional turbulence following breakups and highlights the need for tailored support interventions.

College Students' Love Values and Their Evolution Post-Breakup

Definition and Components of Love Values

Love standards refer to the beliefs and attitudes individuals hold regarding romantic relationships and the significance they attribute to love in their lives. These concept of love and encompass various dimensions, including emotional, moral, and relational aspects, which shape how individuals perceive and engage in romantic relationships. Understanding these components is crucial, particularly in the context of college students, who are in a formative stage of developing their relationship ideologies.

The emotional component of love involves the feelings and sentiments that individuals associate with love. This includes concepts of affection, intimacy, and commitment. College students often experience a tumultuous emotional landscape as they navigate romantic relationships, leading to the formation of unique emotional attachments and expectations. For instance, a student who values emotional intimacy may prioritize deep connections and vulnerability, while another may focus on excitement and passion, highlighting the diversity in emotional priorities among peers.

The moral dimensions of emotional ethics in love include, including fidelity, trust, and respect. These moral concepts can significantly influence relationship dynamics. Students who hold strong moral convictions regarding loyalty may find it challenging to cope with breakups, as their beliefs about fidelity can be deeply intertwined with their self-identity and relational expectations. In contrast, those with more flexible moral frameworks may adapt more easily to relationship changes, reflecting the variability in how love values can shape responses to relational challenges.

The relational aspect of love focuses on how individuals view and engage in romantic relationships. This includes attitudes toward dating, partnership roles, and the purpose of romantic involvement. For example, some students may view relationships primarily as a means of personal growth and exploration, while others may see them as essential for long-term companionship. These differing perspectives can influence not only the choice of partners but also the strategies employed to cope with breakups.

Furthermore, concepts and value standards in love are not static; they evolve over time, especially in response to significant life experiences, such as breakups. As students encounter the emotional fallout from lost relationships, their views on love may shift, leading to a reevaluation of what they seek in future partners. The interplay between these components underscores the complexity of love concept among college students, emphasizing the need for a nuanced understanding of how these beliefs shape relational experiences and coping mechanisms.

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In summary, love encompass emotional, moral, and relational components that collectively influence how college students view and engage in romantic relationships. These dimensions are vital in understanding the broader context of their experiences, particularly in relation to coping strategies employed during and after breakups.

Changes in Thoughts and Behaviors After a Breakup

The aftermath of a breakup often triggers changes in personal behavior dynamics and ideas, reflecting changes in perceptions, priorities, and emotional responses towards romantic relationships. College students, navigating the complexities of emerging adulthood, frequently experience these transformations as they reassess their beliefs about love and intimacy following the end of a relationship.

In the immediate aftermath of a breakup, students may initially experience a disillusionment with love. This disillusionment can manifest as a diminished belief in the ideals of romantic love, such as unconditional support and everlasting commitment. For instance, a student who previously held a romanticized view of relationships may become more skeptical about the feasibility of lasting love, influenced by negative experiences and emotional pain. This skepticism can lead to a more pragmatic approach to future relationships, prioritizing compatibility and shared values over idealistic notions of romance.

Moreover, the emotional turmoil caused by a breakup often results in a reevaluation of what constitutes a healthy relationship. Students may begin to emphasize the importance of self-care and personal growth over traditional romantic pursuits. A shift towards valuing independence and personal fulfillment can occur, as individuals seek to rebuild their identities outside of a romantic context. For example, a student who once prioritized partnerships may now focus on individual achievements such as academic success, self-exploration, and nurturing friendships.

The influence of social networks and peer dynamics also plays a critical role in shaping love values post-breakup. College environments foster a culture of shared experiences where students discuss their relationship histories, providing a platform for collective processing of breakups. Engaging with peers who have experienced similar challenges can lead to the adoption of new love values that emphasize resilience and emotional intelligence. This communal support can encourage individuals to redefine their expectations of love, moving towards values that prioritize mutual respect and emotional availability.

Cultural factors further complicate the evolution of thoughts after a breakup. Cultural narratives surrounding love and relationships, often perpetuated through media and societal norms, can influence how students perceive their experiences. For instance, narratives that glorify romantic love may clash with the harsh realities faced post-breakup, leading to a cognitive dissonance that prompts a reevaluation of one's beliefs. Students from collectivist cultures may also experience pressure to conform to familial expectations regarding relationships, which can lead to internal conflict and a redefinition of love values that balance personal desires with cultural expectations.

In summary, the changes in values after breakups among college students reflect a complex interplay of emotional, social, and cultural factors. These transformations often lead to a more nuanced understanding of love, characterized by a blend of skepticism and pragmatism, an emphasis on personal growth, and the influence of social interactions. As students navigate their post-breakup journeys, their evolving love values will significantly impact their future relationships and overall emotional well-being.

Influence of Cultural and Social Factors on Love

Cultural and social factors play a significant role in shaping love among college students, particularly after experiencing breakups. These influences can manifest through various mediums such as family expectations, peer interactions, and societal norms.

Family background often sets the foundation for an individual's understanding of love. Students raised in families where love is expressed through emotional support and open communication may adopt similar values, prioritizing emotional connection in their romantic relationships. Conversely, those from families with traditional views on love may emphasize stability and security over emotional fulfillment. This divergence can lead to contrasting reactions to breakups, with some individuals seeking to reaffirm their family’s values in their future relationships while others may choose to diverge, redefining their understanding the essence of love in light of personal experiences.

Peer influence also plays a critical role in shaping views on love. College environments are rife with social interactions that expose students to diverse perspectives on relationships. Friendships can lead to the exchange of ideas about love, often influencing an individual’s thinking ideas. For example, a student whose friends advocate for casual dating might adopt a more flexible view of relationships, leading to a reassessment of what they weight in love after a breakup. This shift can either promote resilience through a more adaptable view of romantic involvement or lead to confusion when navigating personal desires against peer expectations.

Societal norms and media representations significantly affect how love is perceived. In cultures that glorify romantic love, individuals may develop ideals that prioritize passion and intensity. However, the prevalence of breakup narratives in media can also instill a fear of vulnerability, pushing students to adopt defensive mechanisms in future relationships. Exposure to varying cultural contexts can encourage students to reflect on their own values, thus prompting a reassessment of what they deem essential in love. For instance, students who engage with cultures that emphasize collectivism may prioritize relationship harmony and family approval over individual desires.

Furthermore, the intersectionality of cultural identities can complicate college students’ views and attitudes toward friendship, family, and other emotions. College students from multicultural backgrounds may experience conflicting with each other due to their diverse heritage. After a breakup, this complexity may lead to a renegotiation of love emotional, and responsibilities of love. as they strive to integrate differing cultural expectations with their personal experiences.

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Overall, the influence of cultural and social factors how to make decisions in love is profound, with implications for how college students navigate their romantic lives post-breakup. Understanding these influences is crucial for developing effective support systems that address the emotional and psychological needs of students as they redefine their perceptions of love in a rapidly changing social landscape.

Relationship Between Coping Strategies and Love Values

How Coping Strategies Affect the Value Judgment and Orientation of Love in the Field of Love

Coping strategies adopted by college students after a breakup play an important role in shaping their perceptions, evaluations towards love. These strategies, ranging from emotional processing to engagement in distraction, directly affect how individuals conceptualize and prioritize love in their lives.

Emotional processing, which includes reflecting on feelings and understanding the breakup experience, often leads to a reevaluation of what love means to the individual. For instance, a student who actively engages in this strategy may come to value emotional support and communication more highly, recognizing these as essential components of a healthy relationship. This reflective process can result in a shift from idealistic notions of love to more pragmatic views, emphasizing compatibility and mutual respect.

In contrast, students who utilize avoidance strategies, such as denial or substance use, may struggle to develop a mature understanding of love. Avoidance can lead to unresolved feelings and an inability to learn from the breakup, potentially resulting in a devaluation of love altogether. Such individuals might adopt a more cynical perspective, viewing relationships as inherently problematic or transient, thus altering their future romantic engagements.

Social support also plays a crucial role in this dynamic. Students who seek support from friends and family often find themselves sharing and processing their experiences, which can reinforce positive love agency. For example, discussing the breakup with friends who prioritize healthy relationships can help individuals internalize similar emotional code, fostering a belief in the importance of trust and emotional intimacy.

Moreover, the nature of coping strategies can influence how students interpret their past relationships and their expectations for future ones. Those who engage in proactive strategies, such as seeking therapy or educational resources on relationships, are more likely to emerge from the experience with enhanced positive ideas about love that include self-love and the recognition of personal boundaries. This proactive approach often leads to healthier relationship dynamics in subsequent partnerships.

Coping strategies also intersect with cultural narratives surrounding love. Students from cultures that emphasize collectivism may lean towards coping strategies that reinforce family and community ties, which can shape there are ability to create happiness for love to prioritize long-term commitment and familial approval in romantic relationships. Conversely, those from individualistic cultures might focus on personal happiness and self-fulfillment, resulting in that prioritize personal preference over communal expectations.

Overall, the interplay between coping strategies affects the value judgment and orientation of love in the field of love is complex and multifaceted. The strategies employed by college students in the aftermath of breakups can lead to profound shifts in their understanding of love, influencing not only their immediate emotional recovery but also their future romantic endeavors. Understanding this relationship is essential for developing interventions that support healthy emotional processing and value formation in the wake of relational disruptions.

How Emotional Communication and Mutual Understanding in Love Influence Coping Strategies

The relationship between communication and mutual understanding and coping strategies in love is complex and multifaceted, which encompass beliefs and attitudes towards romantic relationships, significantly influence how individuals respond to the distress of breakups. Students with strong idealistic concept attitude, for instance, may perceive breakups as catastrophic events, leading them to engage in maladaptive coping strategies such as denial or rumination. These individuals tend to cling to the hope of rekindling the relationship, which can prolong their emotional suffering.

Conversely, students who prioritize practical, rational attitudes and ideas about love often adopt more constructive coping mechanisms. They may focus on problem-solving and actively seek social support, allowing them to process their emotions effectively. This pragmatic approach can lead to a quicker recovery from the emotional turmoil associated with breakups. For example, a student who values companionship and mutual support may lean on friends and family to navigate the pain of separation, thus facilitating emotional healing.

Moreover, the evolution of love expectations post-breakup can lead to a shift in coping strategies. Following a breakup, individuals may reassess their beliefs about love and relationships. A student who once held unrealistic expectations about romance may develop a more nuanced understanding, which can encourage healthier coping strategies in future relationships. This shift can manifest in behaviors such as engaging in self-reflection, seeking personal growth, or adopting a more balanced view of romantic partners.

Cultural and social influences also play a significant role in shaping how meaning of love impact coping strategies. For example, students from collectivist cultures may prioritize family and community support during a breakup, leading them to adopt coping strategies that involve seeking help from their social networks. In contrast, students from individualistic cultures might focus on self-reliance, resulting in coping strategies that emphasize personal resilience.

In summary, Emotional communication and mutual understanding in love have a great impact on the way college students cope with breakups. The interplay between these concept and coping strategies underscores the need for targeted interventions

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that consider individual belief systems regarding love and relationships. Understanding this relationship can help mental health professionals develop effective support mechanisms for students navigating the emotional challenges of breakups.

Improving Psychological Resilience of College Students Through Coping Strategies

Definition and model of mental toughness

Psychological resilience refers to an individual's positive adaptability in the face of adversity, including the interaction of an individual's internal traits and external support systems. The definitions of mental toughness are mainly divided into result definitions, process definitions and quality definitions. Models of psychological resilience include systems models and dynamic models that emphasize the interaction of internal and external factors within the individual. Falling out of love has many negative impacts on the mental health of college students, including depression, reduced self-worth, and social withdrawal. However, college students with higher psychological resilience can better cope with the psychological challenges caused by love breakup, showing faster recovery and better psychological adaptability. Research shows that psychological resilience is closely related to personal growth after a breakup. Individuals with high psychological resilience are more likely to achieve personal growth and psychological recovery after a breakup. Strategies to improve the psychological resilience of college students.

How to Implement Educational Intervention

School education level: Colleges and universities can incorporate lovelorn coping education into the mental health education curriculum system, offer special lectures, elective courses or workshops, and systematically explain the psychological mechanisms, coping strategies, etc. to college students. At the same time, make full use of campus media, bulletin boards and other channels to popularize knowledge on coping with lovelorn relationships and create a positive campus cultural atmosphere.

Professional counseling: The school psychological counseling center should be equipped with professional psychological counselors to provide one-to-one counseling services for college students who have lost love. Through professional skills such as listening, empathy, and guidance, counselors help students deeply explore their inner world, solve the psychological problems caused by broken love, and formulate personalized response plans.

The Setting of Emotional Education Classroom

Set up the goal of emotional education. The goal of emotional education is to help students understand and manage their emotions, cultivate positive emotional attitudes, and enhance emotional resilience. Psychological counseling courses and emotional education modules can be incorporated into university teaching plans as public required courses or elective courses, allowing more college students to participate in classroom discussions.

The specific goals of emotional education include recognition of emotions (helping students identify and understand their own emotional states,), emotional expression (encouraging students to express emotions healthily and avoid suppression and over-expression.), and emotional regulation (teaching students effective emotions Regulation skills, such as relaxational transfer, etc.), emotional support (establishing an emotional support system to enhance students' sense of social support.)

Conclusion

In summary, the interplay between coping strategies and love values is a dynamic process that evolves with personal experiences, social influences, and cultural context. If psychological counseling courses and emotional education modules are effectively set up in university classrooms, college students' psychological toughness and emotional management abilities can be significantly improved and their all-round development promoted. These courses mot only help students cope with academic and emotional stress, but also provide them with a solid foundation for future life and career development. This article provides theoretical support and practical guidance for mental health education in colleges and universities, helping college students to better recover and develop after a breakup.

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The triple interpretive spaces of otome games: Taking Light and Night as an example

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Abstract

In the digital - intelligent era, otome games create a simulated love experience that combines "immersion" and "interaction", forming complex and diverse interpretive spaces. Taking Light and Night as the research object, its interpretive space can be divided into three levels: "Dasein", "Mitsein", and "public". The interpretive spaces of "Dasein" and "Mitsein" interact with each other, and the rationalization principle of the "public" interpretive space ensures the orderly construction of the entire interpretive system. In - depth study of these three - fold interpretive spaces helps to comprehensively understand the value and significance of otome games in contemporary culture.

Keywords : Otome games; Interpretive spaces; Light and Night

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Introduction

The Space of "Dasein": Individual Imagination and Immersive Interactive Experience

In the digital - intelligent era, otome games present multi - modal and multi - media narratives. Taking Light and Night as an example, its narrative is generated in a simulated manner. Players, as "Dasein", have a generative understanding of the narrative. Players pursue love subjectivity and personalization in the game and achieve self - understanding through imagination. This process relies on the dual construction of "immersive poetics" and "interactive poetics", with "immersive poetics" providing an immersive space and "interactive poetics" enhancing interactivity.Together, they promote players' imagination, enabling players to obtain unique emotional experiences in the game and achieve a transformation from a passive to an active role.

The digital - intelligent era is a new economic era characterized by digitalization and intelligence. With the in - depth development of this era, the text narratives of video games exhibit multi - modal and multi - media characteristics. "Modality" refers to the semiotic resources for meaning production. Images, texts, music, etc. in video games are all manifestations of it. "Multi - media" means the use of multiple media for narrative. As a product of the digital - intelligent era, the textual narrative of otome games is an interweaving of multi - media and multi - modality. Otome games represented by Light and Night have the characteristic of simulated narrative generation. The narrative texts in the game are not in a fixed and completed state but need to be generated by players through practice. Even the main - line narrative is presented through the embodied interaction of players' fingers, while side - line narratives and specific card - based narratives construct overlapping narratives like puzzles.If the main - line world is regarded as the real world, then other narrative texts are possible alternative worlds. This stack - type narrative nested structure shows fictional, developing, and generative narrativity, making the understanding of game narratives by "Dasein" present a dynamic, flowing, and constantly - generating characteristic.

Essentially, the interpretation of otome games by "Dasein" is an imaginative creation. Paul Ricoeur elaborated, in his theory, on the important creative function of imagination in the narrative process.. He proposed the concepts of "prefiguration", "configuration", and "refiguration" in narrative. The imagination of "Dasein" is mainly reflected in the "refiguration" stage. In this stage, the player's personal horizon and the game's text horizon collide and converge, and finally, horizon - fusion is achieved. Through this fusion, players can endow the game narrative with new meanings by virtue of their imagination and achieve the "appropriation" of the meaning of the game text. Here, "appropriation" does not mean physical possession but a spiritual understanding and creation. Players integrate their emotions, experiences, and cognitions into the game text through imagination, making it a part of their unique experiences. The game text itself has the characteristic of openness, which provides a broad space for players' imagination. As Paul Ricoeur put it, only by losing oneself as a reader can one discover who one truly is. It is the reader who guides one into the realm of one's imaginative transformation. The transformation of the context that exerts an influence is, in essence, the transformative impact of the self. When players face game texts full of possibilities, fluidity, and awaiting generation, they lose themselves, constantly break through their original cognitive limitations, and then rely on their rich imaginations to explore and construct their own interpretive spaces in the game narrative.

Through imaginative creation, players make the game narrative a carrier of their unique emotional experiences. The emotional understanding of "Dasein" is the core way to reveal the interpretive meaning of otome games. The narrative

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environment constructed by otome games is like a unique time - space journey. Players, different from those in the passive viewing mode of traditional linear experiences, can deeply integrate into the game through the interaction between their fingers and the screen. They can personally experience the emotional changes in it, transform from passive viewers to active participants, and gain a unique emotional experience. Contemporary women actively pursue emotional subjectivity in otome games, firmly take control of the emotional development, give full play to their creativity to add unique colors to their love stories, and persistently pursue personalization, writing unique emotional chapters in the virtual world. This is a unique imaginative understanding of otome game narratives by women, vividly demonstrating their strong pursuit of subjectivity, creativity, and personalization in emotions.

The emotional interpretive meaning of "Dasein" in otome games is closely related to individual imagination, which is inseparable from the dual construction of "immersive poetics" and "interactive poetics". On the one hand, there is the construction of "immersive poetics". The narrative texts in otome games must provide a space for players to immerse themselves in. Players need to immerse themselves in the game narrative, believe that everything is true, and then start to imagine. Therefore, immersive poetics is the premise for constructing imagination.On the other hand, there is the construction of interactive poetics. As love - simulation games, otome games require interactivity, and the imagination of "Dasein" must unfold in interactive poetics. Light and Night has set up simulation communication systems such as mobile phone calls, real - time text message chats, and friend circles. On special festivals such as the Mid - Autumn Festival, Spring Festival, Valentine's Day, or the player's birthday, the male characters will talk to the players through the mobile phones in the game. They can even make a real - world call across the dimensional wall through the player's bound mobile phone number. The high degree of interactivity enables the imagination of "Dasein" to unfold better.

In the interpretive space of "Dasein" in otome games, "Dasein" explores itself in the simulated and generated narrative through imagination and generates in - depth emotional experiences through immersive interaction. When "Dasein" moves towards "Mitsein", it ushers in the second - level interpretive space of otome games, that is, the interpretive space of "Mitsein".

The Realm of "Mitsein": Collision of Multiple Discourses and Practical Influences

Heidegger regarded "Mitsein" as the basic structure of "Dasein"'s existence, emphasizing that "Dasein" exists together with others in the world. "The being of Dasein is being - with" and "The solitude of Dasein is also being - with in the world", revealing the interdependent co - existence relationship between the self and others. Gadamer further expanded the connotation of "Mitsein" by understanding it as participation, endowing "Mitsein" with a richer meaning.In the context of otome games, from Dasein to Mitsein, it means that players move from the individual to the group and try to seek self - identification and value confirmation in the public space.

From the dimension of online interaction, the interpretive discourses of "Dasein" in otome games do not exist in isolation but are intertwined and influence each other with the interpretive discourses of other "Dasein".

The Internet provides a broad platform for the "Mitsein" interpretation of otome games, with APPs such as Xiaohongshu, Weibo, and Douyin becoming the main places for players to express their views on games. Players directly share their opinions on game plots, characters, and other aspects, hoping to obtain understanding and recognition from others. For example, players will analyze the plot development of a certain chapter in Light and Night on Weibo or evaluate the character - building of a certain character and start discussions with other players.

At the same time, "fan narrative" presented in an aesthetic way is also an important form of online interactive interpretation. Creations such as fan fiction, fan comics, fan music, and Fan video editing have emerged in large numbers on platforms such as Bilibili, LOFTER, and AO3, and even spawned related occupations such as cosplayer commissions and language - cosplay teachers. These fan narratives express players' unique understandings of the game text through "modifications" or "expansions" of the game text. Moreover, the intertextual relationship between multiple fictional worlds greatly enriches the connotation of "Mitsein" interpretive discourses. However, this kind of creation needs to follow the principle of identity of the game text.For example, the situation of character setting collapse will trigger disputes among the player group. The interpretive discourses of "Mitsein" attempt to influence other "Dasein" through various forms of expression in this process, aiming to reach a consensus on the understanding of the game. This process needs to be carried out within a rational framework; otherwise, it is likely to cause chaos.

From the dimension of offline practice, the interpretation of "Mitsein" gradually extends from online discourse expressions to real - life behavioral practices.

The ideological and utopian concepts, proposed by Paul Ricoeur as social imaginaries, are clearly reflected in the offline practices of otome games. Some elements in the game form specific ideologies that influence players' consumption behaviors. For example,It has become a trend for players to pursue collecting all the cards. Some players, influenced by this, invest a large amount of money in purchasing card packs to collect more cards. This behavior not only drives game consumption but also forms a specific consumption culture within the player group. Co - branded activities related to otome games and the consumption of peripheral products are also important parts of offline practices. The prices of some co - branded products are much higher than their actual use value. However, players still purchase them out of their love for the game and emotional sustenance for virtual characters. Behind this consumption behavior lies the influence of commercial narrative discourses on players. They utilize the emotional resonance formed by players in the "Mitsein" interpretive space to tempt players to carry out consumption.

In addition, the "otome game self - shippers" phenomenon is a relatively extreme example in offline practices. "Otome game self - shipper" create self - designed characters and immerse themselves in emotional relationships with virtual characters. They extend the emotional experiences from the virtual world to a behavior pattern in real life, constructing a utopian fantasy

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world of their own in reality. Some otome game dream girls regard the relationship between themselves and game characters as a unique and private emotional bond, showing strong exclusivity.They reject others' affection for the same character, believing that it will interfere with the uniqueness and purity of their emotions. They worry that in comparison with others, the depth of their emotions for the character will be weakened. At the same time, they fear that different interpretations of the character by others will deconstruct the idealized character image they have built in their personal fantasies. This vividly reflects the impact of the "Mitsein" interpretive space on players' practical actions.

The collision of multiple discourses and practices of "Dasein" forms the "realm of Mitsein", that is, the collision of multiple discourses and practices related to love among contemporary women. The "realm of Mitsein" also influences the construction of the "space of Dasein". In the limited - edition card plot "Everlasting Reunion" in Light and Night, the female protagonist spends a warm Spring Festival with Sariel at his home. At the end of the plot, Sariel asks her, "Did you come here to make me happy?" Instead of answering along his line of thought, the female protagonist replies, "I came for myself. Although there are various things, I also want to enjoy the reunion with Sariel." This response is not accidental. It is the result of the game developers fully considering the current players' pursuit of equal love for women. When creating the game text, they deeply integrated the players' expectations for equal love in their personal horizons with the game text horizon. The female protagonist's answer demonstrates women's independent consciousness and autonomous choices in romantic relationships, conforming to the concept of equal love for women advocated at the "Mitsein" level. It reflects that under the influence of the "Mitsein" interpretive discourses, game text creation actively absorbs players' personal horizons, which is a vivid manifestation of the discourse construction in the "realm of Dasein".

The "space of Dasein" and the "realm of Mitsein" form the hermeneutic circle, presenting a dynamic process of meaning generation. However, while the online space provides a broad space for the "Mitsein" interpretation, it also brings the risk of out - of - control interpretive boundaries. With the continuous expansion of the "Mitsein" interpretive realm, how to define and maintain the boundaries of otome game interpretations to ensure that the infinitely expanding meanings still have value has become an urgent problem to be solved.

The "Public" Dimension: Interpretive Construction under Rational Principles

In the research context of otome games, Zhang Jiang proposed that social interpretations, after going through a process of "washing and filtering", will eventually produce rational and clear public interpretations. This process promotes the hermeneutic cycle to expand from the dialogue between an individual and a text to the communication space among people, others, and society, realizing a transformation from an individual - experience - based cycle to a multi - directionally complex cycle. The interpretive space of otome games also needs to construct a rational public interpretive space through "washing and filtering" to avoid arbitrariness in interpretations. Taking Light and Night as an example, the construction of its rational public interpretive space involves multiple key aspects.

Individual interpretation is the foundation for constructing the public interpretive space and is restricted by various factors such as human sociality, the Mitsein of Dasein, collective experience, and national memory. For example, the third - anniversary theme of Light and Night, "Treading on Clouds to Journey to the West, Meeting Through All Ages", draws inspiration from Journey to the West. Players, based on their "pre - understanding" of this cultural tradition, will form expectation horizons such as "patriotic feelings and universal love" when interpreting this theme. This non - conscious and unconscious pre - understanding integrates the cultural, historical, and social norms in the interpreter's cognitive framework, demonstrating the public basis of individual interpretations.

When individual interpretations enter the public space, individuals express their will and opinions and strive for the recognition of others. With the role of public rationality, interpretations can reach a common understanding and finally form a basic consensus. How to extract rational public interpretive discourses from the complex and diverse individual interpretations is the key to constructing a rational public interpretive space.

On the one hand, the game text world has "inner transcendence", which limits the boundaries of game text interpretations. Public interpretations need to abide by the identity of game text interpretations. When fan works deviate excessively from the original work's settings, it will trigger "OOC" (Out Of Character) criticism from players. At the same time, public interpretations should endow the "events" in the game with a "meta - ontological" status, interpret those events that subvert the existing order and restart a new world, experience the events rather than just go through them, and thus construct an imagined practical behavior.

On the other hand, in the construction of the public interpretive space of otome games, following public rationality is crucial. In the aesthetic interpretation of otome games in the form of "fan narrative", some creators, in order to attract attention, make male characters engage in "yaoi" behavior. This violates the original intention of otome games to satisfy female players' romantic love experiences, undermines character settings and emotional logics, disrupts the normal communication based on game texts, and damages the orderliness of the public interpretive space. Game text narratives also cannot deviate from public rationality.

At the same time, public rationality is not static. The public rationality in public interpretations is a dynamic consensus generated in practice. Public interpretations have reflectivity and historicity. Horizontally, they are reflected in the mutual supplementation with individual interpretations, and vertically, they are reflected in continuous revision with historical progress. In the 2022 Qixi Festival limited - edition card plot "Gathering Scent in the Neon Night" of Light and Night, the male character Charlie Su, when facing a hidden camera, not only did not call the police but regarded it as a romantic interest between lovers and even wanted to buy the secretly - filmed video. This seriously violated the understanding of healthy romantic relationships and moral and legal norms. This deviation from public rationality triggered player resistance, and finally,

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the game developers modified the plot, reflecting the regulation of public rationality on game texts and players' supervision of game texts.

Otome games, through diverse online platforms and rich offline activities, narrow the gap between game texts and players' lives, promoting the transformation of public rationality into practical levels. The promotional activities organized by the official side of Light and Night, such as the public - service video with Shanghai Traffic Police on traffic safety, the special linkage for World Book Day, and the special plan to assist rural revitalization, have played a positive role in guiding players to integrate public rationality into their real - life thinking. At the same time, the supplementation and enrichment of fan narratives in the public interpretive space enable un - contextualized norms to be practiced in more situations. Players, based on their understanding of the game and their own values, create fan works and re - create on the basis of following public rationality. This is also an embodiment of "interpretive consciousness", which enriches and develops public rationality in diverse practices.

In conclusion, the construction of the rational public interpretive space of the otome game Light and Night needs to start from individual interpretations, go through a process of refinement and transformation into public interpretations, rely on the interpretive consciousness of interpreters based on following the prescriptiveness of texts and public rationality, and implement public rationality through practice, so as to construct a healthy and orderly public interpretive space.

Conclusion

Otome games are cultural products of the digital - intelligent era, with rich and diverse interpretive spaces. From the individual imagination and immersive interaction of players at the "Dasein" level, to the collision of multiple discourses among players at the "Mitsein" level, and then to the construction of a rational interpretive space at the "public" level, these three parts progress in a step - by - step manner and influence each other. In the future, with technological progress and changes in players' demands, the narratives and interpretations of otome games will continue to be updated. We should continuously pay attention to their development, deeply study how to balance the relationship between the individual and the public, and between the virtual and the real based on public rationality, ensuring that otome games can not only meet players' emotional needs but also promote positive and healthy cultural exchanges and dissemination, so as to enable the interpretive spaces of otome games to develop better.

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Study on the influence of preferential tax policies on the financial performance of small and medium-sized ceramic enterprises in Jingdezhen

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Abstract

In recent years, small and medium-sized enterprises (SMEs) have played a vital role in the rapid development of China's economy, significantly contributing to economic growth, employment, and innovative development. In response to the financial challenges faced by SMEs, the government has implemented a series of preferential tax policies aimed at promoting their development. Jingdezhen, a city renowned for its historical significance in the ceramic industry, prioritizes the growth of small and medium-sized ceramic enterprises. However, the impact of these preferential tax policies on the financial performance of small and medium-sized ceramic enterprises in Jingdezhen remains to be explored. This paper addresses this critical issue by analyzing the influence and mechanisms through which preferential tax policies affect the financially healthy development strategies of Jingdezhen's ceramics sector. Grounded in demand management theory, tax incentive theory, and the optimal tax system, this research employs statistical analysis to examine the implementation of tax preferential policies for SMEs. It finds that tax reductions in Jingdezhen have significantly decreased operating costs for enterprises, fostered innovation in research and development, optimized the business environment, and contributed to stable growth in the scale of market participants.This study identifies several issues in the process of municipal tax reduction and fee reduction in Jingdezhen, including the need for further optimization of tax reduction and fee reduction policies, inadequate implementation by tax authorities, and insufficient understanding of these policies among taxpayers. To address these challenges, this paper proposes enhancements to the overarching design of tax reduction and fee reduction policies, aims to elevate the legal framework governing tax incentives, and advocates for a coherent and continuous policy system. Furthermore, it emphasizes the importance of synchronizing the implementation of tax reduction and fee reduction policies, improving the information management and collection processes, establishing a new collection and management framework, strengthening policy outreach, and optimizing tax service delivery.

Keywords : small and medium-sized enterprises; ceramics; ax incentives; financial performance

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The influence mechanism of preferential tax policies on the financial performance of smes

Preferential tax policies refer to national tax measures, such as exemptions and tax rebates, that are targeted at specific industries, enterprises, or individuals. In the context of small and medium-sized enterprises (SMEs), these policies are widely implemented to foster development and innovation. The mechanisms through which preferential tax policies influence the financial situation of SMEs primarily include both positive and potential negative impacts. The positive effects of these policies can alleviate the financial burden on SMEs, enhance the financing environment, and strengthen their growth potential. Specifically, preferential tax policies can improve the financial performance of enterprises by lowering their overall tax obligations, thereby increasing cash flow and capacity for investment and financing. For instance, a reduction in income tax can lead to significant improvements in short-term financial performance, while a decrease in turnover tax can positively affect long-term financial outcomes. This differential impact indicates that while immediate tax reductions can rapidly enhance cash flow, sustained growth and innovative investments may require long-term tax strategies.The effects of tax reduction policies can vary significantly based on the ownership structure of enterprises. Non-state-owned enterprises (NSMEs) tend to benefit more positively from tax cuts compared to state-owned enterprises. This disparity is influenced by the social status of these enterprises, which impacts their utilization of tax benefits to enhance their financial standing. Consequently, targeted tax policies that address the specific challenges faced by NSMEs may yield particularly advantageous outcomes. Beyond direct economic benefits, tax incentives can also stimulate research and development (R&D) and investment in small and medium-sized enterprises (SMEs). Specifically designed tax incentives for R&D can greatly encourage SMEs to increase their R&D expenditures, which is vital for fostering innovation and maintaining market competitiveness. In summary, preferential tax

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policies can significantly enhance the financial profiles of SMEs by improving profitability, promoting R&D investment, and encouraging a focus on operational growth rather than financialization.

Analysis of the implementation of preferential tax policies and the problems of small and medium-sized ceramic enterprises in Jingdezhen

Preferential tax policy serves as a crucial tool for the government to stimulate enterprise development and promote economic growth through tax relief and refunds. In Jingdezhen, the implementation of preferential tax policies has been extensively applied and advocated for small and medium-sized ceramic enterprises.

Implementation analysis

1. Publicity and implementation of tax policies

The Jingdezhen municipal government, in collaboration with the finance and taxation departments, actively promotes tax preferential policies through various media, including the official website, WeChat public account, television, telephone, and newspapers. This initiative aims to address questions and concerns in real time, thereby fostering an atmosphere of publicity and public engagement. During the National Tax Publicity Month in April 2024, the finance and tax departments of Jingdezhen city enhanced communication with tax enterprises by establishing a tax volunteer service team that provided personalized services for ceramic enterprises. Furthermore, the Municipal Industry and Information Technology Bureau conducted an online questionnaire survey among ceramic enterprises to raise awareness of these policies. The municipal finance and tax departments have also organized multiple enterprise symposiums, implemented 'one-to-one' policy publicity, and offered individualized tax guidance to leading enterprises with significant production scales and aspirations to go public.

2. Tax services and enterprise development

Preferential tax policies can enhance the profitability of enterprises and improve their financing capabilities and confidence by alleviating the burden of corporate income tax and value-added tax. The tax department offers comprehensive tax services to enterprises, assisting them in understanding and accessing various preferential tax policies in a timely manner. Additionally, it provides cross-border tax guidance for the Jingdezhen ceramic industry, thereby supporting cross-border ceramic enterprises. Small and medium-sized ceramic enterprises in Jingdezhen face numerous challenges in financing, including low credit ratings, high risks, and elevated financing costs. By leveraging preferential tax policies, these SMEs can lower their financing costs, bolster their financing capacity and confidence, and attract increased investment and capital.

3. Cost management and accounting information problems

Many ceramic enterprises exhibit a weak awareness of cost management, resulting in incomplete cost accounting data, an inadequate cost management system, and unreliable accounting information. Typically, small and medium-sized enterprises do not employ professional accountants, leading to low levels of financial processing. According to the announcement from the Ministry of Finance and the administration of taxation, small-scale taxpayers are subject to a VAT rate of 3% on taxable sales revenue, with a deduction of 1% VAT (effective until December 31, 2027). Additionally, they benefit from a 50% tax reduction on other additional taxes, local taxes, and fees, which diminishes the incentive for small-scale taxpayers to register as general taxpayers and enjoy the advantages of a simplified tax regime.

Analysis of the implementation problems of small and medium-sized ceramic enterprises in Jingdezhen

1.Reduce government fiscal revenue

The implementation of preferential tax policies can alleviate the tax burden on small and medium-sized enterprises, thereby reducing government fiscal revenue. Government fiscal revenue is a crucial source for ensuring the functioning of the government and funding social welfare expenditures. Consequently, the implementation of preferential tax policies must carefully consider both the advantages and disadvantages to ensure that the government's fiscal operations are not excessively impacted. If these policies result in a significant decline in fiscal revenue, the government may need to address the resulting fiscal gap through alternative measures, such as reducing social welfare spending or increasing fiscal outlays.

2.Market bargaining power is not strong

Many small and medium-sized ceramic enterprises possess limited bargaining power, which allows upstream and downstream firms with stronger bargaining positions to easily appropriate the benefits generated by tax reductions. This dynamic results in diminished motivation and reduced autonomy for these enterprises when it comes to opting for straightforward collection methods.

3.Weak awareness of cost management ability

Many ceramic enterprises exhibit a weak awareness of cost management, resulting in incomplete cost accounting data and an unsound cost management system. Consequently, the reliability of accounting information is compromised. Small and medium-sized enterprises, in particular, often do not employ professional accountants, leading to a low level of financial processing.

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Suggestions for promoting the development of smalland medium-sized ceramic enterprises in Jingdezhenunder the preferential tax policies

Tax preferential policies significantly influence the financial circumstances of small and medium-sized enterprises (SMEs). To ensure their sustainable development, SMEs should formulate appropriate strategies aimed at promoting financial health.

Strengthen the policy publicity and guidance, and improve the tax management ability

A variety of publicity methods, including the official website, WeChat public account, television, telephone, and newspapers, are employed to vigorously promote tax preferential policies. This ensures that enterprises can promptly understand and benefit from various preferential policies. Precise guidance is provided to enterprises in collaboration with the government to enhance investment attraction efforts, particularly in promoting and implementing policies related to foreign investment in ceramic enterprises. Additionally, management practices are standardized to maximize the effectiveness of a comprehensive information exchange platform. This platform facilitates information comparison, enables a better understanding of the actual production situation of industry taxpayers, and addresses gaps in tax collection and management.

Docking incentive policies and innovate tax service methods

We vigorously cultivate leading ceramic enterprises by supporting the establishment of funding initiatives aimed at rewarding and nurturing their growth. Concurrently, we actively assist small and medium-sized ceramic enterprises by formulating preferential policies that combine support for individual enterprises with regulations for small enterprises. This approach aims to create a hierarchical cultivation system encompassing individual industrial and commercial households, small and micro enterprises, as well as larger enterprises. We provide 'all-weather and seamless' services, facilitating online processing of tax-related matters, enabling self-management of routine issues, expediting the handling of tax-related transactions, and simplifying the process for tax incentives. These efforts are designed to enhance taxpayers' experience with convenient tax handling, ultimately achieving the objectives of cost reduction, an improved environment, and strengthened internal operations.

Characteristic development strategy, diversification strategy

Building upon the existing Jingdezhen Ceramic Industrial Park, this initiative aims to integrate ceramic industry resources, emphasize professionalism, and establish a nationally recognized ceramic industry park. The strategy includes the targeted introduction of high-end domestic and foreign ceramic enterprises through sole proprietorship or partnerships, as well as the promotion of various forms of ceramic industry technology alliances. Leveraging the brand appeal of 'Jingdezhen,' the plan seeks to create a Jingdezhen brand listed company through mergers and acquisitions. Concurrently, it will support local enterprises, particularly the Jingdezhen Ceramic Corporation, in consolidating their efforts to foster the development of the Jingdezhen Ceramic Enterprise Alliance. This approach aims to continually enhance the brand value and influence of Jingdezhen ceramics, shifting the business paradigm from 'selling products' to 'selling brand,' 'selling concepts,' and 'selling culture.' By positioning the brand at the forefront of marketing, the initiative aspires to attract a larger consumer base through the allure of the Jingdezhen brand.

Strengthen risk management and fund management

To mitigate financial risks and ensure the financial security of enterprises, it is imperative to strengthen both risk management and fund management practices. Enterprises should establish a comprehensive risk management system alongside an effective fund management system, implementing scientific and efficient measures in both areas. In terms of risk management, it is essential to proactively predict and respond to market risks, credit risks, and other potential threats. Various risk management tools, such as insurance and futures contracts, should be utilized to mitigate risks and minimize losses. Furthermore, a robust internal control mechanism must be established, which includes enhancing internal audit processes and supervision to improve the enterprise's ability to identify and respond to risks. Regarding fund management, a scientific fund management system should be instituted to facilitate the rational allocation and effective utilization of financial resources. This can be achieved through the establishment of a capital budget, which will strengthen capital supervision and control, thereby enhancing the enterprise's capital management capabilities. Additionally, fostering cooperation and communication with financial institutions is crucial for securing increased financing support and improving the overall financing capacity of enterprises. Moreover, small and medium-sized enterprises (SMEs) should also focus on enhancing their internal management and organizational coordination to bolster financial transparency and integrity. Establishing a sound financial system and internal control framework is vital, alongside conducting timely financial analyses and evaluations to identify potential financial risks, enabling the implementation of prompt measures to avert such risks.

Strengthening the construction of talents

To strengthen the construction of talent team is a necessary condition to realize the sustainable development of enterprises. Small and medium-sized enterprises should pay attention to talent training and introduction, and improve their management level and innovation ability. First of all, we should pay attention to the training and introduction of professional talents, establish a perfect talent training system, strengthen internal training and external learning, and improve the professional quality and skill level of employees. At the same time, through the recruitment and introduction of excellent talents, to make

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up for the short board of enterprise talents, improve the technical level and innovation ability of enterprises. Secondly, to strengthen the incentive and retention of talents. Enterprises should establish a perfect talent incentive mechanism, such as salary incentive, career promotion, employee welfare, etc., to encourage employees to work actively and make contributions to the enterprises. At the same time, enterprises should also develop personalized retention plan and plans according to the actual situation of talents, so as to provide a good working environment and development opportunities for excellent talents, retain talents, and provide a strong guarantee for the development of enterprises.

Closing remark

To mitigate financial risks and ensure the financial security of enterprises, it is essential to strengthen risk management and fund management practices. Enterprises should establish robust risk management and fund management systems, implementing scientific and effective measures to address these concerns. Preferential tax policies are crucial for promoting the development of small and medium-sized enterprises (SMEs) and fostering economic growth. By alleviating the financial burden on enterprises, enhancing the financing environment, and encouraging cooperation among businesses, these policies can significantly improve the competitiveness, development capacity, profitability, and market share of SMEs. Concurrently, SMEs must enhance their financial management capabilities, technological innovation, risk management practices, and talent development to fully leverage the benefits of preferential tax policies and achieve sustainable growth. Furthermore, the government should design scientific and effective tax policies tailored to the actual circumstances, ensuring the rational allocation of resources while maintaining the fairness, rationality, and sustainability of the tax framework.

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Multidisciplinary Perspectives on Eating Disorders: From Socio - psychological Roots to Cutting - edge Treatments and Future Prospects

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Abstract

This study takes a multidisciplinary approach, drawing from sociology, psychology, and psychiatry to explore binge eating disorder (BED) and related eating disorders, such as anorexia nervosa and bulimia nervosa. It highlights how the sociocultural ideal of thinness increases body image dissatisfaction, particularly in lower socioeconomic groups, leading to maladaptive eating behaviors like binge-eating episodes and purging. The study also examines the psychodynamic factors of BED, including neuroendocrine dysregulation, body image distortions, and compulsive dieting, which may serve as coping strategies for socioeconomic stress. Therapeutic approaches such as Cognitive Behavioral Therapy (CBT), Integrative Cognitive-Affective Therapy (ICAT), and Dialectical Behavior Therapy (DBT) are reviewed, alongside pharmacological treatments and emerging neuromodulatory techniques like Transcranial Magnetic Stimulation (TMS). Despite these advances, the underlying mechanisms of BED remain unclear, necessitating further research in novel treatments and precision medicine. The paper emphasizes the potential of AI-driven algorithms and multimodal data fusion in improving diagnostics and individualized treatments, while stressing the importance of ethical frameworks for data security. These innovations promise significant advancements in managing eating disorders.

Keywords : Eating Disorders, Bulimia Nervosa, Sociocultural Construction, Psychodynamic Mechanisms, Digital Health Interventions, Multi-Omics Integration

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Introduction

The term "binge" was originally employed to describe excessive alcohol consumption but has since been broadly appropriated to denote episodes of excessive food intake within a limited time frame. For some individuals, occasional binge eating may constitute a transient indulgence without lasting adverse consequences. However, in others, it progresses into a compulsive and uncontrollable behavior, frequently accompanied by a profound sense of loss of control. Binge eating is characterized by two defining features: the consumption of an abnormally large quantity of food within a discrete temporal window and a pronounced inability to regulate eating behavior during such episodes.

For most people, eating is associated with pleasure and enjoyment. However, for those with binge eating issues, Under normal circumstances, food consumption is inherently associated with pleasure and gratification. However, for individuals exhibiting binge eating tendencies, eating ceases to be a source of enjoyment and instead becomes a significant psychological burden, often perceived as an external force exerting control over their behavior. This pathological eating pattern is frequently accompanied by diminished self-esteem, feelings of shame, guilt, and despair, perpetuating a self-reinforcing cycle of emotional distress. Individuals with binge eating pathology typically oscillate between restrictive dieting and episodes of binge eating: stringent dietary restrictions often precipitate binge episodes, and the subsequent guilt fosters renewed dietary restraint, thereby perpetuating the maladaptive cycle. This dysfunctional pattern not only poses substantial risks to physical health but also disrupts various domains of life, including daily functioning, occupational performance, and academic engagement, ultimately leading to a marked reduction in overall quality of life. Relative to the general population, individuals diagnosed with binge eating disorder (BED) exhibit heightened psychological distress and encounter significant challenges in social adaptation.

Binge eating is commonly observed among individuals with eating disorders, such as anorexia nervosa, bulimia nervosa, and binge eating disorder. When binge eating is recognized as problematic, it is categorized as an "eating issue"; however, when it significantly impairs an individual's health or quality of life, it is diagnosed as an "eating disorder." Eating disorders encompass conditions like anorexia nervosa, bulimia nervosa, binge eating disorder, and atypical eating disorders. Although both bulimia nervosa and binge eating disorder involve binge eating episodes, the key difference is that individuals with binge eating disorder do not engage in extreme compensatory behaviors to control weight. The presence of compensatory behaviors in bulimia nervosa, such as purging or excessive exercise, precludes the diagnosis of binge eating disorder.

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Recent research on eating disorders increasingly focuses on sociocultural factors, particularly the relationships between body image, socioeconomic status, and identity construction. The societal idealization of thinness profoundly shapes perceptions of the ideal body type and exacerbates anxiety regarding body management, especially among lower socioeconomic groups. The cultural ideal of slimness often leads individuals to excessively preoccupy themselves with their bodies in pursuit of this ideal, impacting their physical and mental well-being. This paper aims to explore eating disorders, particularly bulimia nervosa, from a multidisciplinary perspective encompassing sociology, psychology, and psychopathology. It examines how these disorders serve as coping mechanisms for individuals facing socioeconomic anxiety and how they manifest unique psychological dynamics within social mobility, uncovering the deep connections between eating disorders and socioeconomic factors.

The Socio-Cultural Construction of Eating Disorders

The Idealization of Thinness and Bodily Capital

In contemporary society, the idealization of thinness is widely promulgated, often associated with low body fat, toned muscles, and other physical traits. This aesthetic standard is frequently linked with self-discipline, success, and high social capital, becoming a significant symbol within the social and cultural milieu. The media, consumer culture, and social networks play crucial roles in reinforcing this standard, leading individuals to perceive body management as an integral part of their identity construction. The female body is not only a site of social discipline but also a focal point of cultural power dynamics, where bodily image becomes a key form of social capital. In this context, body image evolves into a vital asset in social competition, influencing daily life, social interactions, and the construction of self-identity.

Eating Disorders and Socioeconomic Status

Extensive research indicates that the prevalence of eating disorders varies significantly across different socioeconomic groups. Individuals from higher socioeconomic backgrounds are more likely to develop anorexia nervosa (AN), whereas those from lower socioeconomic strata tend to exhibit higher rates of bulimia nervosa (BN) and binge eating disorder (BED) (Gordon, 2000). This disparity may be attributed to differences in access to the thin ideal across social classes. Within higher socioeconomic groups, resources such as health foods, fitness facilities, and cosmetic medical interventions are readily available, normalizing body management practices. In contrast, individuals in lower socioeconomic groups, facing resource limitations, often resort to extreme dieting, binge-purge cycles, and other maladaptive behaviors to achieve the socially sanctioned body image and gain societal approval.

Dietary Control as a Symbol of Social Mobility

For individuals on the socioeconomic margins, body management transcends mere aesthetic concerns and takes on symbolic significance as a marker of social mobility. LeBesco (2004) argues that thinness is constructed as a form of controllable capital, while obesity is stigmatized as indicative of poverty, lack of self-discipline, and social failure. For patients with eating disorders, particularly those with bulimia nervosa, the ability to "endure hunger" is often viewed as a strategy for self-enhancement, with the belief that through dietary control, they can transcend the limitations imposed by their social class, thereby achieving upward social mobility and gaining societal recognition. This cognitive framework plays a pivotal role in the individual's process of self-identity formation and behavioral regulation, acting as a strategy in their interaction with the broader social environment.

Psychological Dynamics of Bulimia Nervosa

Neuroendocrine Mechanisms of the Dieting-Bingeing Cycle

From a neuroendocrine perspective, dieting behaviors precipitate binge eating through multiple interconnected pathways. Chronic caloric restriction leads to dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis, resulting in elevated cortisol levels that heighten the body’s sensitivity to stress, which in turn increases the likelihood of binge eating episodes. Moreover, food restriction activates the dopaminergic reward system, with hyporesponsive dopaminergic neurons becoming hypersensitive, thus significantly amplifying the pleasure derived from binge eating. This neurobiological alteration reinforces the behavior of binge eating. In addition, disruptions in the serotonin system, particularly through dysfunction in the 5-HT2A receptor, impair the signaling of satiety, further contributing to the propensity for binge eating. These neuroadaptive changes create a positive feedback loop of dieting leading to bingeing, highlighting the neurobiological basis of binge eating and its contribution to impulsive eating behaviors.

Body Anxiety and Identity Crisis

The psychological foundation of bulimia nervosa lies in an overwhelming preoccupation with body weight, shape, and self-worth. For many individuals, self-esteem is intricately tied to body image, which is continuously assessed through social comparison. Within the framework of social comparison theory, individuals measure their worth by contrasting their appearance, behaviors, and social standing with those of others. This process can exacerbate feelings of bodily inadequacy, particularly among individuals from lower socioeconomic backgrounds, engendering a "bodily inferiority complex" that motivates extreme eating behaviors. These behaviors, in turn, are often driven by the desire to gain social acceptance and external validation of self-worth.

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Dietary Control and Compulsive Behaviors

Individuals with bulimia nervosa often oscillate between restrictive dieting and binge-purge cycles, a pattern closely linked to compulsive behaviors. Neurobiological abnormalities in regions of the brain associated with eating behaviors are frequently observed in bulimia nervosa patients. These irregularities result in temporary pleasure during binge episodes, followed by guilt and shame after compensatory purging. The alternating emotional states reinforce these behaviors, transforming the binge-purge cycle into a form of self-regulation. However, this pattern ultimately exacerbates emotional distress and physical health issues, perpetuating a continuous cycle of disordered eating and emotional turmoil.

The Societal Symbolism of Eating Behavior

Eating behaviors extend beyond basic physiological needs, carrying profound social and symbolic significance. From a socioeconomic perspective, food consumption patterns are often intricately tied to social identity. A lean physique is frequently associated with higher social status, while obesity is stigmatized as indicative of lower social status. This societal construction of ideal body images has significant implications for individuals with bulimia nervosa. Many patients experience intense identity threats when they fail to conform to societal body ideals. This threat heightens their sense of loss of control over eating behaviors and compensatory actions, further entrenching them in cycles of self-denial and disordered behavior.

Intervention Methods

Psychological Treatment: Core Intervention Approach

Psychological treatment plays a pivotal role in the management of binge eating disorder (BED), primarily focusing on identifying and modifying the psychological factors that contribute to binge eating behaviors, while equipping patients with effective coping strategies. Several therapeutic methods have been widely implemented and have demonstrated significant efficacy in clinical settings:

(1) Cognitive Behavioral Therapy (CBT): Cognitive Behavioral Therapy is widely regarded as the first-line intervention for BED, grounded in the cross-diagnostic model of eating disorders. This model suggests that disorders such as anorexia nervosa, bulimia nervosa, and BED share key symptomatic similarities, and as these conditions evolve, patients may experience shifts in their symptomatology— for instance, a transition from anorexia nervosa to bulimia nervosa. Therefore, treatment strategies should address common underlying factors across eating disorders, rather than focusing solely on specific diagnostic categories.The core mechanism of CBT involves the modification of cognitive patterns and behavioral habits, helping patients identify and address triggers for binge eating, such as negative emotions, stressors, and issues related to self-esteem. Additionally, CBT targets distorted cognitions about food, body image, and weight, which often underlie maladaptive behaviors such as restrictive dieting, excessive exercise, binge eating, and purging. Through cognitive restructuring and emotional regulation training, CBT helps patients develop healthier responses to these triggers, reducing binge episodes and improving self-esteem and psychological well-being. Professor Fairburn emphasizes that treatment should begin by identifying the maintenance patterns of the eating disorder. By utilizing behavioral techniques to address disordered eating and correcting distorted beliefs, patients can reduce the psychological distress associated with the disorder and gradually restore healthy eating behaviors and self-identity.

(2) Integrative Cognitive-Affective Therapy (ICAT): Integrative Cognitive-Affective Therapy (ICAT) places particular emphasis on the interplay between cognition and emotion, recognizing emotional dysregulation as a central driver of binge eating behaviors. This therapeutic approach contends that emotional distress and instability play a primary role in the onset of binge eating. As such, treatment focuses on helping patients better understand and regulate their emotional responses. Through cognitive restructuring, emotion regulation training, and self-acceptance exercises, ICAT aims to mitigate binge eating behaviors triggered by emotional dysregulation, fostering emotional equilibrium and promoting healthier eating patterns.

(3) Dialectical Behavior Therapy (DBT): Dialectical Behavior Therapy (DBT) is especially effective for patients with significant emotional instability and impaired impulse control. Its therapeutic goals are centered on enhancing emotional regulation, improving stress coping mechanisms, and promoting adaptive behavioral patterns. Research supports the efficacy of DBT in significantly reducing the frequency of binge eating episodes, while simultaneously improving psychological resilience. Through these objectives, DBT helps patients manage emotional states more effectively, reducing the recurrence of binge eating and enhancing overall psychological well-being.

Pharmacotherapy: Adjunctive Interventions

Pharmacotherapy assumes a pivotal role in the management of binge eating disorder (BED), with pharmacological agents such as Lisdexamfetamine being of particular relevance. The therapeutic mechanisms by which pharmacological interventions address BED primarily encompass the modulation of neurobiological processes and metabolic functions.

Modulation of Neurotransmitter Systems

Dopaminergic Regulation: The etiology of BED is intricately linked with the dysregulation of multiple neurotransmitter systems, with dopamine being a central component within the brain's reward circuitry. Dopamine is instrumental in mediating the hedonic experience associated with rewarding stimuli, such as food intake. Under normal physiological conditions, food consumption activates the brain's reward pathways, culminating in dopamine release, which induces sensations of pleasure and satisfaction. However, in individuals with BED, the reward system exhibits heightened sensitivity to food stimuli, resulting in

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an inability to suppress food cravings and thereby precipitating binge eating behaviors. Lisdexamfetamine augments dopamine release and inhibits its reuptake, thereby elevating dopamine concentrations within the synaptic cleft. This pharmacological action mitigates hyperactivity within the reward system, consequently diminishing food cravings and impulsivity, leading to a reduction in the frequency of binge eating episodes.

Serotonergic Impact: Serotonin is paramount in mood regulation, and BED patients frequently present with emotional dysregulation, wherein serotonin imbalance is a critical factor. Lisdexamfetamine may exert an influence on serotonin transmission, thereby ameliorating mood, alleviating anxiety and depression, and curtailing binge eating behaviors induced by emotional distress. Given that emotional fluctuations are often precipitants of binge eating episodes in BED patients, mood stabilization is essential for mitigating such episodes.

Impact on Metabolism and Energy Homeostasis

Metabolic Modulation: Lisdexamfetamine also exerts effects on metabolic processes and energy balance, which are frequently perturbed in BED patients with comorbid obesity. The pharmacological agent may enhance basal metabolic rate, thereby increasing energy expenditure at rest and promoting lipolysis. This facilitates weight reduction in BED patients, thereby improving overall health, reducing the risk of obesity-related comorbidities, and alleviating psychological stress associated with weight concerns. By concurrently addressing metabolic dysregulation and neurotransmitter imbalances, Lisdexamfetamine offers a holistic therapeutic approach, thereby enhancing the overall efficacy of BED treatment.

Pharmacotherapeutic Diversity

Beyond Lisdexamfetamine, the pharmacological management of BED encompasses a variety of other medications:

(1) Second-Generation Antidepressants: Second-generation antidepressants, such as fluoxetine, hold significant utility in BED management. These agents modulate neurotransmitter levels in the brain, particularly serotonin (5-HT), thereby stabilizing mood and attenuating binge eating impulses. Clinical trials predominantly demonstrate that patients administered second-generation antidepressants experience a marked reduction in binge eating frequency and symptom severity relative to placebo groups. Nonetheless, individual variability in response to these medications necessitates tailored treatment plans based on specific patient responses and clinical considerations.

(2) Antiepileptic Drugs: Antiepileptic drugs, such as topiramate, are also employed in the treatment of BED. These agents primarily function by modulating neuronal excitability, thereby inhibiting excessive neural activity and reducing binge eating behaviors. Empirical evidence indicates that topiramate significantly curtails the frequency of binge eating episodes, thereby enhancing dietary control in patients. However, antiepileptic drugs may be associated with adverse effects, including cognitive impairment and sensory disturbances, necessitating a judicious assessment of risks and benefits, particularly when psychological interventions prove insufficient. In such scenarios, pharmacological interventions serve as valuable adjuncts, modulating neurotransmitter levels and mitigating impulsive eating behaviors.

(3) Lisdexamfetamine (Vyvanse): Lisdexamfetamine (Vyvanse) is an FDA-approved pharmacological agent for the treatment of moderate to severe BED in adults. The primary mechanism involves the modulation of norepinephrine and dopamine systems within the brain, thereby reducing food-related impulses and the frequency of binge eating episodes. Although Vyvanse has demonstrated efficacy in clinical settings, it possesses a potential for addiction and may induce side effects such as insomnia, anxiety, and tachycardia. Therefore, its administration necessitates meticulous monitoring and supervision by healthcare professionals to ensure patient safety and optimize therapeutic outcomes.

(4) Selective Serotonin Reuptake Inhibitors (SSRIs): Selective serotonin reuptake inhibitors (SSRIs), such as fluoxetine, are commonly utilized in the treatment of BED, particularly when accompanied by mood disorders. By enhancing serotonin concentrations within the synaptic cleft, SSRIs stabilize mood and diminish impulsive eating behaviors. Research substantiates that SSRIs significantly reduce the frequency of binge eating episodes and alleviate concomitant depressive and anxiety symptoms. SSRIs not only facilitate emotional stability but also mitigate binge eating behaviors precipitated by emotional fluctuations, thereby contributing positively to the comprehensive management of BED.

In conclusion, for certain patients, psychological therapy may be insufficient to fully ameliorate BED symptoms. In such instances, pharmacotherapy serves as an adjunctive intervention, effectively modulating neurotransmitter levels and reducing impulsive eating behaviors. The integration of pharmacotherapy with psychological therapy enhances overall treatment efficacy, providing a more comprehensive approach to managing BED.

Physical Therapy: Emerging Interventions

In recent years, non-invasive neuroregulation techniques (NIBS) have emerged as a promising and innovative therapeutic approach for the treatment of binge eating disorder (BED), demonstrating significant potential. These methods aim to modulate neural activity within specific brain regions, targeting the pathophysiological mechanisms underlying BED, and subsequently improving maladaptive eating behaviors and emotional dysregulation. Among these techniques, Transcranial Magnetic Stimulation (TMS) and Transcranial Ultrasound Stimulation (TUS) have garnered particular attention as key non-invasive neuroregulation strategies with substantial therapeutic efficacy in BED management.

TMS operates by utilizing magnetic fields to induce electrical currents in specific brain regions, such as the dorsolateral prefrontal cortex (DLPFC), modulating neuronal excitability. Accumulating evidence from clinical studies suggests that TMS is effective in reducing binge eating behaviors, especially in individuals who exhibit inadequate responses to conventional therapeutic modalities, including pharmacotherapy and psychotherapy. By targeting brain regions implicated in the regulation

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of emotions, cognitive control, and decision-making processes, TMS has the potential to attenuate impulsivity, enhance self-regulation, and thereby provide a promising intervention for individuals with treatment-resistant BED.

Transcranial Ultrasound Stimulation (TUS) utilizes focused ultrasound waves to precisely target and stimulate deeper brain structures. Preliminary studies suggest that TUS can modulate brain activity associated with hunger regulation and emotional processing. Despite its current status as an experimental modality, TUS holds significant promise as a non-invasive intervention for BED, offering the potential to complement existing treatment approaches. As ongoing research further elucidates its mechanisms, TUS may emerge as a viable, novel, and non-invasive therapeutic option for symptom management in BED.

In addition to TMS and TUS, other NIBS techniques, such as repetitive Transcranial Magnetic Stimulation (rTMS), Transcranial Direct Current Stimulation (tDCS), and neurofeedback, are also being explored for their potential to modulate brain activity and influence behavioral and emotional states. Preliminary evidence supports the hypothesis that these techniques may improve impulse control and emotional regulation in individuals with BED, ultimately reducing the frequency and severity of binge eating episodes. However, the current body of literature remains limited, characterized by small sample sizes and methodological variability. Thus, further rigorous investigation is required to determine the efficacy, safety, and optimal application protocols for these interventions.

In conclusion, NIBS techniques represent a promising, non-invasive therapeutic pathway for the treatment of BED, particularly for patients who exhibit insufficient response to traditional pharmacological and psychological interventions. Future research efforts should focus on elucidating the underlying neurobiological mechanisms of these modalities, optimizing treatment parameters, and conducting large-scale, well-controlled clinical trials to substantiate their clinical efficacy and safety. Furthermore, exploring the integration of NIBS with other therapeutic strategies, such as cognitive behavioral therapy (CBT), may enhance treatment outcomes and improve long-term recovery prospects for individuals suffering from BED.

Conflict of Interest

While current therapeutic interventions have yielded considerable improvements for many individuals, the fundamental pathophysiological mechanisms underlying binge eating disorder (BED) remain inadequately elucidated. Therefore, future research is poised to address several pivotal areas that are expected to enhance our understanding and treatment of BED:

Development of Novel Pharmacological Agents

Current pharmacological treatments are constrained by notable limitations, including significant adverse effects and inconsistent long-term efficacy. As a result, research efforts are increasingly focused on the identification and development of more targeted, efficacious, and safer pharmacological agents. In particular, there is growing interest in novel compounds aimed at modulating the serotonin-dopamine system, which could provide more sustainable therapeutic outcomes while mitigating the risk of dependence associated with existing treatments.

GLP-1 receptor agonists, initially developed for the management of type 2 diabetes, represent a promising class of drugs that regulate appetite by mimicking the physiological actions of GLP-1, a gut-derived incretin hormone that inhibits gastric emptying, enhances satiety, and reduces food intake. Clinical trials have shown that agents such as liraglutide and dulaglutide may significantly reduce binge eating episodes and contribute to weight loss in obese patients, particularly those with comorbid binge eating disorder and diabetes. Despite their potential, these medications are still under investigation, and additional large-scale clinical trials are needed to substantiate their long-term efficacy, safety, and applicability across diverse patient populations.

Digital Health Interventions

The rapid evolution of digital health technologies has led to the integration of advanced interventions such as Digital Cognitive Behavioral Therapy (CBT), Artificial Intelligence (AI)-assisted psychotherapy, and mobile health applications (mHealth) into the management of eating disorders. Wearable devices, such as smart bands, can now continuously monitor key metrics including eating behaviors, emotional fluctuations, and stress levels. The integration of these data with AI-powered algorithms allows for the development of highly personalized and real-time intervention strategies, significantly enhancing the convenience, accessibility, and individualized nature of therapeutic options.

Francesco Monaco and Annarita Vignapiano have highlighted the role of digital health and precision medicine in the treatment of eating disorders, particularly through the Master Data Platform (MDP). This platform leverages AI, machine learning, and real-time data analytics to process multi-source patient data, facilitating the optimization of treatment protocols and fostering greater patient engagement. While the potential of such platforms is substantial, challenges related to the integration of emerging technologies, data privacy concerns, and ethical considerations must be addressed to fully harness the transformative power of digital health and precision medicine in eating disorder management.

Multi-Omics Integration

Genomics plays a pivotal role in advancing our understanding of binge eating disorder (BED), particularly by elucidating the genetic underpinnings, as well as the shared genetic basis of metabolic and psychiatric symptoms. Research has consistently demonstrated a strong association between genetic factors and BED, with specific loci linked to key metabolic processes, neurotransmitter systems, and behavioral regulation. Genomic research not only facilitates the identification of

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genetic risk factors for BED but also lays the groundwork for the application of precision medicine, enabling the tailoring of treatment strategies and pharmacological interventions based on individual genetic profiles.

Looking ahead, future research is expected to place increasing emphasis on the integration of multi-omics data, including genomics, transcriptomics, metabolomics, and neuroimaging, to uncover the complex molecular and neurobiological mechanisms underlying BED. This integrative approach promises to facilitate the development of highly personalized treatment plans that are individualized based on a comprehensive understanding of each patient's unique molecular and physiological characteristics. The integration of multi-omics with precision medicine holds the potential to significantly enhance treatment efficacy and optimize the overall management of BED.

Conclusion

Future research and therapeutic approaches for eating disorders (EDs), particularly binge eating disorder (BED), are expected to increasingly embrace precision, personalization, and interdisciplinary integration. The advancement of novel pharmacological agents, the incorporation of digital health technologies, the integration of multi-omics data, and the exploration of non-invasive neuroregulation techniques are anticipated to result in substantial improvements in treatment outcomes and significant enhancements in patients' overall quality of life. Furthermore, the enduring influence of socio-cultural factors on the emergence and progression of EDs must remain a focal point of inquiry. Future research should aim to elucidate the complex interplay between these factors and EDs, thereby facilitating the development of more effective, contextually tailored prevention and intervention strategies.

Binge eating disorder, as a multifaceted psychological condition, necessitates an integrative treatment paradigm that combines psychological, pharmacological, and physiological interventions. Although Cognitive Behavioral Therapy (CBT) remains the foundational therapeutic modality, the emergence of innovative neuroregulation techniques and digital health interventions presents novel treatment avenues. As research continues to evolve, precision medicine and individualized treatment models will play an increasingly central role in optimizing therapeutic outcomes and enhancing the overall well-being of affected individuals.

The future trajectory of ED research will be characterized by the integration of diverse multimodal data, encompassing genomics, transcriptomics, epigenomics, and environmental factors, with the goal of achieving more precise disease subtyping and enabling more targeted, personalized interventions. Artificial Intelligence (AI) and Deep Learning (DL) methodologies will be pivotal in processing and analyzing heterogeneous data sets. Advanced techniques, such as 3D Convolutional Neural Networks (3D-CNN) for brain imaging analysis, Variational Autoencoders (VAE) for identifying patient subtypes, and Transformer models for uncovering the temporal relationships between eating behaviors and emotional fluctuations, will be central to these endeavors. Additionally, the integration of real-time dynamic intervention systems, supported by edge computing and intelligent decision-making frameworks, will allow for millisecond-level responses, thereby optimizing individualized treatment pathways and enhancing the precision of clinical interventions.

To safeguard data integrity and protect patient confidentiality, the establishment of rigorous ethical frameworks will be paramount. This includes the implementation of differential privacy protocols and blockchain-based audit systems for secure and transparent data handling. The clinical translation of these technological advancements will encompass the development of intelligent diagnostic platforms, personalized digital therapeutics, and augmented reality (AR)-assisted treatment modalities. Collectively, these innovations will drive the advancement of precision diagnostics and the implementation of comprehensive, individualized interventions in the management of eating disorders.

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Understanding Chinese University Students' Preferences for Nature-based Recreation in Urban Parks

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Abstract

This study aim to measure the preference for nature-based recreation activities in parks among Chinese university students and identify key factors that influencing their choices. This research employ a quantitative approach, utilizing a structured questionnaire to collect data from 410 students, predominantly female, aged 21-23, and seniors. Multiple linear regression analysis was conducted to quantify the impact of environmental, individual and social demographic factors on students' preferences. The findings reveal that students prioritize activities such as walking, sunbathing, and socializing, with factors like family income, gender, companionship, and park accessibility significantly influencing their preferences. Environmental knowledge and landscape elements further enhance preferences for photography, meditation, and outdoor sports. Notably, the COVID-19 pandemic negatively impacted certain activities, underscoring its influence on outdoor recreation. These insights highlight the importance of park accessibility, aesthetic design, and environmental education in shaping students' recreational choices. The study provides practical recommendations for urban park design, such as improving landscape elements and creating inclusive spaces that cater to the diverse needs of university students. By addressing these factors, urban parks can better serve as vital spaces for relaxation, socialization, and well-being, contributing to sustainable urban development.

Keywords : Nature-based recreation;Urban Parks; Preference; Chinese university students; Multiple linear regression

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Introduction

Nature-based tourism has garnered significant attention in recent decades, emerging as a critical component of the global tourism industry (Räikkönen et al., 2023). The economic value of nature-based activities continues to rise(Haukeland et al., 2023), with the global ecotourism market valued at USD 181 billion in 2019 and estimated to cross USD 333.8 billion by 2027(Statista, 2023). This growth is further underscored by a 2021 Deloitte survey, which revealed that 81% of respondents across 19 countries participated in outdoor activities, while 55% purchased outdoor equipment within the past year(ISPO, 2021).

Beyond its economic impact, nature-based recreation plays a vital role in fostering social resilience, sustainability, and environmental awareness (Winter et al., 2019). For instance, outdoor education through nature-based activity could help counteract a societal disconnection form nature (Matti, 2013), while experiences in national park enhance environmental awareness and emotional connections(Shannon, 2012). Additionally, natural environments facilitate social interactions and symbolic landscapes that contribute to the the healing process for participants in recreational tourism activities (Wen, 2024).

Among the diverse participants in nature-based tourism, university students stand out as a unique influential demographic. Research has consistently shown that engagement in nature-based recreation activities can significantly benefit students' mental health (Rosa et al., 2023). However, despite the growing popularity of nature-base tourism, there remains a notable gap in understanding the specific factors that influence students' choosing a nature-based preferences for these activities(Tod, 2015). Existing studies often rely on qualitative methods or small-scale surveys, which may lack the statistical rigor to draw robust conclusions. Additionally, many studies fail to comprehensively examine the interplay of individual characteristics, environmental attributes, and social influences that shape these preferences.

This study aims to address these gaps by measuring the preference for nature-based recreation activities among university students in China and identifying the key factors influencing their choices. Employing a mixed-methods approach, combining quantitative surveys with qualitative insights, the research aims to provide a nuanced understanding of how students engage with urban green spaces. By doing so, this study not only contribute to the academic discourse on nature-based tourism, but also offers practical insights for park management and urban space design. These findings align with China's ongoing efforts to build greener, more livable cities, ensuring that urban parks meet the evolving needs of younger generations while promoting sustainable development.

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Literature Review

Nature-based Recreation Activities in Urban Parks

Nature-based recreation encompasses physical and intellectual interactions with biota, ecosystems and landscapes, offering individuals opportunities to connect with and experience natural environments (Vallecillo et al., 2019; Sumanapala & Wolf, 2020). These activities, which include hiking, trekking, cycling, picnicking, and nature observation, are not only recreational but also serve as platforms for educating visitors about biodiversity and environmental issues (Hughes, 2012; Immoos & Hunziker, 2015) Urban parks, as key components of green infrastructure, provide essential settings for nature-based recreation in cities, offering accessible space where individuals can engage with nature (Cortinovis et al., 2018). In the United States, for example, state park systems play a central role in delivering nature recreation services, highlighting the importance of publicly provided natural areas (Siikamäki, 2010).

The benefits of nature-based recreation are well documented, ranging from spiritual experiences and enhanced well-being to strengthened family relationships and community cohesion (Heintzman, 2016; Lee & Graefe, 2010). These activities contribute to individual health and societal sustainability by providing physical, aesthetic, and cultural benefits (Ballew & Omoto, 2010; IIhtimanski et al., 2020). Urban recreation environments, in particular, have been shown to positively influence residents' happiness and quality of life (Kang et al., 2021). Furthermore, advancements in technology have expanded the scope of nature-based recreation, enabling virtual experiences and digital platforms that facilitate outdoor activities and fitness tracking (Williams, 2024; Capdevila et al., 2024) .

Despite the extensive research on nature-based recreation and benefits of urban parks, few studies have focused on how students engage with these environment or the factors that influence their participation in nature-based activities. This gap is especially relevant in the context of rapid urbanization and the growing need for sustainable urban development.

Determinants of factors influencing university student's recreation activities

Research has identified a wide range of factors that influence students participation in nature-based recreation activities. These factors can be broadly categorized into environmental, individual and social demographic determinants.

Environmental factors play a significant role in shaping recreational preferences. The characteristics of landscape elements, vegetation coverage, and aesthetic quality directly impact students' engagement with nature environments(Wang et al., 2021). Additionally, the visual quality of recreational infrastructure and the typologies of green infrastructure, such as urban forests or tree-lined streets, influence the variety and appeal of recreational activities (Gundersen & Vistad, 2016; Soga & Gaston, 2016). Accessibility ot nature-based tourism and recreation is also closely tied to land-use management practice, which determine the availability and quality of recreational spaces (Hughes et al., 2013).

Individual and social demographic factors significantly shape students' recreation preferences. Studies have shown that gender, age, and academic discipline are positively associated with participation in campus green space (Liu et al., 2022). However, other research suggests minimal differences in outdoor recreation preferences across race and gender, highlighting the complexity of these influences(Teona, 2017). Cultural background and socioeconomic status also play a role, as different cultural groups perceive nature recreation diversely, and racial identity can influence youth's connection to nature (Johnson et al., 2005; Lackey et al., 2022). At the Individual-level, factors such as environmental knowledge, travel distance, education background, and group type, significantly predict recreational motivations and behaviors (Ge et al., 2023; Lee & Graefe, 2010). For instance, travelling companions -whether alone, with friends, or with partners- exhibits diverse activity patterns in nature-based tourism (Chen et al., 2016). The Covid-19 pandemic has further complicated these dynamics, as travel risk perception and restrictions have altered students' attitudes and behaviors toward nature toursim (Perić et al., 2021; Frank, 2021). These findings underscore the multifaceted nature of individual and social demographic influences on recreation preferences.

Therefore, in this study summarize the key factors influencing students' recreation activities as follow（Table 1）. These elements collectively shape students' preferences and behaviors in urban parks. Building this framework, the research aims to offer actionable insights for enhancing urban park design and management to better meet the needs of university students.

Table 1: Factors influencing university students' recreation activities in urban parks

Category	Factors	Description of factors
Environmental	Landscape elements	Physical features such as water bodies, hills, or open fields that enhance the aesthetic and functional appeal of recreational spaces. These elements create diverse settings for activities like hiking, picnicking, or photography.
	Vegetation coverage	The extent and type of plant life in a recreational area, which provides shade, improve air quality, and create a natural ambiance. Dense vegetation often attracts visitors seeking tranquility and connection with nature.
	Aesthetic quality	The visual attractiveness of a recreational environment, including scenic beauty and harmony. High aesthetic quality can evoke positive emotions and increase the likelihood of repeated visits.
	Accessibility	The ease with which individuals can reach and use recreational spaces, influenced by proximity, transportation networks, and land-use management. High accessibility encourages frequent visitation.
	Infrastructure	Facilities such as trails, benches, playgrounds, and restrooms that support recreational activities. Well-maintained infrastructure enhances users comfort and accessibility.

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Individual and Social demographic	Gender	The influence of gender identity on activity preferences, with studies suggesting differences in how men and women engage with nature-based recreation. For example, women may prioritize safety and social activities more than men.
	Age	The impact of age on recreational choices, as younger individuals may prefer active or social activities, which older individuals may seek relaxation or solitude.
	Major	The field of study, which can shape students' environmental awareness and interest in nature-based activities. For instance, environmental science students may show great engagement in ecological activities.
	Socioeconomic status	Economic resources and social standing that affect access to recreational facilities and participation in certain activities. Higher socioeconomic status may enable more frequent and diverse recreational experiences.
	Environmental knowledge	An individuals' understanding of ecological systems and sustainability, which can shape their attitudes toward nature-based recreation. Greater knowledge often correlates with stronger environmental stewardship.
	Companionship	The composition of recreational groups, such as travelling alone, with friends, or with family, which influences activity patterns and preferences. Group dynamics can enhance enjoyment and social bonding.
	Pandemic impacts	Changes in recreational behaviors due to pandemic-related restrictions and risk perception. The pandemic has heightened the importance of outdoor spaces for mental health and safe social interaction.

Methodology

This study employ a quantitative research approach to measure the preferences of Chinese university students for nature-based recreation activities in urban parks. The methodology is designed to ensure robust data collection and analysis, providing reliable insights into the research questions. The following sections outline the research design, data collection methods and analytical techniques used in this study.

Research Design

The study adopts a cross-sectional survey design to collect data from the sample of Chinese university students. This design allows for the efficient collection of data at a single point in time, enabling the analysis of relationships between key variables that influence creation preferences. Specifically, the study examines the interplay of environmental factors(e.g., park accessibility, landscape elements, infrastructure quality) and individual and social demographic factors(e.g., gender, age, environmental knowledge) on students' preferences for nature-based recreation activities in urban parks.

Data Collection

Sampling

Chinese university student who have visited urban parks for recreation were recruited to join in the sampling process. The questionnaire is distributed online via platforms in Yibiaoda, a well known online survey website for Guangdong Province users, ensuring wide reach and ease of participation. After identifying the result of the participants, finally selected 410 participants for taking the questionnaire.

Survey Design

A structured questionnaire is developed to collect data according to the designated questions. The questionnaire consists of the following sections: demographic information, park usage patterns, preference measurement, and influencing factors. Demographic information will collect gender, age, major and year of study, and family monthly income. Park usage patterns will calculate the frequency of park visit, duration of visits, and preferred activities. Preference measurement will apply a 5-point Likert scale to measure the preferences for various activities ranging from "strongly dislike"(1) to "strongly like"(5). Influencing factors will consist questions of environmental, individual and social demographic factors using the 5 point scale to rating outcome of influencing intention, ranging from "not influence at all"(1) to "very strong influence "(5).

Multiple Linear Regression Analysis

A multiple linear regression model is employed to quantify the impact of independent variables on students' preferences for nature-based recreation activities. The model is specified as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \bullet\bullet\bullet + \beta_k X_k + \in$$

Where:

Y: Preference score for a specific activity (dependent variable);

β_0: Intercept term;

$\beta_1, \beta_2, \ldots, \beta_k$: Regression coefficients for independent variables;

$X_1, X_2, \ldots, X_k$: Independent variables (e.g., gender, park accessibility, group type)

$\in$: Error term.

Table 2: Variables in the Regression Model

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Variables Type	Variable Name
Dependent Variables	Preference scores for 12 activities: Walking B. Jogging/Exercising C. Picnicking D. Photography E.Socializing with friends F. Meditating G. Outdoor sports H.Bird watching /Observing plants I. Dog walking J. Reading K. Board games /Cards L. Sunbathing
Independent Variables	Environmental factors: Landscape elements, Vegetation coverage, Aesthetic quality, Accessibility, Infrastructure
	Individual and social demographic factors: Gender, Age, Academic discipline, Socioeconomic status, Environmental knowledge, Companionship, Pandemic impacts

The regression analysis aims to identify the relative influence of each independent variable on students' preferences for specific activities. Variables such as gender, age, family income, park accessibility, and group type are included to access their significance. The model is tested for multicollinearity, heteroscedasticity, and normality of residuals to ensure the robustness of the results. The findings from this analysis provide insights into the key factors shaping students' engagement in nature-based recreation activities in urban parks.

Discussion and Implications

The sample consisted of 410 participants （Table 3）, predominantly female (68.05%, n=279), aged 21-23 (55.37%, n=227), and seniors (37.80%, n=155). Over 20% of the sample majored in Management, and the majority reported a family monthly income of 10,000-20,000 RMB (42.93%, n=176), with 34.63% (n=142) earning above 20,000 RMB. Most participants visited parks 1-3 times per month (56.34%, n=231).

Table 3：Frequency Analysis of Demographic and Characteristics of Survey Respondents

Variable	Option	Frequency	Percentage(%)	Cumulative Percentage(%)
Gender	Male	131	31.95	100
	Female	279	68.05	68.05
Age	18-20 years	111	27.07	27.07
	21-23 years	227	55.37	82.44
	24years or older	72	17.56	100
Year of Study	Freshman	34	8.29	8.29
	Sophomore	91	22.2	62.2
	Junior	130	31.71	40
	Senior	155	37.8	100
Major	Agricultural Science	7	1.71	1.71
	Medical Science	38	9.27	10.98
	History	5	1.22	12.2
	Philosophy	1	0.24	12.44
	Engineering	63	15.37	27.8
	Education	28	6.83	34.63
	Literature	45	10.98	45.61
	Law	9	2.2	47.8
	Science	73	17.8	65.61
	Management	82	20	85.61
	Economics	34	8.29	93.9
	Arts	25	6.1	100
Family Monthly Income	Below 5,000 RMB	19	4.63	100
	5000-10000 RMB	73	17.8	95.37
	10000-20000 RMB	176	42.93	42.93
	Above 20000 RMB	142	34.63	77.56
Park Visits	Less than once	31	7.56	100
	1-3 times	231	56.34	56.34
	4-6 times	110	26.83	83.17
	More than 7 times	38	9.27	92.44

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Total	410	100	100

According the descriptive statistics of activity preference (Table 4), walking (Mean= 4.432) and Sunbathing (Mean=4.390) were the most preferred activities. Board Games/ Cards (Mean =3.385) and Dog walking (Mean=3.512) were the least preferred activities.

Table 4: Descriptive Statistics of Activity Preferences and Influencing Factors

Variable	Sample Size	Minimum	Maximum	Mean	Standard Deviation
Walking Preference	410	2	5	4.432	0.661
Jogging/ Exercising Preference	410	1	5	3.634	0.905
Picnicking Preference	410	1	5	3.99	0.862
Photography Preference	410	1	5	3.944	0.853
Socializing Preference	410	1	5	4.173	0.77
Meditation Preference	410	1	5	3.876	0.921
Outdoor Sports Preference	410	1	5	3.846	0.892
Bird Watching/ Plant Observation Preference	410	1	5	3.834	0.888
Dog Walking Preference	410	1	5	3.512	1.056
Reading/ Study Preference	410	1	5	3.605	1.051
Board Games/ Cards Preference	410	1	5	3.385	1.05
Sunbathing Preference	410	1	5	4.39	0.756
Influence of Landscape Elements	410	1	5	4.024	0.818
Influence of Vegetation Coverage	410	1	5	4.18	0.825
Influence of Aesthetic Quality	410	1	5	4.249	0.801
Influence of Infrastructure	410	1	5	4.085	0.797
Influence of Accessibility	410	1	5	4.102	0.887
Influence of Environmental Knowledge	410	1	5	3.727	0.922
Influence of Companionship	410	1	5	3.9	0.942
Influence of Pandemic	410	1	5	3.949	0.943

Table 5： Linear Regression Analysis Result for Walking Preference (n=410)

	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			VIF	Tolerance
Constant	2.256	0.304	-	7.415	0.000**	-	-
Gender	0.005	0.065	0.003	0.074	0.941	1.086	0.921
Age	-0.055	0.06	-0.055	-0.92	0.358	1.845	0.542
Year of Study	-0.017	0.041	-0.026	-0.427	0.67	1.828	0.547
Major	0.015	0.008	0.083	1.813	0.071	1.073	0.932
Family Monthly Income	0.121	0.035	0.153	3.416	0.001**	1.025	0.976
Influence of Companionship	-0.032	0.035	-0.046	-0.922	0.357	1.243	0.804
Influence of Pandemic	-0.023	0.034	-0.033	-0.681	0.496	1.22	0.82
Influence of Landscape Elements	0.167	0.044	0.207	3.804	0.000**	1.505	0.664
Influence of Vegetation Coverage	0.078	0.042	0.097	1.839	0.067	1.431	0.699
Influence of Aesthetic Quality	0.15	0.044	0.181	3.428	0.001**	1.428	0.7
Influence of Infrastructure	0.032	0.042	0.039	0.766	0.444	1.303	0.768
Influence of Accessibility	0.061	0.036	0.081	1.679	0.094	1.197	0.836
Influence of Environmental Knowledge	0.02	0.036	0.028	0.555	0.579	1.288	0.776

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R 2	0.223
Adjusted R 2	0.197
F-statistic	F (13,396)=8.727,p=0.000

Dependent Variable: Walking Preference
Significance Levels: * p<0.05 ** p<0.01

Table 6: Linear Regression Analysis Result for Jogging/Exercising Preference (n=410)

	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			VIF	Tolerance
Constant	1.529	0.451	-	3.393	0.001**	-	-
Gender	-0.12	0.097	-0.062	-1.241	0.215	1.086	0.921
Age	0.126	0.089	0.092	1.421	0.156	1.845	0.542
Year of Study	-0.004	0.061	-0.005	-0.072	0.943	1.828	0.547
Major	-0.001	0.012	-0.006	-0.125	0.901	1.073	0.932
Family Monthly Income	0.141	0.052	0.131	2.707	0.007**	1.025	0.976
Influence of Companionship	-0.018	0.051	-0.019	-0.353	0.724	1.243	0.804
Influence of Pandemic	0.027	0.051	0.028	0.523	0.602	1.22	0.82
Influence of Landscape Elements	0.043	0.065	0.039	0.661	0.509	1.505	0.664
Influence of Vegetation Coverage	0.078	0.063	0.072	1.248	0.213	1.431	0.699
Influence of Aesthetic Quality	0.04	0.065	0.035	0.612	0.541	1.428	0.7
Influence of Infrastructure	0.101	0.062	0.089	1.629	0.104	1.303	0.768
Influence of Accessibility	0.051	0.053	0.05	0.959	0.338	1.197	0.836
Influence of Environmental Knowledge	0.087	0.053	0.089	1.635	0.103	1.288	0.776
R 2	0.091						
Adjusted R 2	0.061						
F-statistic	F (13,396)=3.056,p=0.000						

Dependent Variable: Jogging/Exercising Preference
Significance Levels: * p<0.05 ** p<0.01

Table 7: Linear Regression Analysis Result for Picnicking Preference (n=410)

	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			VIF	Tolerance
Constant	2.092	0.424	-	4.928	0.000**	-	-
Gender	0.313	0.091	0.17	3.435	0.001**	1.086	0.921
Age	-0.075	0.084	-0.057	-0.893	0.372	1.845	0.542
Year of Study	-0.016	0.057	-0.018	-0.282	0.778	1.828	0.547
Major	0.002	0.011	0.008	0.153	0.878	1.073	0.932
Family Monthly Income	0.089	0.049	0.087	1.811	0.071	1.025	0.976
Influence of Companionship	0.172	0.048	0.188	3.559	0.000**	1.243	0.804
Influence of Pandemic	-0.028	0.048	-0.031	-0.587	0.558	1.22	0.82
Influence of Landscape Elements	0.049	0.061	0.046	0.798	0.426	1.505	0.664
Influence of Vegetation Coverage	-0.005	0.059	-0.005	-0.082	0.934	1.431	0.699
Influence of Aesthetic Quality	0.043	0.061	0.04	0.707	0.48	1.428	0.7
Influence of Infrastructure	-0.016	0.058	-0.014	-0.267	0.789	1.303	0.768
Influence of Accessibility	0.022	0.05	0.022	0.429	0.668	1.197	0.836
Influence of Environmental Knowledge	0.09	0.05	0.096	1.791	0.074	1.288	0.776
R 2	0.112						
Adjusted R 2	0.082						

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F-statistic	F (13,396)=3.824,p=0.000

Dependent Variable: Picnicking Preference

Significance Levels: * p<0.05 ** p<0.01

Table 8：Linear Regression Analysis Result for Photography Preference (n=410)

	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			VIF	Tolerance
Constant	2.125	0.415	-	5.119	0.000**	-	-
Gender	0.15	0.089	0.082	1.681	0.093	1.086	0.921
Age	-0.057	0.082	-0.044	-0.697	0.487	1.845	0.542
Year of Study	-0.021	0.056	-0.024	-0.372	0.71	1.828	0.547
Major	0.03	0.011	0.132	2.718	0.007**	1.073	0.932
Family Monthly Income	0.052	0.048	0.051	1.077	0.282	1.025	0.976
Influence of Companionship	0.022	0.047	0.024	0.459	0.647	1.243	0.804
Influence of Pandemic	0.004	0.047	0.005	0.092	0.927	1.22	0.82
Influence of Landscape Elements	0.119	0.06	0.114	1.98	0.048*	1.505	0.664
Influence of Vegetation Coverage	0.011	0.058	0.011	0.198	0.843	1.431	0.699
Influence of Aesthetic Quality	0.12	0.06	0.112	2.009	0.045*	1.428	0.7
Influence of Infrastructure	-0.108	0.057	-0.101	-1.889	0.06	1.303	0.768
Influence of Accessibility	0	0.049	0	-0.008	0.994	1.197	0.836
Influence of Environmental Knowledge	0.193	0.049	0.208	3.92	0.000**	1.288	0.776
R 2	0.132						
Adjusted R 2	0.104						
F-statistic	F (13,396)=4.649,p=0.000						

Dependent Variable: Photography Preference

Significance Levels: * p<0.05 ** p<0.01

Table 9：Linear Regression Analysis Result for Socializing Preference (n=410)

	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			VIF	Tolerance
Constant	2.589	0.379	-	6.834	0.000**	-	-
Gender	0.114	0.081	0.069	1.402	0.162	1.086	0.921
Age	-0.148	0.075	-0.127	-1.976	0.049*	1.845	0.542
Year of Study	0.007	0.051	0.009	0.136	0.892	1.828	0.547
Major	0.012	0.01	0.059	1.194	0.233	1.073	0.932
Family Monthly Income	0.022	0.044	0.024	0.5	0.617	1.025	0.976
Influence of Companionship	0.107	0.043	0.131	2.479	0.014*	1.243	0.804
Influence of Pandemic	-0.05	0.043	-0.061	-1.164	0.245	1.22	0.82
Influence of Landscape Elements	0.03	0.055	0.032	0.544	0.587	1.505	0.664
Influence of Vegetation Coverage	0.054	0.053	0.058	1.026	0.305	1.431	0.699
Influence of Aesthetic Quality	0.019	0.054	0.02	0.345	0.73	1.428	0.7
Influence of Infrastructure	0.052	0.052	0.054	0.998	0.319	1.303	0.768
Influence of Accessibility	0.105	0.045	0.121	2.344	0.020*	1.197	0.836
Influence of Environmental Knowledge	0.061	0.045	0.072	1.348	0.179	1.288	0.776
R 2	0.113						
Adjusted R 2	0.084						
F-statistic	F (13,396)=3.885,p=0.000						

Dependent Variable: Socializing Preference

Significance Levels: * p<0.05 ** p<0.01

Table 10：Linear Regression Analysis Result for Meditation Preference (n=410)

	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			VIF	Tolerance
Constant	1.179	0.441	-	2.674	0.008**	-	-
Gender	0.166	0.095	0.084	1.757	0.08	1.086	0.921
Age	0.127	0.087	0.092	1.462	0.144	1.845	0.542
Year of Study	0.027	0.059	0.028	0.455	0.649	1.828	0.547
Major	-0.02	0.012	-0.082	-1.708	0.088	1.073	0.932
Family Monthly Income	0.016	0.051	0.015	0.317	0.751	1.025	0.976
Influence of Companionship	-0.079	0.05	-0.08	-1.564	0.119	1.243	0.804
Influence of Pandemic	0.028	0.05	0.029	0.562	0.575	1.22	0.82
Influence of Landscape Elements	0.145	0.064	0.129	2.278	0.023*	1.505	0.664
Influence of Vegetation Coverage	0.074	0.061	0.067	1.207	0.228	1.431	0.699
Influence of Aesthetic Quality	0.031	0.063	0.027	0.484	0.629	1.428	0.7
Influence of Infrastructure	0.035	0.061	0.031	0.581	0.562	1.303	0.768
Influence of Accessibility	0.057	0.052	0.054	1.08	0.281	1.197	0.836
Influence of Environmental Knowledge	0.256	0.052	0.256	4.895	0.000**	1.288	0.776
R 2	0.159						
Adjusted R 2	0.132						
F-statistic	F (13,396)=5.771,p=0.000						

Dependent Variable: Meditation Preference

Significance Levels: * p<0.05 ** p<0.01

Table 11：Linear Regression Analysis Result for Outdoor Sports Preference (n=410)

	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			VIF	Tolerance
Constant	1.484	0.435	-	3.407	0.001**	-	-
Gender	-0.095	0.093	-0.05	-1.021	0.308	1.086	0.921
Age	0.075	0.086	0.055	0.868	0.386	1.845	0.542
Year of Study	-0.013	0.059	-0.014	-0.214	0.83	1.828	0.547
Major	0.007	0.012	0.028	0.566	0.572	1.073	0.932
Family Monthly Income	0.092	0.05	0.087	1.823	0.069	1.025	0.976
Influence of Companionship	0.014	0.05	0.015	0.291	0.771	1.243	0.804
Influence of Pandemic	0.07	0.049	0.074	1.427	0.155	1.22	0.82
Influence of Landscape Elements	-0.001	0.063	-0.001	-0.021	0.983	1.505	0.664
Influence of Vegetation Coverage	0.084	0.061	0.078	1.39	0.165	1.431	0.699
Influence of Aesthetic Quality	0.062	0.062	0.056	0.99	0.323	1.428	0.7
Influence of Infrastructure	0.01	0.06	0.009	0.159	0.874	1.303	0.768
Influence of Accessibility	0.113	0.052	0.113	2.193	0.029*	1.197	0.836
Influence of Environmental Knowledge	0.175	0.052	0.181	3.391	0.001**	1.288	0.776
R 2	0.126						
Adjusted R 2	0.098						
F-statistic	F (13,396)=4.399,p=0.000						

Dependent Variable: Outdoor Sports Preference

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Significance Levels: * p<0.05 ** p<0.01

Table 12: Linear Regression Analysis Result for Bird Watching/ Plant Observation Preference (n=410)

	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			VIF	Tolerance
Constant	2.98	0.442	-	6.748	0.000**	-	-
Gender	-0.102	0.095	-0.054	-1.074	0.284	1.086	0.921
Age	0.08	0.087	0.06	0.921	0.358	1.845	0.542
Year of Study	-0.076	0.059	-0.083	-1.286	0.199	1.828	0.547
Major	-0.009	0.012	-0.037	-0.747	0.456	1.073	0.932
Family Monthly Income	0.029	0.051	0.028	0.572	0.568	1.025	0.976
Influence of Companionship	-0.059	0.05	-0.062	-1.17	0.243	1.243	0.804
Influence of Pandemic	-0.106	0.05	-0.113	-2.135	0.033*	1.22	0.82
Influence of Landscape Elements	0.156	0.064	0.144	2.455	0.015*	1.505	0.664
Influence of Vegetation Coverage	0.078	0.062	0.072	1.266	0.206	1.431	0.699
Influence of Aesthetic Quality	0.019	0.063	0.017	0.292	0.77	1.428	0.7
Influence of Infrastructure	0.013	0.061	0.012	0.216	0.829	1.303	0.768
Influence of Accessibility	-0.011	0.052	-0.011	-0.207	0.836	1.197	0.836
Influence of Environmental Knowledge	0.178	0.052	0.185	3.41	0.001**	1.288	0.776
R 2	0.094						
Adjusted R 2	0.064						
F-statistic	F (13,396)=3.149,p=0.000						

Dependent Variable: Bird Watching/ Plant Observation Preference

Significance Levels: * p<0.05 ** p<0.01

Table 13: Linear Regression Analysis Result for Dog Walking Preference (n=410)

	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			VIF	Tolerance
Constant	2.088	0.527	-	3.96	0.000**	-	-
Gender	0.152	0.113	0.067	1.343	0.18	1.086	0.921
Age	0.011	0.104	0.007	0.101	0.919	1.845	0.542
Year of Study	-0.011	0.071	-0.01	-0.159	0.874	1.828	0.547
Major	-0.022	0.014	-0.079	-1.582	0.114	1.073	0.932
Family Monthly Income	-0.012	0.061	-0.009	-0.195	0.845	1.025	0.976
Influence of Companionship	0.145	0.06	0.129	2.418	0.016*	1.243	0.804
Influence of Pandemic	-0.04	0.059	-0.035	-0.666	0.506	1.22	0.82
Influence of Landscape Elements	0.07	0.076	0.054	0.919	0.359	1.505	0.664
Influence of Vegetation Coverage	-0.022	0.074	-0.017	-0.297	0.767	1.431	0.699
Influence of Aesthetic Quality	-0.002	0.076	-0.001	-0.026	0.979	1.428	0.7
Influence of Infrastructure	-0.036	0.073	-0.027	-0.495	0.621	1.303	0.768
Influence of Accessibility	0.001	0.063	0.001	0.011	0.991	1.197	0.836
Influence of Environmental Knowledge	0.24	0.062	0.21	3.845	0.000**	1.288	0.776
R 2	0.086						
Adjusted R 2	0.056						
F-statistic	F (13,396)=2.881,p=0.001						

Dependent Variable: Dog Walking Preference

Significance Levels: * p<0.05 ** p<0.01

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Table 14：Linear Regression Analysis Result for Reading/Study Preference (n=410)

	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			VIF	Tolerance
Constant	0.981	0.498	-	1.969	0.050*	-	-
Gender	0.168	0.107	0.075	1.571	0.117	1.086	0.921
Age	0.095	0.098	0.06	0.962	0.337	1.845	0.542
Year of Study	-0.025	0.067	-0.023	-0.377	0.706	1.828	0.547
Major	-0.004	0.013	-0.014	-0.292	0.77	1.073	0.932
Family Monthly Income	0.062	0.058	0.05	1.079	0.281	1.025	0.976
Influence of Companionship	0.012	0.057	0.011	0.212	0.832	1.243	0.804
Influence of Pandemic	0.062	0.056	0.056	1.112	0.267	1.22	0.82
Influence of Landscape Elements	-0.023	0.072	-0.018	-0.32	0.749	1.505	0.664
Influence of Vegetation Coverage	-0.03	0.07	-0.024	-0.437	0.662	1.431	0.699
Influence of Aesthetic Quality	-0.013	0.072	-0.01	-0.175	0.861	1.428	0.7
Influence of Infrastructure	0.096	0.069	0.073	1.394	0.164	1.303	0.768
Influence of Accessibility	0.022	0.059	0.019	0.374	0.708	1.197	0.836
Influence of Environmental Knowledge	0.42	0.059	0.368	7.107	0.000**	1.288	0.776
R 2	0.176						
Adjusted R 2	0.149						
F-statistic	F (13,396)=6.508,p=0.000						

Dependent Variable: Reading/Study Preference

Significance Levels: * p<0.05 ** p<0.01

Table 15：Linear Regression Analysis Result for Board Games/Cards Preference (n=410)

	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			VIF	Tolerance
Constant	1.668	0.504	-	3.308	0.001**	-	-
Gender	-0.076	0.108	-0.034	-0.701	0.484	1.086	0.921
Age	-0.029	0.1	-0.018	-0.287	0.774	1.845	0.542
Year of Study	0.1	0.068	0.092	1.471	0.142	1.828	0.547
Major	-0.005	0.013	-0.018	-0.367	0.714	1.073	0.932
Family Monthly Income	0.009	0.058	0.007	0.152	0.879	1.025	0.976
Influence of Companionship	0.289	0.057	0.259	5.03	0.000**	1.243	0.804
Influence of Pandemic	0.08	0.057	0.072	1.413	0.158	1.22	0.82
Influence of Landscape Elements	0.034	0.073	0.026	0.461	0.645	1.505	0.664
Influence of Vegetation Coverage	-0.007	0.07	-0.006	-0.103	0.918	1.431	0.699
Influence of Aesthetic Quality	-0.198	0.072	-0.151	-2.739	0.006**	1.428	0.7
Influence of Infrastructure	0.005	0.069	0.004	0.072	0.942	1.303	0.768
Influence of Accessibility	-0.006	0.06	-0.005	-0.103	0.918	1.197	0.836
Influence of Environmental Knowledge	0.241	0.06	0.212	4.04	0.000**	1.288	0.776
R 2	0.155						
Adjusted R 2	0.128						
F-statistic	F (13,396)=5.598,p=0.000						

Dependent Variable: Board Games/ Cards Preference

Significance Levels: * p<0.05 ** p<0.01

Table 16：Linear Regression Analysis Result for Sunbathing Preference (n=410)

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	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			VIF	Tolerance
Constant	2.542	0.372	-	6.829	0.000**	-	-
Gender	0.047	0.08	0.029	0.587	0.558	1.086	0.921
Age	0.011	0.073	0.009	0.147	0.883	1.845	0.542
Year of Study	0.015	0.05	0.019	0.293	0.77	1.828	0.547
Major	0.018	0.01	0.092	1.867	0.063	1.073	0.932
Family Monthly Income	-0.015	0.043	-0.016	-0.342	0.732	1.025	0.976
Influence of Companionship	-0.016	0.042	-0.02	-0.373	0.709	1.243	0.804
Influence of Pandemic	-0.033	0.042	-0.041	-0.783	0.434	1.22	0.82
Influence of Landscape Elements	0.08	0.054	0.087	1.493	0.136	1.505	0.664
Influence of Vegetation Coverage	0.088	0.052	0.096	1.699	0.09	1.431	0.699
Influence of Aesthetic Quality	0.156	0.053	0.165	2.923	0.004**	1.428	0.7
Influence of Infrastructure	0.017	0.051	0.018	0.341	0.733	1.303	0.768
Influence of Accessibility	0.023	0.044	0.027	0.515	0.607	1.197	0.836
Influence of Environmental Knowledge	0.086	0.044	0.104	1.941	0.053	1.288	0.776
R 2	0.111						
Adjusted R 2	0.082						
F-statistic	F (13,396)=3.792,p=0.000						

Dependent Variable: Sunbathing Preference

Significance Levels: * p<0.05 ** p<0.01

Through multiple linear regression analyses, the research identified key determinants of student's engagement in 12 different activities, highlighting the role of environmental, individual and social demographic factors. Below, we discuss the findings for each activity and their implications for urban park planning and management.

1.Walking (Table 5): Family monthly income (β=0.121, t=3.416, p=0.001), landscape elements (β=0.167, t=3.804, p=0.000) , and aesthetic quality (β=0.150, t=3.428, p=0.001) significantly positively influenced walking preferences. This suggests that students from higher-income families and those value scenic beauty and well-designed landscapes are more likely to enjoy walking.

2.Jogging/ Exercising (Table 6): Family monthly income (β=0.141, t=2.707,p=0.007) had a significant positive impact on jogging preferences. This indicates that students from higher-income families may have better access to fitness resources or more leisure time for exercise. Parks could consider adding more fitness equipment and jogging trails to attract a broader demographic.

3.Picnicking(Table 7): Gender (β =0.313, t=3.435, p=0.001) and companionship significantly influenced picnicking preferences, with female students and those visiting with friends or family showing higher engagement. This highlights the social nature of picnicking and the importance of providing spacious grassy areas for group activities.

4. Photography(Table 8): Major (β=0.03, t=2.718, p=0.007), landscape elements (β=0.119, t=1.980, p=0.048), aesthetic quality (β =0.120, t=2.009, p=0.045), and environmental knowledge (β =0.193, t=3.920, p=0.000) positively affected photography preferences. Students with a background in arts or related fields, as well as those with a greater appreciation for nature, were more likely to enjoy photography. Parks could enhance their appeal by incorporating visual elements and promoting environmental education.

5. Socializing with friends(Table 9): Age (β=-0.148, t=-1976, p=0.049) had a significant negative impact on socializing preference, suggesting that younger students are more inclined to engage in group activities. Companionship (β=0.107, t=2.479, p=0.014) and park accessibility (β=0.105, t=2.344, p=0.020) also played positive roles, emphasizing the need for parks to provide convenient transportation links and space conducive to social interaction.

6. Meditation (Table 10): Landscape elements (β=0.145, t=2.278, p=0.023) and environmental knowledge (β=0.256, t=4.895, p=0.000) positively influenced meditation preferences. Students who valued natural settings and had a deeper understanding of environmental conservation were more likely to enjoy meditative activities. Parks could create quiet, serene areas with natural features to cater to this preference.

7. Outdoor Sports (Table 11): Accessibility (β=0.113, t=2.193, p=0.029) and environmental knowledge (β=0.175, t=3.391, p=0.001) positively impacted outdoor sports preferences. Improving park transportation accessibility and promoting environmental awareness could encourage more students to participate in outdoor sports.

8. Bird watching/ Plant Observation (Table 12): Landscape elements (β=0.156, t=2.455, p=0.015) and environmental knowledge (β=0.178, t=3.410, p=0.001) positively influenced bird watching preferences, while the impact of pandemic (β=-

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0.106, t=-2.135, p=0.033) had a negative effect. This suggests that while natural features and environmental education are important, external factors like health concerns can deter participation.

9. Dog Walking (Table 13): Companionship (β=0.145, t=2.418, p=0.016) and environmental knowledge (β=0.240, t=3.845, p=0.000) positively influenced dog walking preferences. Park could consider adding pet-friendly facilities to attract dog owners.

10. Reading/ Study(Table 14): Environmental knowledge (β =0.420, t=7.107, p=0.000) had a strong positive impact on reading preferences, indicating that students with a greater appreciation for nature are more likely to use parks for quiet activities. Providing shaded seating areas and quiet zones could enhance this experience.

11. Board Games/Cards(Table 15): Companionship (β=0.289, t=5.030, p=0.000) and environmental knowledge (β=0.241, t=4.040, p=0.000) positively influenced preferences for board games, while aesthetic quality (β=-0.198, t=-2.379, p=0.006) had a negative effect. This suggests that students prioritize social interaction over scenic beauty for such activities. Parks could create designated areas for group games.

12. Sunbathing(Table 16): Aesthetic quality(β =0.156, t=2.923, p=0.004) positively influenced sunbathing preferences, highlighting the importance of aesthetically pleasing environments for relaxation activities.

Conclusion

The study offers valuable insights into the preferences of Chinese university students for nature-based recreation activities in urban parks and the factors shaping their choices. By employing a multiple linear regression analysis, the research identified key determinants of students' engagement in various activities, highlighting the interplay between environmental features, individual characteristics, and social dynamics. The results demonstrate that students are drawn to activities such as walking, picnicking and socializing, with factors like family income, gender, and park accessibility significantly influencing their preferences. Environmental knowledge and the aesthetic quality of parks were also found to enhance students' enjoyment of activities like photography, mediation, and outdoor sports. Notably, the Covid-19 pandemic had a impact of reducing interest in certain activities while underscoring the importance of parks as safe spaces for mental and physical well-being. These findings emphasize the need for urban parks to prioritize accessibility, aesthetic design, and environmental education to better meet the recreational needs of students. For example, parks could integrate more visually appealing elements, such as water features and flower gardens, while ensuring facilities like trails, seating areas, and fitness equipment are well-maintained and accessible. Additionally, fostering environmental awareness through educational programs could further encourage students to engage with nature.

Limitation

This study has several limitations that should be acknowledge. First, the sample is limited to Chinese University students in Guangdong Province, which may restrict the finding to other demographic groups. Cultural differences in recreation preferences and park usage pattern may not be fully addressed. The sample was predominantly female (68.05%) and senior students (37.80%), which may limit the generalization capacity of the findings. Future research could include a more balanced demographic representation. Additionally, the study focuses on perceived environmental factors (e.g., landscape elements, vegetation coverage) rather than objective measurement. And the certain factors, such as vegetation coverage and infrastructure, did not show a significant influence on students' preferences for nature-based recreation activities. This lack of impact may be attributed to the design of the questionnaire, where these factors were not describe in sufficient detail or clear and accessible language. To address this issue, future research could ensure factors are explained in simpler, more relatable terms. Besides, the use of multiple linear regression analysis assumes linear relationships between different variables, which may not always hold true and reflect the complexity of real-world preference. Future exploration will use mixed methods to complement quantitative data with qualitative insights, such as interviews or focus groups. By addressing these limitations, future studies can further enhance the applicability of the findings.

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Conflict of Interest

The authors declare no conflict of interest.

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Appendix:

A Survey on Preferences for Nature-based Recreation Activities in Urban Parks among Chinese University Students in Guangdong Province

To provide you with better tourism services, we kindly ask for a few minutes of your time to share your feelings and suggestions. We highly value your feedback and appreciate your participation! Let's get started now!

Part 1: Demographic Information

1.What is your gender?
Male B. Female
2.What is your age?
Under 18 B. 18-20 C.21-23 D.24or older
3.What is your year of study?
Freshmen B. Sophomore C. Junior D. Senior E. Other, please specify:
4.What is your major?
Science B. Engineering C. Medical Science D. Agricultural Science
E.Literature F. History G. Philosophy H. Economics
Management J. Law K. Education L. Arts
5.What is your family's monthly income?
Less than 5,000 RMB B. 5,000-10,000RMB
C.10000-20000RMB D.More than 20000RMB

Part 2: Park Usage Patterns

6.How often do you visit parks each month?
Less than once B. 1-3 times C. 4-6 times D. More than 7 times
7.What are your main purposes for visiting park? (Multiple choices)
Walking B. Jogging/Exercising C. Picnicking D. Photography
Socializing with friends F. Mediating G. Outdoor sports
H. Bird watching/ Observing plants I. Dog walking J. Reading/Study
K. Board games/ Cards L. Sunbathing M.Other, please specify:
8. How long do you usually stay in the park during each visit?
A. Less than 30 minutes B. 30 minutes to 1 hour
C. 1-2 hours D. More than 2 hours

Part 3: Activity Preferences

Please rate your preference for the following activities in urban parks (1 = Strongly dislike, 5 = Strongly like):
9. Walking leisurely on park trails and enjoying the scenery.
10. Jogging or using fitness equipment in the park.
11. Picnicking on the grass with friends or family.
12. Taking photos or recording videos of the scenery in the park.
13. Socializing and chatting with friends in the park.
14. Meditating or relaxing quietly in the park.
15. Participating in outdoor sports (e.g., badminton, table tennis).
16. Observing birds or plants and learning about nature.
17. Walking a pet dog and enjoying interactions with the pet.
18. Reading books or studying in the park.
19. Playing board games or cards with friends in the park.
20. Sunbathing and enjoying the sunshine in the park.

Part 4: Influencing Factors

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21.To what extent do the following factors influence your choice of activities in urban parks? (1 = No influence at all, 5 = Very strong influence):

22.How much do natural or artificial landscape elements (e.g., water features, hills, flower beds) influence your choice of park activities?

23.How much does vegetation coverage (e.g., the quantity and distribution of trees, grass, and plants) influence your choice of park activities?

24.How much does the scenic beauty and visual appeal of the park influence your choice of park activities?

25.How much does the quality of park facilities (e.g., trails, benches, lighting) influence your choice of park activities?

26.How much does the convenience of transportation to the park influence your choice of park activities?

27.How much does your environmental knowledge (e.g., understanding and awareness of nature conservation) influence your choice of park activities?

28.How much does companionship (e.g., visiting the park alone, with friends, or with family) influence your choice of park activities?

29.How much does the impact of COVID-19 or other epidemics (e.g., preference for outdoor activities due to health concerns) influence your choice of park activities?

Part 5: Open-Ended Question

30.Do you have any other suggestions or thoughts about nature-based recreation activities in urban parks?

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Heterogeneity and Trade Dispute: Comparing U.S.-Japan Trade Friction and U.S.-China Trade and Technological Rivalry

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Abstract

This study conducts a comparative analysis of two major trade conflicts-the U.S.-Japan trade friction of the 1980s and the current U.S.-China trade war- to explore the critical role of heterogeneity in shaping these conflicts. The study posits that heterogeneity cannot be assimilated or eliminated because countries, as countries like China and Japan inherently develop models different from that of the United States. Moreover, heterogeneity is closely related to state power; when power levels between states converge, heterogeneity is often seen as a potential threat. However, this study also points out that similarities in political institutions and ideologies can help mitigate the scope and intensity of conflicts. In the case of the U.S.-Japan dispute, most of the conflict has been contained between the two countries through targeted bilateral negotiations and industry-specific agreements. In contrast, the -China economic game poses a more far-reaching challenge to the existing international order. While China's economic rise has followed certain similar path to Japan's, its unique political system and ideological differences have made the impact of this conflict more pronounced.

Keywords : U.S.-Japan trade friction, Sino-U.S. trade war, heterogeneity, trade friction, Rising power, Industry competition

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Introduction

The rise of China as a global power is one of the important events in modern world politics. It began with China's declaration of reform and opening-up in the 1980s, which China decided to join the economic liberal order. Over three decades, China has evolved from a peripheral developing country into a superpower engaging in near-peer competition with the United States. China's widespread and rapidly expanding trade and investment networks have established its political presence across all over the world. China's military power is increasingly asserting its influence in the regions surrounding China and beyond. The substantial resources China has invested in advanced technology also signify a comprehensive enhancement of China's strength. These developments collectively underscore a recurring theme throughout history: the shifting dynamics of power and the cyclical rise and decline of dominant powers.

In 2018, Trump announced a 30% tariff on solar panels, with China being the largest exporter. This action marked the beginning of the Sino-U.S. Trade War. As the trade war started, they were already numerous political commentators and publications advocated for a tougher stance against China, claiming an "end of engagement" (McCourt, 2022**)** and suggesting that confrontation and conflict had begun. Some scholars have even labeled this conflict the "New Cold War" (Kaplan, 2019). However, criticisms of China's practices—such as forced technology transfers, unfair trade practices leading to the United States's job losses, restrictions on foreign company access—have existed long before China's economic rise.

After the Second World War, Japan became the United States's closely allay and then had a quick development in economics. Japan was recognized as one of the Western camps, and a key player of the LIO. However, this perception shifted when economic competition between the United States and Japan intensified. Starting in 1982, Japan became the largest deficit trading partner of the United States. The growing trade deficit and indebtedness on the United States side sparked a debate about Japan's potential to economically overtake the United States.

Explanations emerged in the United States that Japan was different from the West, particularly in its deviation from free trade principles and market capitalism. New terms like 'developmental state' and 'comparative capitalism' were created to redefine Japan's economic model. In 1980s, despite the United States efforts through tariffs, negotiations, and various initiatives and frameworks, the trade deficit with Japan remained substantial, leading to questions about Japan's commitment to the liberal order. Those questions were attributable to fear and suspicion of the unparalleled speed of Japan's rise of power, and it even was believed to be promoting a 'Pax Nipponica', a neo-mercantilist order, in some scholar's thoughts (Vogel, 1986).

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Japan's economy came to be perceived as "different, closed, and threatening." A New York Times poll in 1990 found that the United States public considered Japan's economy a greater threat than the Soviet Union's military. (Lehner & Murry, 1990). Oyase (2022) addresses this phenomenon by proposing a heterogeneous perspective. He argues that the proximity and transition of power can easily give rise to a trend of emerging market countries being perceived as heterogeneous. It leads to further intensification of the antagonism of economic and trade friction. In US-China relations today, both the economic and security realms are areas of frictions, which makes the current overall tendency among the United States government agencies to securities China even more problematic.

The trade friction between Japan and the United States represents the most significant economic conflict between the United States and another country prior to the Sino-American trade war. Examining the Sino-U.S. trade conflict is important due to its distinct characteristics. Unlike the Japan-U.S. trade conflict, the Sino-American trade conflict is compounded by the fact that the United States are not allies, introducing more complex ideological and competitive factors. This paper seeks to address the underlying causes of this conflict. Departing from traditional realist theories such as balance of power and power transition theory, this study emphasizes the role of heterogeneity. It posits that heterogeneity becomes politicized as power converges. By comparing the differing cases of China and Japan, the paper argues that the degree of heterogeneity significantly influences the scale of conflict. This is evident in the varying global impacts of the China and Japanese cases.

Japan's Integration and the Question of "Otherness"

Japan's post-World War II transformation is often perceived as a "Western" liberation from its "feudal and militarized past" through allied occupation. The country's accession to the General Agreement on Tariffs and Trade (GATT) in 1955 was widely regarded as a symbol of Japan's "re-entry into the international community" (Morris, 2010). Japan's success was largely attributed to its "Westernization," leading to the perception that it had become "more like us" (Morris, 2010).

However, trade frictions in the 1980s prompted a reevaluation of Japan's integration. The discourse shifted to emphasize Japan's "otherness," questioning whether it had truly embraced the liberal economic order. this shift in perception foreshadowed later debates about China. The central question became whether maintaining the "free trade" approach would ultimately transform Japan or if this strategy had reached its limits. Gilpin (1989) observed, "Japan's uniqueness has increased the difficulty of integrating this dynamic and important nation into the larger economic system," highlighting the challenges of reconciling Japan's economic practices with the prevailing liberal economic.

The case of Japan serves as a critical precursor to contemporary debates about China's integration into the global economy. The ascendancy of China presents a more complex ideological challenge to the existing international order than previous economic competitors. Unlike Japan's post-war alignment with the United States norms, China's political system and economic model diverge significantly from Western liberal democracies, introducing additional layers of tensions to trade relations.

China and Intensified Perceptions of Heterogeneity

China's integration into the global economy, marked by its entry into the WTO and its rapid ascent to become the world's second-largest economy, has created some challenges for the world. Firstly, the influx of cheap Chinese imports has been linked to job losses and wage stagnation for factory workers in Western countries. Secondly, Accusations of China subverting the LIO from within, particularly through forced technological transfer, and industry subsidiary have gained prominence. These concerns have led to criticism of the decision of admit China into the WTO

China's economic governance model, characterized by significant state-oriented, shows lots of differences from LIO members. Especially China's interventionist industrial policies have become a greater concern. China is shifting from being the "world's assembly foundation" to aspiring to become a hub for high technology, as outline in its "Made in China 2025" policy. This initiative aims to achieve self-sufficiency in advanced industries such as robotics, artificial intelligence, electric vehicles, and aerospace through massive state funding and state-driven foreign direct investment. At the same time, China is implementing vast projects of regional integration, such as Asian Infrastructure Investment Bank, and Belt and Road Initiative.

China's initiatives are viewed by some scholars as efforts to assert influence and promote alternative models of international governance. The construction of China as the "other" reflects a heightened emphasis on heterogeneity. The United States perceives China's rise as not only an economic threat but also an ideological challenge to the liberal underpinning the LIO. This perception intensifies trade conflicts and complicates efforts toward integration.

Rising power countries, in their pursuit to effectively catch up with dominant powers, tend to adopt ideologies and policies that differ from those of dominant powers. Rather than relying on spontaneous activities of private actors, these emerging markets are inclined to implement government-led approaches that guide and support economical sector activities to achieve industrial development. Both Japan's industry development and China's export-oriented economic growth model have employed similar government-led development strategies. From this perspective, China and Japan share more commonalities with each other than with the United States.

The United States' perception of China and Japan as heterogeneous extends beyond mere differences in political systems. It encompasses a broader view of their political-economic systems as different, including industrial policies and government-business relationships. In other words, as the national power of rising states approaches that of the hegemon, the existing hegemonic power tends to emphasize the heterogeneity of the rising state while downplaying their similarities. This perception helps garner domestic support for more aggressively trade policies against the rising power, further intensifying frictions and conflicts. The tendency to emphasize heterogeneity in rising powers can be observed in both the U.S.-Japan economic frictions

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of the 1980s and the current U.S.-China trade tensions. In both cases, the United States has highlighted the "otherness" of its economic competitors, often framing their economic models as incompatible with LIO.

In the follow sections, this framework will be applied to analyze the resolution of U.S.-Japan economic frictions, providing insights into how perceptions of heterogeneity influenced negotiation processes and outcomes.

The Japan-US trade Friction

The process of the Japan-U.S. trade friction is categorized into three phases. (1) the 1950s to the late-1970s, (2) the late-1970s to the mid-1980s, and (3) the mid 1980s to the mid-1990s. While these conflicts occurred in stages, they also exhibited interconnected characteristics across the different periods.

Phase one: Voluntary Export Restraint-Based Friction

The period from 1950s to the 1970s marked the early stages of Japan-U.S. trade disputes. The Japan-U.S. auto trade friction from 1979 to 1981 exemplified the characteristics of the first phase of Japan-US trade disputes. In the 1970s, the automotive industry was regarded as a symbol of American economic prosperity, providing over 1.1 million employment opportunities in 1979 (Singleton, 1992). The second oil crisis in 1979 led to increased gasoline prices, shifting American consumers preferences towards fuel-efficient and affordable Japanese compact cars. This shift led to a rapid increase in Japanese auto exports to the United States, posing a great challenges to domestic American automakers.

In 1980, the United Auto Workers (UAW) began lobbying the United States Congress, government, and even the Japan Automobile Manufacturers Association and Japanese government to restrict Japanese exports to the United States and ensure Japanese manufacturers established plants in American to safeguard the United States employment (Feenstra, 1984). In June of the same year, the UAW filed a petition with the United States International Trade Commission under section 201 of the United States Trade Act, seeking import restrictions on Japanese vehicles. However, the ITC did not find Japanese auto exports had caused substantial harm to the United States industry, based on free trade principles, the ITC recommended continuing Japanese auto imports without any restrictions. However, the ITC's decision was insufficient to resolve the auto trade friction between the United States and Japan.

In March 1981, Japanese Foreign Minister Masayoshi Ito visited the United States. During his meeting with President Regan, he was informed of the United States government's desire for Japan to implement VER. Despite opposition from Japan's auto industry, there was internal support within the Japanese government for compromise through VER. The Ministry of Foreign Affairs advocated from the perspective of maintaining stable Japan-U.S. relations. Concurrently, the Ministry of International Trade and Industry (MITI) recognized the necessity of considering the economic interdependence between the two countries. Ultimately, the Japanese government agreed to the compromise. In May 1981, Japan and the United States reached a consensus to reduce Japanese auto exports to the United States to 1.68 million units annually. This agreement finally resolved auto trade friction between the two nations.

This auto trade friction reflected the characteristics of the first phase of U.S.-Japan trade frictions. The issue originated from domestic the United States industries and labor unions demanding action from Congress and the government. The lawsuit based on Section 201 of the Trade Act catalyzed widespread domestic attention and congressional action. According to the United States constitution, the authority to manage international trade belongs to Congress, compelling the government to address congressional demands for protecting domestic enterprises.

In summary, the first phase of Japan-U.S. trade friction was characterized more by the interplay of various factions within both governments and industries rather than a confrontation. During this phase, Japan was not viewed as an "other." The Regan administration exhibited numerous reservations about trade restriction measures. In the end, rather than imposing formal punitive tariffs on Japan, they negotiated to persuade Japan to agree to VER, containing the dispute within a manageable scope successfully.

Phase Two: Voluntary Import Expansion-based Trade Friction

From the late 1970s to the mid-1980s, Japan-U.S. relations grew increasingly tense. The semiconductor trade friction emerged as a paradigmatic case of this period, with causes similar to the earlier automobile trade disputes. The root of this conflict lay in the significant growth of Japanese semiconductor exports to the United States. In the late 1970s, Japanese semiconductors had begun to flood the United States market. Despite bilateral negotiations resulting in VERs, this measure failed to effectively improve the operational environment for American semiconductors firms. As the 1980s progressed, Japanese semiconductor products continued to expand their market share in the United States, while Japan's low import volume from the United States emerged as a new problem.

Japan began to emerge as a significant producer of semiconductors in the late 1970s, particularly in Dynamic Random Access Memory (DRAM). During the 1980s Japan had gained a dominant position in DRAM technology, monopolizing the market with more than 75% of global market share (Noyce & Wolff, 1986). This dramatic shift prompted a strategic response from The U.S. semiconductor manufacturers, leading to the formation of the Semiconductor Industry Association (SIA) in 1977.

The SIA's initial concerns focused on Japan's industrial policies and market access barriers. Despite the United States semiconductor industry's global market share exceeding 50%, its penetration of the Japanese market remained limited to 10% (SIA, 1983). The 1984 global semiconductor recession exacerbated tensions, prompting the SIA to file a Section 301 petition against Japan in 1985. This action led to bilateral negotiations, culminating in the 1986 U.S.-Japan Semiconductor Agreement.

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This agreement addressed three key areas: price monitoring of Japanese exports, prevention of third-country dumping, and opening of the Japanese market to foreign semiconductors. Notably, it included a controversial "secret clause" targeting a 20% market share for foreign semiconductors in Japan (Prestowitz, 1989).

The Japan-U.S. semiconductor friction escalated after the signing of the agreement. In April 1987, the United States government accused Japan of violating the 1986 Agreement, claiming multiple violations including inadequate regulation of semiconductor dumping in the United States market via third-party countries and insufficient promotion and marketing of the United States semiconductor products within Japan. In response to these perceived breaches, the United States Trade Representative (USTR) took unprecedented action. Invoking Section of 301 of the Trade Act of 1974, the USTR imposed $300 million in punitive tariffs on a range of Japanese electronics exports, including computers and colour televisions. This action represented a significant escalation in trade tensions and marked a historic moment in post-World War II economic relations between Japan and the United States, it was the first instance of Japan facing economic sanctions from the United States since the war.

The impact of these agreements on Japan's semiconductor has been the subject of considerable controversy. A central element of the semiconductor agreement involved the Japanese government agreeing to set quotas on the export of DRAM chips. However, the restrictions on the sale of DRAM chips to the United States led to increased prices for these chips in all regions outside of Japan. Japanese DRAM producers benefited from these higher prices (Savary et al., 1990). Contrary to the agreements' intentions of bolstering the United States semiconductor industry, particularly in the memory chip sector, the outcomes were mixed. Most the United States semiconductor manufactures chose to exit the memory chip market, allowing Japanese companies to maintain their dominant position in the global memory chip market. Trade agreement failed in saving the United States memory chip industry.

The resurgence of the United States semiconductor industry was primarily driven by strategic shifts toward research and development (R&D) and the outsourcing of production. Silicon Valley maintained trade relations with Japan while simultaneously diversifying its production base, outsourcing chip production to emerging semiconductor hubs in Taiwan and South Korea. the United States semiconductor firms moved away from capital-intensive manufacturing processes, focusing instead on chip R&D to regain their competitive edge. For example, Micron successfully challenged Japan's dominance in the memory chip sector through technological advancement and cost reduction strategies. Today, Micron is one of the leading DRAM chip manufacturers in the world. The industry's landscape was further transformed by the rise of personal computers and the growing demand for microprocessors. The United States companies capitalized on this trend more effectively than Japanese counterparts, who failed to adapt to the rapidly evolving PC market. By 1993, the United States regained its leadership with a 43% share of the global semiconductor market (Kanz, 1994).

The second phase of U.S.-Japan trade friction was characterized by the emergence of an unprecedented trade management approach that involved setting specific numerical targets for the market share in Japan's domestic market. This approach, known as voluntary import expansion (VIE), potentially conflicted with free trade principles and raised concerns about its compatibility with the principles of the LIO.

As Japan's economic power further approached that of the United States, concerns about Japan's economic practices began to emerge. The United States trade deficit expanded after 1981, with the deficit with Japan reaching a record high of $58.6billion in 1986. This growing trade imbalance led to a perception in the United States that invisible, hidden barriers within Japan's economy were obstructing the United States exports to Japan. These trade deficits growing concerns within the United States policy circles, particularly in congress. In March 1985, the Senate passed a resolution declaring that the trade imbalance with Japan had resulted in the loss of hundreds of thousands of jobs in the United States, while Japan enjoyed extensive access to the US market, US exporters lacked equivalent access to the Japanese market.

This shift in trade policy and perception marks a critical juncture in U.S.-Japan economic relations. It reflects the growing tensions between maintaining the principles of free trade within the LIO framework and addressing perceived inequities in bilateral economic relationships. The implementation of VIEs and the focus on numerical targets for market share represent an attempt to manage trade imbalances through more direct interventions, challenging traditional approaches to trade liberalization.

Phase Three: Economic Structure Reform-Related Trade Conflicts

In the late 1980s, the concept of Japan's 'otherness' became prevalent in the United States (Morris, 2013). This narrative characterized Japan's political and economic system as fundamentally different from Western norms. Against the backdrop of the growing the United States trade deficit with Japan, the United States Congress passed the Omnibus Foreign Trade and Competitiveness Act of 1988. This legislation included the Super 301 provision, mandating the USTR to annually investigate unfair trade practices abroad, designate priority targets, and eliminate these practices through negotiations within a year, or impose sanctions if necessary.

Super 301 was used to impose sanctions in three areas: satellites, supercomputers, and wood products sectors. Japan responded not only by continuing VIE measures but also by undertaking institutional reforms (Puckeet & Reynolds, 1996). In June 1990, Japan announced Structural Impediments Initiative (SII) with the United States, encompassing six main area with approximately 240 specific items, including land use policy, public expenditure, and amendments to distribution system laws. Many of these negotiation points can be seen as interfering with Japan's domestic affairs (Matsushita, 1990).

Within the Japanese government, the semiconductor trade disputes negotiations were regarded as negative precedent, leading to strong resistance against setting specific numerical targets in agreements. However, The United States government maintained that while not mandating obligatory numerical standards, setting related figures was necessary to effectively

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promote the opening of the Japanese market. Moreover, the United States also argued that setting these targets did not violate GATT principles; rather, it was Japan's market closure that undermined the open trade principle by GATT (Lincoln, 2000).

Japan-U.S. trade negotiations during this period experienced multiple breakdowns and interruptions. The collapse of automotive sector talks in 1994 led the United States to threaten sanctions under Section 301 and contemplate filing a complaint with the newly established World Trade Organization (WTO) regarding Japan's market closure. Uncharacteristically, the Japanese government responded by filing a counter-complaint with the WTO against the United States sanctions. Although the Japanese refused to set specific numerical targets, major Japanese automotive companies still developed plans to increase purchases of the United States -made auto parts, indicating a certain degree of concession (Pollack, 1995).

In the third phase, as the economic power gap between the two nations narrowed, the United States political circles became increasingly wary of Japan, while Japan also exhibited a stronger stance of resistance. During this stage, the friction extended beyond trade issues, with divergent interpretations of free trade rules further exacerbating tensions. The dispute between the United States and Japan over setting numerical targets versus the principles of free trade reflected a conflict at the ideological level, resulting in sharp confrontation.

Under such intense friction, if the situation had continued to develop, the bilateral relationship might have deteriorated significantly. However, by the late 1990s. with the established of the WTO, countries gradually began to resolve trade disputes through the WTO's legal mechanism, and U.S.-Japan economic and trade relations began to stabilize. Additionally, with the collapse of Japan's bubble economy and its declining international competitiveness, the economic and trade frictions between Japan and the United States gradually came to an end.

Divergent Paths: Perceptions of Heterogeneity in U.S.-China Relations

The United States perception of China as "heterogeneous" has undergone several transformations over the past decades, reflecting changes in China's global position.

In the 1970s, amid Cold War tensions, China was viewed as a potential strategic allay against the Soviet Union (Kissinger, 2012). During this period, the "otherness" of China was perceived as malleable, with the United States policymakers harbouring expectations that economic engagement would catalyse political liberalization. This perspective persisted into the 1980s and 1990s, despite growing concerns over human right issues. The Clinton administration's support for China's accession to the WTO in 2001. At this period, the United States believes that deeper integration would accelerate China's assimilation into the LIO (Ikenberry, 2008).

As China's economic prowess burgeoned in the early 21st century, The U.S. perceptions shifted, China began to be viewed increasingly as an economic competitor. The "otherness" of China's economic model, particularly state involvement in the economy, became a point of contentions. This period marked a transition in how the United States conceptualized China's "otherness," moving from a focus on potential convergence to an emphasis on system differences (Friedberg, 2005).

Post-2016, the perception has further evolved, with China now being view as a strategic rival. The notion of China as fundamentally "other" has expanded beyond economic considerations to encompass political systems, approaches to international institutions, and global dominant ambitions (Foot & King, 2019).

The core dynamic in U.S.-China relations vis-à-vis heterogeneity lies in the persistent acknowledgement of China's distinctiveness, coupled with evolving the United States beliefs about the possibility and desirability of transformation. Initially, there was optimism that China's heterogeneous elements could be transformed through engagement and integration into the global economy. However, as China's economic strength grew, this optimism gave way to concern, with China being perceived as a formidable economic competitor-a position Japan once occupied in the United States strategic thinking.

Turing Point Periods in China-U.S. Relations

The current U.S.-China relationship has entered an unprecedented phase. This new stage is distinct from previous periods of economic rivalry, such as that with Japan, due to China's unique position within the LIO framework and its capacity to challenge fundamental aspects of the existing global order.

Before the outbreak of the U.S.-China trade war, American scholars were already debating whether the United States strategy toward China had been a comprehensive failure. Some scholars believe that Sino-American relations have entered a critical turning point, with China's rise posing an unprecedented challenge to the United States national interests (Blackwill & Tellis, 2015). In terms of policy toward China, the American academic and policy communities can be broadly categorized into three factions.

The first faction can be termed the "New Cold War" faction. This group argues that U.S.-China competition is a zero-sum game, and that the two countries have entered a "New Cold War" era. Is necessary for United States to take a more assertive strategy toward China (Friedberg, 2018). While drawing parallels with the U.S.-Soviet rivalry, proponents of this view acknowledge key differences in the current geopolitical landscape. Form Truman to Regan, American foreign policy focused on "containment" of the Soviet Union, advocates of the "New Cold War" approach argue for a similar prioritization of China as the primary strategic challenge for the United States. Matt Pottinger (2024), who served as Deputy National Security Advisor during the Trump administration, argued in Foreign Affairs that "America's competition with China must be won, not managed. "He advocates for emulating Regan's approach to the Soviet threat, suggesting that countering China should be prioritized as America's foremost task.

The second school of thought can be described as "Competitive Coexistence" perspective. Unlike the first group's advocacy for total confrontation, this faction believes that U.S.-China competition is not purely a zero-sum game, and that it is crucial to develop a strategy for coexistence with China. Campbell and Sullivan (2019) argue that competition with China should be

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viewed as a condition to be managed rather than a problem to be solved. This perspective advocates for a US policy toward that also prioritizes competition, while maintaining necessary cooperation. It seeks a middle ground between the extremes of complete decoupling and unrestricted engagement (Schell & Shirk, 2022).

The third can be referred to as the "Cooperation" faction. While this group shares concerns about China's political system and its growing global influence, they are more focused on the risks of U.S.-China competition escalating into more intense confrontation (Pepinsky & Weiss, 2021). This perspective advocates for a more nuanced and less confrontational approach to U.S.-China relations, emphasizing the need for engagement and cooperation on less controversial issues. Expanding on this perspective, Weiss (2021) suggests that the United States should present China with genuine choices, combining deterrence with assurances and engaging in direct about coexistence. This could include strengthening deterrence while clarifying the US "One China" policy and investing in inclusive global initiatives that do not exclude China. Moreover, this faction emphasizes the importance of understanding China's strategic concerns and avoiding policies that might push China towards more aggressive behavior.

The spectrum of policy prescriptions, from confrontational to cooperative, illustrates the ongoing debate with American policy circles about how best to manage the rise of China. Each approach carries its own set of potential benefits and risks. The "New Cold War" perspective emphasis deterrence and competition but risks escalating tensions. The "Competition Coexistence" view seeks a balance between competition and cooperation but may struggle to navigate the inherent tensions in such dual-track approach. The "Cooperation" thought emphasizes engagement and mutual interests but could underestimate the challenges posed by ideological and system differences.

It is crucial to note that these three schools of thought do not exist in a linear chronological progression but rather coexist within American academic and policy spheres. Their influence on government policy has varied with different administrations. The Trump era, for instance, was characterized by a "New Cold War" approach, while the Biden administration has leaned more towards "Competitive Coexistence." Despite their divergent views on specific policy approaches, all three factions agree that China poses a significant challenge to the United States and its leadership of the LIO.

From Trump to Biden

The diversity of China policy perspectives reflects the multifaceted nature of US-China relations, deeply influenced by perceptions of heterogeneity between the two nations. When Trump took office in 2017, his primary concern regarding China was the large THE UNITED STATES trade deficit. The Trump administration not only labeled China as a "revisionist power" and "strategic competitor" but also viewed the Chinese Communist Party as a threat to the "free world". (Mcfaul,2020). This characterization underscores the perceived ideological and system differences-key aspects of heterogeneity-that the administration believed posed changed to the United States interests.

The Trump administration adopted a comprehensive confrontational approach, engaging in competition and opposition with China across almost all issues. Economic and trade issues were at the forefront. The Trump administration imposed punitive tariffs on a wide range of Chinese export good. Subsequently, they expanded their actions by enhanced scrutiny and restrictions on Chinese investments, tightening export controls on high-tech products to China, and Implementing sanction on Chinese companies in critical technology sectors, such as Huawei and ZTE in telecommunications.

Perceptions of heterogeneity played a significant played a significant role in shaping these policies. The United States viewed China's state-led economic model, differing political system, and alternative approach to international norms as fundamentally incompatible with the LIO. This perception intensified fears that China's rise would undermine the United States global leadership and the values it promotes. By emphasizing the differences between the two nations, the Trump administration justified unilateral actions aimed at countering what it saw as unfair practices rooted in systemic heterogeneity.

Despite the confrontational rhetoric and punitive measures, the Trump administration's approach maintained a degree of flexibility. While implementing tariffs, the administration remained open to trade negotiations and demonstrated some willingness to compromise on technological competition issues (Kubo, 2019). For instance, even after announcing sanctions on Huawei, the administration delayed their implementation several times, suggesting a more nuanced approach than initially perceived.

Trump's "America First" policy resulted in Washington pursuing its China strategy largely in isolation, without coordinating efforts with other nations. Consequently, the administration failed in building a strong multilateral group to counterbalance China (Christensen, 2021). This unilateral approach underscores the emphasis on bilateral differences and the perceived inability to reconcile systemic heterogeneity through existing international frameworks. Some scholars argue that Trump's primary focus was on advancing the United States commercial interests, with an inclination toward negotiating deals with China rather than engaging in a comprehensive confrontation (Weiss, 2022). In November 2017, Trump made a state visit to China, a gesture that underscored his administration's willingness to engage diplomatically. In January 2020, two countries signed the Phase one trade agreement, aimed at addressing economic and trade disputes. Despite its overall hawkish stance towards China, the Trump administration maintained some flexibility in negotiating with China.

However, the outbreak of Covid-19 in 2020 altered the temporarily calm bilateral relationship. Trump blamed China for the global pandemic, further emphasizing the perceived heterogeneity by attributing the crisis to systemic shortcomings in China's governance. He suspended most bilateral dialogues, and adopted a hostile stance (Griffiths, 2020). At the same time, the pandemic's disruption of global supply chains forced the United States to rely heavily on imports from China. By the end of Trump's term, some analysts argue that his trade war with China had been unsuccessful in achieving its primary objectives (Bown, 2021).

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The Biden administration's China policy exhibits clear continuity with its predecessor, yet it also reflects a strategic shift in addressing heterogeneity. Biden has consolidated the confrontational orientation of Trump-era policies towards China, framing his strategy as "invest, align, and compete" (The White House, 2021). In his first foreign policy address in 2021, Biden referred to China as America's "most serious competitor" and pledged to directly address the challenges China poses to the United States prosperity, security, and democratic values.

Unlike Trump, Biden places greater emphasis on the importance of alliances and international organizations in shaping foreign policy and advancing technological. By aligning with other democracies, the administration seeks to create a unified front that can better manage the challenges arising from heterogeneity with China. The Biden administration also worked closely with Congress to launch large-scale infrastructure investments and industrial policies aimed at enhancing The United States competitiveness and reducing reliance on China. In August 2022, Biden signed an Executive Order to implement the Chips and Sciences Act, which is designed to strengthen chip manufacturing in the US and address supply chain issues (The White House, 2022).

To better compete with China in advanced technology sectors, the administration imposed stricter export controls on the semiconductor sector. Additionally, it fostered international cooperation by establishing the "Chip 4" alliance—a semiconductor partnership among Japan, South Korea, Taiwan, and the United States. The Biden administration has made technological competition a central element of its China policy, framing it within a binary context of "techno-democracies" versus "techno-autocracies" (Bradford, 2023). Furthermore, the Biden administration has successfully united traditional allies to counterbalance China, leading to a cohesive alliance of nations with shared values and objectives.

US-China Chip War

The semiconductor conflict between the United States and China has emerged as a prominent issue within the broader context of US-China trade war. This conflict has demonstrated remarkable longevity, spanning both the Trump and Biden administrations. The scope of the conflict has progressively expanded, evolving from initial trade frictions to technological restrictions. Under the Biden administration, the conflict has further incorporated elements of ideology competition.

The semiconductor industry's role in everything from consumer electronics to advanced military system make it crucial in the context of great power competition (Miller, 2022). The United States strategies include direct sanctions, export controls, and diplomatic efforts to influence alliance, all aimed at hindering China's semiconductor technological progress. However, these policies have sparked debate over their effectiveness and long-term consequences. Critics posits that these measures might inadvertently spur domestic innovation in China, potentially leading to a more sufficient and competitive Chinese semiconductor industry.

Furthermore, concerns have been raised about the implication of these policies on the United States semiconductor companies themselves and global supply chains (GSCs). The highly interconnected nature of the global semiconductor industry means that disruption can have unintended consequences. The United States firms, also embedded in these global networks, may face challenges in terms of market access, revenue streams and collaborative research and development opportunities. While this restriction may slow China's progress in the short term, the long-term consequences for global semiconductor development, and geopolitical stability are yet to be fully understood. As Farrell and Newman (2019) contend, weaponized interdependence in high-tech sectors may lead to a reconfiguration of global economic networks, with potentially destabilizing effects on the international order.

Analysing Heterogeneity in U.S.-China Policy Shifts

The emphasis on heterogeneity-the recognition of fundamental differences in political systems, economic models, and ideological values—has been a driving force behind the shifts in THE UNITED STATES policy from Trump to Biden. Both administrations have grappled with how to engage a rising China that does not fully integrated into LIO.

Under Trump, the heterogeneity between the U.S. and China was highlighted to justify unilateral and punitive measures. The administration framed China not just as an economic competitor but as a "threat" to the world (Rappeport, 2019). This framing allowed for aggressive policies aimed at decoupling and containment, grounded in the belief tat the differences were too vast from coexistence within the LIO.

Biden's approach, while still acknowledge the heterogeneity, shifts towards managing these differences through strategic competition and alliance-building. By investing domestically and aligning with other democracies, the administration seeks to strengthen the collective capacity to compete with China. Moreover, the Biden administration's policies suggest an attempt to mitigate the negative effects of heterogeneity by creating structures and partnerships than can bridge some gaps. Initiatives like the "Chip 4" alliance represent efforts to consolidate technological ecosystem among like-minded nations, thereby reducing reliance on China and insulating critical industries from the different regions. The emphasis on heterogeneity in the Biden era serves both as a rationale for strengthening internal capabilities and alliances, and as a barrier to connection with China.

In both administrations, the recognition of heterogeneity has led to policies that seek to preserve the United States interests and values in the face of a rising power with a different system. The challenge remains in finding a balance between competition and cooperation, acknowledging differences without allowing them to escalate into open conflict. The United States changing approach reflects an ongoing struggle to adapt to a multipolar world where heterogeneity is the norm rather than the exception.

Evolving Trade Tension: From Japan to China

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In the 1980s, Japan's economy experienced rapid growth, with its GDO reaching 67.47% of the United States GDP in 1995, marking a historical peak. Similarly, China's economic expansion following its accession to the WTO has been remarkable. By 2022, China's GDP had reached 74.35% of the United States GDP, making China the third country since World War II to approach economic parity with the United States. Following the outbreak of the U.S.-China trade war, many scholars have compared it to the U.S.-Japan trade frictions of the 20th century, seeking potential strategies for addressing current challenges. There are indeed similarities between these trade conflicts, and it could be even argued that they share intrinsic connections.

The rise of China in the early 2000s partially redirected the United States attention from Japan's economic issues. After Joining the WTO, China quickly became the primary source of the United States trade deficit and surpassed Japan in 2010 to become the world's second-largest economy. The 21st century has seen that the United States grappling with a substantial trade deficit with China, while its manufacturing sector has been impacted by the influx of Chinese goods, echoing the circumstances of U.S.-Japan trade frictions in the 1980s. Furthermore, after Trump took office, he adopted policies similar to those from the Reagan era, initiating a Section 301 investigation against China and imposing tariffs, which were widely used during the U.S.-Japan trade frictions.

A critical focal point in these trade frictions has been the debate surrounding government-led development framework. The United States frequently leverages these issues as a basis for accusations of information leakage, forced technology transfer, and industrial espionage. This pattern of dispute is not unique to contemporary U.S.-China relations but was also evident in historical U.S.-Japan trade frictions. These arguments are underpinned by a perception of "heterogeneity". From this perspective, the political and economic systems of China and Japan are viewed as significantly divergent from Western norms. This notion of "heterogeneity" extends beyond economic and trade domains, permeating aspects of political systems, cultural values, and other aspects.

Japan was frequently characterized as "Japan Inc.," a term denoting its alliance of Japan's government bureaucrats and corporations established and implemented unfair trade policies. This qualitative analysis emerged as early as the 1980s. at that time, The prevailing narrative emphasized that Japan adhered to a set of economic rules distinct from those of the West, asserting that its economic planning and operational methods fundamentally differed from Western nations. In analyzing the dynamics of U.S.-Japan economic competition, a prominent argument focused on Japan's alleged "unfair" practices. This perspective posited that Japan's "unfairness" was deeply rooted in its unique cultural and social structures. Scholars such as Prestowitz attempted to construct chains of equivalence by essentializing Japan's differences (1989). This discourse implied that Japan's characteristic was so deeply ingrained that they were immutable and thus "impossible to address."

As Japan's economic power continued to grow, the United States perception of Japan underwent significant changes. Japan's position in the American consciousness progressed from an initial competitor to a major economic rival, and by 1989, it was viewed as the second-largest industrial nation and a technological superpower. Eventually, Japan was recognized as the world's most technologically advanced country (Cusumano, 1991). This shift in perception reflects the United States's ongoing attention to and assessment of Japan's rise. However, the conflicts between the United States and Japan were confined to the economic sphere. The United States did not exhibit deep concerns that Japan's rise might threaten its global order. in official narratives, Japan continued to be positioned as a crucial ally, and key partner.

China's economic rise follows a trajectory somewhat similar to Japan's development in the late 20th century. Both countries experienced intense trade frictions with the United States during their rapid development phases. The core points of contention often centered on the "heterogeneity" of their economic models, technological catch-up strategies, trade surpluses and market access issues, and the role of government in industrial development. Just as the United States once viewed Japan's economic model as "heterogeneous", China's state-led economy is similarly seen by the United States as divergent from the Western free-market economic model. The United States critical of China's "state capitalism" echoes its earlier skepticism towards Japan's "Japan Inc" model.

Nevertheless, the era in which China is rising, its geopolitical position, ideological characteristics, economic scale, and global influence create a fundamentally different international environment compared to that faced by Japan. These factors contribute to substantial differences in U.S.-China relations compared to historical U.S.-Japan relations.

Conclusion

The three patterns of U.S.-Japan trade friction—export dumping, weak imports, and domestic structural challenges—are all simultaneously present in the current U.S.-China trade friction. The U.S.-China trade war began with issues surrounding steel exports and the United States agricultural imports but quickly expanded to encompass matters such as technology transfer and market access. Moreover, the U.S.-China trade friction has escalated to include broader issues like the competition of international order and the establishment of new global framework.

In the U.S.-Japan trade disputes, the focus remained primarily on bilateral trade in goods and services and on Japan's market access issues. The emphasis was on reducing the trade deficit and diminishing barrier to Japan's market entry. Only in the later stages of these disputes did demands for reform of Japan's economic structure emerge. In contrast, as U.S.-China interactions intensified, the focus shifted from trade deficits to technological hegemony and geopolitical competition.

The semiconductor industry dispute particularly highlights the differences between these two periods. The United States sanctions on Japan's semiconductor industry primarily aimed to expand The United States market share in Japan and limit Japanese dumping in the United States market. Importantly, the United States did not view Japanese semiconductor products as a national security threat. However, in U.S.-China conflict, China's semiconductor industry has been defined by the United States as a strategic threat directly endangering national security.

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The response strategies of Japan and China to the United States pressure also differ significantly. In U.S.-Japan interactions, the U.S. often took the initiative, while Japan adopted a relatively passive stance, rarely implementing retaliatory measures. To maintain stable U.S.-Japan relations, Japan negotiated agreement with the United States through self-regulating policies like VER and VIE. This strategy effectively limited the trade friction's impact. Japan's strategic concessions afforded valuable time for its industrial development. China has taken a much tougher stance in the face of the United States pressure. China not only implemented retaliatory tariffs of equal scale but also placed the United States companies on a negative list. In the U.S.-China trade war, both the United States and China have demonstrated an unwillingness to back down.

During the U.S.-Japan trade frictions, the United States industry groups and labor unions frequently utilized legal mechanisms such as trade litigation laws to directly influence government trade policy formulation. In contrast, the U.S.-China trade friction has been driven by government initiatives rather than industry pressure. While the United States industry representatives have expressed their expectations and concerns regarding trade with China through internal governmental organizations, they have not issued urgent demands or resorted to legal measures. In fact, some industry groups have even voiced concerns to the government about the potential negative impact of the trade war on the United States industrial development. For instance, the SIA published a comment articulating concerns that the trade war could disrupt semiconductor supply chains, affect the industry's future development and undermine US technological leadership (SIA, 2021).

Overall, the U.S.-China trade frictions are more intense and multifaceted than those between the United States and Japan, involving deeper issues of technological supremacy and systemic rivalry. The heightened perception of China as a strategic competitor and the mutual unwillingness to concede have led to a more protracted and complex trade conflict.

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Research on Rural Grassroots Governance from the Perspective of Village BA

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Abstract

The remarkable popularity of "Village BA" presents to us not merely a rural - flavored sports event, but also a cultural phenomenon with modern elements that has been recognized by the masses. By delving deep into its folk culture, we can see that the "soft power" and "hard power" contained therein are important driving forces behind its transformation into a "phenomenal" event. Based on the field investigation of "Village BA", this paper analyzes the actual situation of rural governance and "Village BA", summarizes the crucial role of rural governance in its development, and proposes optimization paths. This aims to boost "Village BA" in the current trend of the times, enabling the sustainable and permanent rural governance to inject enduring vitality into sports culture.

Keywords : Village BA; grassroots democracy; rural governance; rural construction

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Introduction

The "commendation" by Zhao Lijian, a spokesperson for the Ministry of Foreign Affairs, contributed to the online popularity of the basketball game during the "New Rice Tasting Festival" in Guizhou. The term "Village BA" emerged out of nowhere, specifically referring to rural basketball games and the rural basketball culture centered around them. From the "Village BA" events, we can see that the abundance of material wealth promotes the construction of spiritual culture, which is inseparable from the influence of various social factors. Behind its accidental popularity lies the inevitable guarantee of rural governance.

Since the reform and opening up, the rural economy has witnessed rapid development. The traditional social structure and form of civilization have been impacted by foreign cultures. Improving rural governance to ensure the healthy development of society is the primary task of new rural construction [1]. "Village BA" is a basketball event led by the local government in Guizhou and voluntarily participated in by villagers. It is a "good recipe" that combines the connotation of sports culture with socialist construction.

The Actual Situation of Grassroots Governance in China

Grassroots governance serves as the cornerstone of national social governance at the rural community level and is a crucial guarantee for the construction of a new socialist countryside. In the basic governance framework, social organizations may assume roles such as integration, liaison, and intermediation, and are the core entities for enhancing governance effectiveness [12]. Since the 21st century, with the rapid development of the social economy and a significant improvement in the level of productive forces, grassroots governance has been greatly enhanced. A basic institutional framework and policy system have taken shape, the practice of villagers' self - governance has continued to deepen, and phased achievements have been made in governance levels and the improvement of the living environment, etc. [2].

At the same time, we should also note that although poverty alleviation and the reform of the rural collective property rights system have promoted the development of the rural collective economy, the weakness of the collective economy remains a common phenomenon. This is also an important reason for the weak appeal of village committees in grassroots governance and the reduced attractiveness of self - governance. The awareness of the main body and the degree of participation need to be improved, as some farmers have a weak sense of the main body in participating in governance and lack enthusiasm. The siphon effect of cities puts most rural areas at a disadvantage, leading to a brain drain in rural areas and thus weak grassroots governance capabilities. The boundaries of grassroots governance are blurred, and village organizations bear a heavy burden. Sometimes, the boundaries of responsibilities between government governance and mass self - governance are not clear enough, and village - level organizations undertake excessive administrative tasks, resulting in a heavy burden.

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The Correlation between Grassroots Governance and "Village BA"

The transformation of rural society has led to the diversified development of rural areas. The role played by rural governance in the transformation process is particularly important. There is a close relationship between "Village BA" and grassroots governance. In some areas, "Village BA" has even become an effective boost and vivid practice of grassroots governance. The correlations between them are reflected in the following aspects:

1. Promoting villagers' unity and enhancing cohesion: "Village BA" competitions usually organize teams to participate on a village - by - village basis. Villagers work together for the honor of their own villages. In this process, the team - work spirit and collective sense of honor among villagers are enhanced, promoting unity and cohesion among them.
2. Enriching rural cultural life: It provides villagers with a positive and healthy form of entertainment, enriches their spare - time life, promotes the cultural construction of the new countryside, and helps create a good rural cultural atmosphere [15].
3. Advancing grassroots self - governance: In the organization process of "Village BA" in some places, villagers independently negotiate and formulate competition rules, arrange the event process, etc., which reflects the spirit of villagers' self - governance and improves their ability of self - management and self - service.
4. Innovating grassroots governance methods: In some areas, the sports spirit is integrated with the concept of grassroots governance. By leveraging the influence and organizational form of "Village BA", some new grassroots governance methods and approaches are explored.
5. Strengthening communication and interaction: The competitions attract the participation and attention of numerous villagers, providing more opportunities for communication and interaction among them. This helps enhance the relationships between neighbors, resolve conflicts, and promote the harmonious stability of rural society.
6. Cultivating rural talents: Some villagers with basketball specialties stand out in the competitions and may become opinion leaders or activists in the village. Their influence and organizational abilities can play a role in other grassroots affairs.
7. Boosting economic development: The holding of "Village BA" attracts a large number of tourists, driving the development of local catering, accommodation, tourism and other related industries and the additional industrial chains. It promotes the prosperity of the rural economy, turning the "traffic" of the event into economic "stock", and then into development "increment", driving the growth of surrounding consumption.

"Village BA" and grassroots governance promote and complement each other. "Village BA" provides a new platform and carrier for grassroots governance, promoting the harmonious development of rural areas. And a good grassroots governance environment creates favorable conditions for the holding and development of "Village BA". This interactive relationship helps improve the level of rural governance and promote rural revitalization.

The Social Significance of the Construction and Development of "Village BA"

Rooted in rural areas, the games and atmosphere of "Village BA" fully embody the characteristics of folk sports culture. It is a vivid manifestation and innovative development of folk sports culture in contemporary society, with a close and profound connection between them.

"Village BA" Facilitates the Spread of Rural Culture

The fundamental reason for the popularity of "Village BA" lies in its "rural" nature. "Village BA" is closely linked to daily life, folk customs, and has a strong rural flavor, demonstrating unique cultural charm. Our preliminary investigation shows that rural basketball has been widely carried out, and there is a tradition of holding basketball games during folk festivals. In the process of integration and development over hundreds of years, it has gradually combined with local traditional folk customs, taking on a folk - like nature. Folk sports culture, rooted in the traditional rural society, features mass participation, emotional closeness, and a sense of competitive honor [3]. By exploring the roots of excellent traditional culture according to local conditions, it lays a cultural foundation for the development of rural sports. It provides a new way for the revitalization of rural culture, and rural sports represented by "Village BA" present a vibrant new look. With the help of modern technological elements and the momentum of the Internet, it breaks through local limitations, promotes the spiritual awakening of rural traditions, stimulates new vitality in modern rural areas, awakens distant rural traditions, and offers new ideas for the revitalization of rural culture. In rural cultural construction, it is necessary to fully investigate local characteristics, explore folk customs, form a multi - channel communication matrix, integrate the "rural flavor" with "modern elements", and create a distinctive rural culture.

"Village BA" Helps Improve Physical Fitness

"The Opinions of the Central Committee of the Communist Party of China and the State Council on Implementing the Rural Revitalization Strategy" points out that rural revitalization should "prosper rural culture and bring about a new look of rural civilization" [4]. The popularity of "Village BA" verifies the development of rural (sports) culture, demonstrates the great achievements of new rural construction, and takes "widely carrying out national fitness activities and improving the public service system for national fitness" as an important part of improving the physical fitness of the whole people [5], incorporating it into the comprehensive system of rural social governance. Folk sports culture such as "Village BA" is an important means to achieve "overall health". Firstly, "Village BA" has inspired villagers' enthusiasm for participating in sports. Driven by the games, more and more villagers actively engage in basketball, forming the habit of regular exercise. Secondly, basketball itself is a full - body exercise. It requires participants to have good endurance, speed, strength, agility, and coordination. In the atmosphere of "Village BA", villagers actively participate and constantly challenge their physical limits,

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effectively improving their cardiopulmonary function, enhancing muscle strength, and joint flexibility. Thirdly, "Village BA" usually has a wide range of participation, covering different ages and genders. This characteristic of mass participation gives various groups the opportunity to improve their physical fitness through basketball. Finally, the holding of "Village BA" also promotes the construction and improvement of surrounding fitness facilities, providing convenient conditions for villagers' daily exercise and further facilitating the improvement of physical fitness.

"Village BA" Contributes to the Improvement of Grassroots Governance

The popularity of "Village BA" cannot be achieved without the guarantee of rural governance, and at the same time, it has a positive impact on the improvement of rural governance. The correct guidance of village committees, the joint efforts of villagers, and the participation of all walks of life and other "pragmatic measures" have enabled the "Village BA" sports event to develop in a "phenomenal" way. Meanwhile, the popularity of "Village BA" has promoted the upgrading of relevant event services, the creation of the "Village BA" cultural IP, large - scale operation, etc., forming an integrated development of "agriculture, culture, tourism, and sports". Using the "event as a medium", it promotes the improvement of rural governance [6]. The "Village BA" event adheres to the principle of villagers' spontaneous organization, participation, and benefit. During the event, the opinions and suggestions of all villagers are fully solicited, and people's democracy throughout the whole process is implemented, promoting grassroots democracy and strengthening villagers' self - governance. At the same time, as a bridge and bond for villagers to maintain rural, friendly, and family feelings, "Village BA" can effectively gather the power of those who care about rural areas, agriculture, and farmers, enrich rural cultural life, promote the transformation of social traditions, and enhance the cohesion and sense of identity among villagers. Taipan Village in Guizhou Province adheres to the "Village BA" spirit of "villagers decide village affairs", implements the foundation of "one center, one network, and ten - household associations", actively promotes the "village - level courtyard meeting" to strengthen democratic consultation, and at the same time strengthens management through models such as "ten - household integration", "village regulations and people's agreements + village elders + democratic appraisal groups" [7], ensuring that grassroots democracy is implemented in all aspects and throughout the process of grassroots governance, and enhancing the endogenous driving force of grassroots governance.

Challenges Faced by Rural Grassroots Governance in the Context of "Village BA"

Although "Village BA" has brought many positive impacts on rural grassroots governance, there are still some challenges in rural grassroots governance from its perspective.

Insufficient Infrastructure Construction

Infrastructure such as sports venues, transportation, and communication is difficult to meet the needs of event and tourism development. In some areas where "Village BA" events are held, there may be transportation problems. For example, there are few vehicle schedules, a lack of shuttle buses, high ride - hailing fares, rugged roads, or inconvenient parking. The competition venues may also be relatively small, making it difficult to accommodate a large number of spectators. Moreover, the infrastructure is relatively backward, such as the lack of changing rooms, shower rooms, or problems like non - standard venues and imperfect safety facilities. In addition, local accommodation conditions may be limited, with issues such as a small number of hotels, poor management, high room rates, or long distances from the competition venues.

Shortage of Technical Talents

There is a lack of professional event organizers, managers, and operators, as well as various technical talents required for rural development. The shortage of technical talents can be reflected in many aspects. First, in terms of event organization and management, the lack of professional event planners, operators, and managers leads to an unsmooth event process and low organizational efficiency. Second, among the referee teams, the number of professional and experienced referees is insufficient, which may affect the fairness and standardization of the competition. Third, the scarcity of sports technical guidance talents makes it difficult for players to receive high - level technical guidance during training and competitions, thus affecting the improvement of the overall competitive level.

The shortage of "Village BA" technical talents is caused by multiple factors. On the one hand, the relatively backward economic development in rural areas makes it difficult to provide attractive salaries and development opportunities, resulting in the outflow of technical talents. On the other hand, the educational resources in rural areas are relatively weak, lacking training and education in sports event - related majors, making it difficult to cultivate local technical talents.

Sustainable Development Issues

How to avoid the short - lived popularity of "Village BA" and achieve its long - term and stable development is a key issue that needs attention. Apart from the shortage of infrastructure and technical talents discussed above, the development of "Village BA" also faces the following problems:

(1) Imbalance between Commercialization and Rural Characteristics: Excessive commercialization may cause it to lose its original rural flavor and purity. However, completely rejecting commercialization may lead to problems such as insufficient funds and difficulties in improving facilities, making it hard to achieve long - term development.

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(2) Homogenization of Events: With the expansion of the influence of "Village BA", other regions may follow suit, resulting in event homogenization. The lack of local characteristics and innovation may cause audience aesthetic fatigue and affect its sustainable development.

(3) Uneven Distribution and Sharing of Economic Benefits: How to reasonably distribute the economic benefits brought by the event among villagers, local enterprises, and other relevant parties to promote common development is a concern. Uneven distribution may affect the enthusiasm and investment of all parties [8].

Problems with the Interest Coordination Mechanism of "Village BA"

In the process of holding and operating "Village BA" events, the coordination of the interests of all parties is of crucial importance. However, there are currently some problems that affect the reasonable distribution of interests. First, the commercial operation of the event may cause some interests to tilt towards organizers or external investors, resulting in relatively less income for local participants such as villagers. This may trigger villagers' dissatisfaction and resistance, affecting the continuous holding of the event. Second, the economic benefits brought by the event may not fully benefit local enterprises and industries, leading to an uneven distribution of interests. This uneven distribution of interests may hinder the comprehensive development of the local economy and affect the long - term benefits of the event [14]. To solve these problems, it is necessary to establish a sound interest coordination mechanism to ensure that the economic benefits brought by the event can be fairly and reasonably distributed to all participants, promoting common development

Countermeasures and Suggestions for Optimizing Rural Grassroots Governance

Increase Investment in Infrastructure Construction

The government is the main body responsible for infrastructure construction. On one hand, it should actively strive for relevant project funds to provide stable financial support for infrastructure construction, which can be used to improve transportation conditions, expand and optimize competition venues, and increase accommodation facilities. On the other hand, it should carry out scientific and reasonable planning to guide infrastructure construction to achieve economies of scale. According to actual needs and development prospects, plan and build venues and surrounding facilities that better meet the requirements of events and audiences. Secondly, establish and improve relevant infrastructure management systems to ensure the effective management and maintenance of facilities. Strengthen the management of transportation, accommodation, etc., and improve service quality. Finally, improve land - use efficiency, revitalize existing land resources, and make rational use of land to provide more space for infrastructure construction.

Strengthen Talent Cultivation and Introduction

Solving the shortage of technical talents for "Village BA" requires the joint efforts of multiple parties. A sound talent cultivation and introduction mechanism should be gradually established to provide strong technical support for the sustainable development of "Village BA". It can cooperate with local schools and sports institutions to carry out relevant training courses and practical activities to cultivate local event organizers, referees, and technical guidance talents. Organize rural technical talents to communicate and learn from outstanding talents in cities or other regions [9] to improve their professional levels. By offering certain preferential policies and a good working environment, attract professional technical talents from cities to participate in the work of "Village BA" in rural areas. Through online training, remote guidance, etc., enable rural technical personnel to access more professional knowledge and experience.

Innovate the Development Model of "Village BA"

To achieve the sustainable development of "Village BA", the joint efforts of the government, villagers, and all sectors of society are needed. Based on maintaining its rural characteristics and the dominant position of villagers, rationally utilize resources, solve existing problems, and explore suitable development models. This includes innovating the event form by introducing themed events, online events, cross - regional exchange competitions [10], etc.; integrating with cultural tourism by creating "Village BA" tourism routes and building themed homestays for integrated development; expanding related industrial chains by promoting the combination of "Village BA" with special agricultural products, developing cultural and creative products to enhance popularity and added value; increasing the application of technology by building smart stadiums, carrying out intelligent transformations, and using high - definition live - streaming technology for event live - streaming and interaction to comprehensively improve the audience's viewing experience. These measures can further enhance the influence of "Village BA" and inject new vitality into rural revitalization.

Improve the Interest Coordination Mechanism of "Village BA"

Establishing a fair, reasonable, and effective interest coordination mechanism is an important way to realize the sustainable development of "Village BA". First, on the basis of guaranteeing the preferential rights and interests of farmers, establish clear interest - distribution rules [11], set up a special coordination agency to handle disputes in interest distribution, regularly publish the revenue and expenditure of the event, and strengthen information disclosure and transparency to ensure that all parties understand the basis and results of interest distribution. Second, it is necessary to conduct regular evaluations and adjustments to adapt to changing needs and promptly improve the three - dimensional distribution rules. At the same time, strengthen communication and cooperation among the government, enterprises, social organizations, etc., to form an interest

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community, jointly promote the development of "Village BA", and achieve a win - win situation. Third, strengthen the publicity and promotion of the interest coordination mechanism, improve the awareness and participation of all parties, and create a good atmosphere in which the whole society pays attention to and supports the development of "Village BA" [13].

Conclusion

As an innovative practice in rural grassroots governance, "Village BA" has brought new opportunities and vitality to rural development. With its strong cohesive force, "Village BA" has closely united rural people, stimulated villagers' sense of collective honor and belonging, injected new vitality into rural grassroots governance, and provided a new path for grassroots governance innovation. Through the hosting of "Village BA", rural communities have successfully established a platform integrating sports competitions, cultural exchanges, and community mobilization, effectively improving the effectiveness of grassroots governance and the participation of the public. It demonstrates the self - organizing and self - managing capabilities of rural people, highlighting the important role of grassroots democracy in rural governance. At the same time, "Village BA" has also brought new opportunities to rural economic development. By attracting tourists and promoting consumption, it has driven the revitalization of rural industries.

However, we should also recognize that rural grassroots governance is a complex and long - term systematic project, and "Village BA" is just one highlight among them. In future rural governance: First, we should encourage and support more rural communities to carry out sports activities similar to "Village BA". Through the guidance of sports culture, we can promote the innovation and development of grassroots governance. The government should increase investment in and construction of rural sports facilities to provide necessary hardware support for the development of sports activities such as "Village BA". Second, we should further give play to the positive role of innovative forms like "Village BA", constantly improve the rural governance system, and enhance governance capabilities. Third, we should strengthen the construction of grassroots Party organizations and give full play to the leading core role of Party organizations in rural governance. Fourth, we should strengthen the cultivation and introduction of rural sports talents to improve the organizational level and influence of rural sports activities. Increase investment in rural infrastructure and public services to improve the quality of life of rural residents. Also, we should pay attention to rural cultural construction, cultivate civilized rural customs, good family traditions, and simple folk customs to provide a solid cultural support for rural governance.

By giving full play to its positive role, addressing challenges, and continuously optimizing rural grassroots governance, we can realize the beautiful vision of a prosperous rural economy, a harmonious society, and a thriving culture, laying a solid foundation for the implementation of the rural revitalization strategy

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