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EDITORIAL

It is my proud privilege to welcome you all to The 2nd virtual International Conference on Social Science, Economic, Management and Tourism. I am happy to see the papers from different parts of the world and some of the best papers and abstracts published in this proceedings. This proceeding brings out important research ideas from diverse fields i.e. ethnolinguistics, higher education, media, SMEs, consumer behavior, E-commerce etc. UF-AALR is intended to provide a platform for researchers, educators and professionals to present their discoveries and innovative ideas and to explore future trends and applications in the field of Science and Social Science. However, this conference will also provide a forum for the dissemination of knowledge on both theoretical and applied research in the above-said areas with the ultimate aim of bridging the gap between these coherent disciplines of knowledge. Thus the forum accelerates the trend of development of scientific ideas for the next generation. Our goal is to make the Conference proceedings useful and interesting to audiences/readers involved in research in these areas, as well as to those involved in design, implementation and operation, to achieve the goal.

I once again give thanks to keynote speaker Professor Dr Shahid Bashir, the session chair and the advisory board members and other organizers from the United Frontiers Academy of Advance Learning and Research for successfully organizing this online-virtual conference. I am sure the contributions of the authors shall add value to the research community. I also thank all the reviewers for their constructive comments on the submitted abstracts and the follow-up of the revisions.

Editor-in-Chief

Dr Mushtaq Ahmad

United Frontiers Conference Proceedings

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Wiwitan Tradition in Guling Village, Pakunden, Ngluwar, Magelang: Ethnolinguistic Study

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ABSTRACT

This research provides a detailed exploration of the Wiwitan tradition, a ceremonial practice performed by farmers to initiate the rice harvest, analyzed from an ethnolinguistic perspective. Set in Guling Village, an agricultural community in Magelang, Central Java, the Wiwitan tradition remains a cornerstone of local cultural and spiritual life. Using a qualitative descriptive approach with an anthropological focus, this study draws on a comprehensive interview with Mbah Kaum, a respected elder who plays a central role in the ritual. Examining the ceremony through mystical, ontological, and functional lenses, the findings reveal the ritual's deep connection to the community's belief in supernatural forces, which are thought to influence the success of the harvest. The event, carefully organized by local leaders on selected dates, includes symbolic offerings to ensure the fertility of the rice fields. This research not only offers fresh insights into the Wiwitan tradition, highlighting overlooked aspects, but also contributes to broader discussions on how rituals sustain cultural identity and foster social cohesion in agricultural societies.

Keywords: Harvesting Tradition, Wiwitan, Cultural Ritual, Ethnolinguistics, Farmer

1. INTRODUCTION

Culture comes from Sanskrit, namely buddayah, the plural form of buddi (budia or reason), interpreted as things related to mind and human reason. Culture is the "mind" in the form of creation, charity, and taste, while culture results from creation, charity, and taste (Koentjaraningrat, 1979; Aslan &Yunaldi, 2018).

People develop, share, and pass on their culture from generation to generation. Many complex elements, such as religious and political systems, customs, language, tools, clothing, buildings, and works of art, make up culture. Culture is an overall pattern of life. Culture is complex, abstract, and vast. Culture is a complex that includes knowledge, beliefs, arts, morals, customs, and other abilities and habits that humans possess as part of society (Sumarto, 2019). Many aspects of culture determine communicative behaviour. These socio-cultural elements are diffuse and encompass many human activities. Cultural imagery provides a group of people with guidelines for behaviour and logical values that the most modest group can lend to gain a sense of dignity and connection to their lives. The human brain uses culture as software to guide perception, identify what it sees, focus on certain things, and avoid others (Sumarto, 2019).

Culture is a pattern of basic assumptions discovered and determined by a particular group due to the study and mastery of external adaptation and internal integration problems, which has worked well enough to be considered appropriately and therefore taught to new members as a way of perceiving, thinking and feeling correct about those problems (Aslan et al., 2020a; Aslan et al., 2020b; Aslan, 2019; Aslan, 2017; Aslan et al., 2019; Aslan & Yunaldi, 2018).

Javanese culture originates from Java and is embraced by Javanese people, especially in Central Java, Yogyakarta Special Region, and East Java. Central Java is one of the regions where people embrace Javanese culture, as it is recognized as a critical hub for preserving Javanese culture and traditions. Central Java encompasses a vast area with numerous regions where numerous cultures and traditions continue to be preserved, upheld, and practised for generations. Magelang is among the regions and villages that continue to uphold the cultural practices of their ancestors, including the practice of tradition.

A tradition or custom is a long-standing practice among a group, typically belonging to the same country, culture, period, or religion. The fundamental aspect of tradition is the transmission of written and oral information from one generation to the next, as the absence of this transmission can lead to the extinction of the tradition. Tradition can also be defined as transmitting information from the past to the present. Tradition, in the narrow sense, is a heritage—an exceptional social heritage that meets the requirements that survive in the present and remains firmly tied to the life of the present. Traditions that exist in society have a purpose, so human life is rich in culture and historical values.

Additionally, tradition contributes to the harmony of life. Humans can achieve this by correctly respecting and adhering to traditions and following the rules. Therefore, researchers will discuss the traditions in the Central Java Region, namely in Guling Village, Pakunden, Ngluwar, Magelang, and Central Java, about the harvest wiwitan tradition, which until now is still being carried out and developed in the village. Farmers make up most of the population, making Guling village one of the agricultural areas where housing should not be constructed.

The term "wiwitan" originates from the word "wiwit," which signifies the commencement of rice cutting before harvest. The Javanese people perform Wiwitan as a traditional offering ritual before the rice harvest. This Wiwitan tradition has existed since before religions entered Java. Entering the harvest season, many farmers in rural areas perform Wiwitan rituals. The mbahkaum, the village's oldest person, leads the wiwitan process in the rice fields. The mbahkaum, the oldest person in the village, initiates the procession by praying before cutting some rice, a sign that the rice is ready for harvesting. Prior to the arrival of the people, the farmers had already set up the necessary equipment for the Wiwitan tradition. Once the ritual was over, they would distribute the prepared food to the nearby residents, allowing everyone to participate in the Wiwitan tradition and partake in the communal meal.

2. LITERATURE REVIEW

2.1. Javanese, Tradition and Ethnolinguistic

Javanese culture is one of the traditional cultures in Indonesia. It is pretty old and has been adopted by residents along the Central and East Java regions for generations. Although many Javanese

consider that Javanese culture is only one and not divided, in reality, there are differences in attitudes and behaviours of the people in understanding the culture (Sedyawati, 2003). The definition of tradition, according to Bastomi (1986), is the spirit of a culture; with tradition, the cultural system will be solid. If traditions are eliminated, then there is hope that a culture will end right then and there. Everything that becomes a tradition has often been tested for effectiveness and efficiency. Its effectiveness and efficiency always follow the development of cultural elements. Various forms of attitudes and actions in overcoming problems, if the level of effectiveness and efficiency is low, will soon be abandoned by the perpetrators and will not become a tradition. Of course, a tradition will fit according to the situation and conditions of the community that inherited it (Khiun, 2016).

According to Coomans (1987), Understanding tradition describes human attitudes and behaviours that have been processed in the old period and carried out for generations, starting from ancestors. Traditions that have been cultivated will be a source of one's morals and ethics. Every tradition cannot be separated from traditional ceremonies in a community. The ceremony contains symbolic meanings and ethical, moral, and social values that become normative references for individuals and communities living an ordinary life (Sumaatmadja, 1996).

The mythical mind is the attitude of a man who feels himself besieged by the supernatural forces around him, namely the power of the gods of the universe or the power of fertility. The ontological mind, a mindset that no longer succumbs to the influence of mythic power but actively seeks to scrutinize all aspects of it, initiates a distancing process from the perceived surroundings. The mystical mind is a realm of thought related to the mystical/occult world (Van Peursen, 2013). At this stage, man begins to compile a teaching or theory about the basis of the nature of everything and everything according to its details. In the functional mind, individuals strive to depict the prevailing forces or transform everything into a tangible experience. In reflection, social consciousness, art, and religion, humans strive to understand whether something holds significance or lacks it (Syakhrani & Kamil, 2022).

This stage marks the beginning of man's distancing from everything around him as he begins to examine it in search of an essence based on his scientific knowledge. This stage is characterized by humans no longer living in mythic power but being free to examine anything. The anthropocentric view, also known as the ontological dimension, depicts humans as assertive and in control of nature. The functional mind refers to how humans seek to express the forces around them or transform them into experiences. In reflection, social consciousness, art, and religion, humans strive to determine whether something carries meaning or lacks it (Van Peursen, 2013).

Ethnolinguistics is a linguistic science that was only discovered at the beginning of the 20th century until now. Ethnolinguistics comes from the words ethnology and linguistics, which were born because of a merger between the approaches usually done by ethnologists (now cultural anthropology) and linguistic approaches (Ahimsa-Putra, 1997). Despite valuable insights, especially in comparative ethnolinguistic histories, the book tends to err toward allowing the typology to erase significant differences (Davies & Dubinsky, 2018). Ethnolinguistics or linguistic anthropology is a part of science that, at the beginning, was closely related to anthropology. His research is in the form of a list of words, paintings of language characteristics, and grammar of various ethnic languages scattered in various places on this earth, which are collected together with

ethnic cultural materials. Ethnolinguistics is a subfield of linguistic anthropology that studies the relationship between language and culture, and they mutually influence and inform each other from Haviland (Kim-Maloney & Baydak, 2015). Linguistically diverse societies tend to exhibit higher levels of creativity and innovation, which implies that regardless of the choice of benchmark year, historical ethnolinguistic diversity may not serve as a plausible exogenous source of current productivity and innovation because multilingualism can spread faster in multiethnic regions. At the same time, the immediate effects may dissipate over time in the presence of multilingual decline.

On the contrary, our argument implies that historical exposure to multilingual environments disseminated the formation of various informal institutions, especially cultural traits and civic virtues directed towards higher levels of social trust, a preference for horizontal cooperation as opposed to vertical control, greater levels of social capital such as volunteerism, participation in civic initiatives and non-profit motives among several others (Focacci & Kovac, 2023). Ethnolinguistic studies are divided into two, namely, a) linguistic studies that contribute to ethnology and b) ethnological studies that contribute to linguistics. Ethnology is a branch of cultural anthropology that studies human culture by conducting a comparative approach to individual cultures found on earth. This understanding contains two essential aspects that are interconnected, namely, between language and community culture. Ethnolinguistics is a science that examines the ins and outs of the relationship between various language uses and cultural patterns (Sudaryanto, 1996). Language is closely related to the culture of the people who own the language. A linguist cannot explore a word's semantic dimension because this requires considerable field research. Ethnologists can contribute to linguistics (Ahimsa-Putra, 1997). The ethnolinguistic birth is closely related to the "Sapir-Whorf" hypothesis. The "Sapir-Whorf" hypothesis is called language relativism from the mind of Boas (Subroto, 2003). The hypothesis states that human language shapes or influences the environment, human perception of the reality of its environment or human language influences the environment in processing and creating categories of reality around it. Ethnolinguistics is a science that examines the ins and outs of the relationship between various language uses and cultural patterns (Fitriah et al., 2021). Ethnolinguistics is a branch of anthropolinguistics that examines the relationship between languages and their speakers' behaviour or cultural activities. Ethnolinguistics is a type of linguistics that pays attention to the language dimension (vocabulary, phrases, clauses, discourses, other lingua units) in a broader social and cultural dimension to promote and maintain cultural practices and social structures of society (Abdullah, 2013).

Experts conclude that ethnolinguistics is a science that examines the intimate connection between language and culture, specifically the role of culture in a particular area. Language is one of the communication tools used daily by all circles of society. The language varies: Sundanese, Javanese, Batak, and many more. Similarly, the traditions and characteristics of a culture vary depending on its specific region. Like the Javanese, various cultures and languages inhabit Java, serving as mother tongues or daily languages for communication despite distinct accents and dialects in each region. Despite their differences, they all speak the same language, Javanese.

3. METHODOLOGY

3.1. Ethnography

Qualitative research examines data collected and expressed in words and pictures (Moleong, 2005). Interviews between researchers and informants arrange these words into sentences. This research applies ethnographic methods. Sukmadinata (2019) suggests that the ethnographic method describes and interprets cultures, social groups, or systems. Despite the broad definition of culture, ethnographic studies typically concentrate on patterns of activity, language, beliefs, rituals, and ways of life. Ethnography is an empirical and theoretical method that aims to describe and analyze culture intensively based on field research. The task of ethnographers involves detailing local life and connecting it to broader social processes. This study aims to gather comprehensive information about the harvest wiwitan tradition in Guling Village, Pakunden, Ngluwar, Magelang, and Central Java. We collected the information by conducting in-depth interviews with community leaders or individuals. The research data is sourced from the oldest figure, mbahkaum, in Guling Village, Pakunden, Ngluwar, Magelang, and Central Java.

Data collection techniques are used to collect research data. Refer to the quality research approach and data sources used. This study employed data collection techniques such as conducting in-depth interviews with the community's oldest person, known as mbahkaum. We used the interview to communicate with mbahkaum, the village's oldest or deceased person, Mr. Jumadi, an elderly person who knew or participated in the harvesting of witan traditions in Guling Village, Pakunden, Ngluwar, Magelang, and Central Java.

4. RESULT AND DISCUSSION

4.1. Wiwitan Harvest Tradition Ritual

Wiwitan tradition is a rice harvesting tradition that is usually carried out by villagers as a form of gratitude for the rice harvest. In particular, this gratitude is addressed to *Sedulur Sikep* to Dewi Sri. This tradition is often carried out by farming communities, especially in Central Java before the rice harvesting process.

In Guling Village, some of the residents work as farmers. As Mr. Jumadi has said, the residents in the village are still very thick with traditional culture and traditional ceremonies and still believe in myths. Mr. Jumadi is a smart man in Guling Village. The majority of the population in Guling Village remains deeply rooted in Javanese religion. Residents always participate in the traditional Wiwitan harvest ritual, believing that the revered Dewi Sri will consistently provide favorable outcomes during harvest season. If a resident fails to follow the tradition of harvesting wiwitan, they believe that Dewi Sri's anger will result in a poor or unsatisfactory harvest during the harvest season.

In Guling Village, the harvesting of Wiwitan tradition can take place in the morning, afternoon, or evening, but after Isya, it typically occurs on the eleventh, fourteenth, fifteenth, and certain good days. Avoid doing it on Saturday Pahing, as it is considered the Queen's birthday. If you break the rules and perform the ritual on the day of the Queen's birth, it will bring bad luck or hinder the fertility and abundance of the rice plant.

Mr. Jumadi says that the adoration of Dewi Sri is profoundly embedded in Javanese agricultural traditions and is symbolically presented to "Ibu Mami," or Mother Earth, as an expression of faith and appreciation.

"Bumi, nek wis nitipke sawijining ibu mami kang tandur subur, suket lebur gampangane, kuwi gampangane dongane singkat, dadi pari, sing dadi mbok Dewi Sri. Mbok Dewi Sri dadi diboyong digawe kekiriman. Nah, kuwi diwenehi gangmayang, endok, buntuk-buntuk, yuyu sumpil karo iwak, pithik, nuruti wekdale apik, kogawe ala."

The understanding is that the earth, if it has entrusted seeds to Ibu Mami so that the harvest is fertile, the rice becomes melted or good. It is only the easiest example for a short prayer, so rice, which becomes Ibu Dewi Sri, Ibu Dewi Sri, so a shipment is made. From the shipment there will be a handle of mayang, eggs, bpada (oxtail), yuyusumpil, and chicken. Following his time for his prayer is good or bad. Mr. Jumadi provided information about Ubarampe offerings.

"Tumpeng, kembang, godong dapak seprep, terus enek sajian – sajene ana sumpil, yuyu, iwak kotes sing ana sisike, nganggokake rehyo keno asal ana sisike, nganggopithik ing kung."

So, for ubarampe offerings there are tumpeng, flowers, and other offerings such as *yuyusumpil, kotes* fish that have scales can be replaced with pindang fish which is important to have scales, and use ingkung chicken. Before performing the harvest ritual of the Wiwitan tradition, one must prepare various types of ubarampe. In this ritual, ubarampe refers to offerings. The offerings used in the traditional Wiwitanpanen ritual are as follows:

1. Rice shaped like tumpeng, with chili garnished like a cross and topped with shallots. Rice is meaningful as a symbol of gratitude for the successful harvest season. Rice serves as a tribute to Dewi Sri and Ibu Mami, or Earth, ensuring that pests like rats and leafhoppers do not attack the harvest.
2. Both Kyai Tungguk and Nyai Tungguk use ritual flowers, such as telon or Kembang telon, for their offerings. These flowers carry symbolic meanings such as tansaheleon, which means "always following," and kanugaran, which signifies "magic." It is believed that this delicate creature shields rice from all pests and other supernatural entities. Flowers are also used for bridal mborei (rice), after which spare dadap leaves and mayang handles are picked and used to remove the petitan from the rice. All of this is then roped, banged, and burned, symbolizing the purity of the rice. The menyan used must be white, because it symbolizes that white is clean.
3. After a long struggle to grow rice, people pour Dadap Serep leaves into kendhi and pour it into rice as a symbol to calm the heart and mind by saying *Rep Kedhepdadapserep*.
4. Sumpil or Pincuk, made from banana leaves, is used as a place or container to serve offerings that are brought to the rice fields.
5. Yuyu is believed to protect rice from plant hoppers, rats, and other pests. The residents believe the Yuyu animal is a shield or protector to help keep Dewi Sri for a successful, abundant, and good harvest.
6. Kotes fish or pindang fish that are scaly, if not, should not be, as a means to clean rice, to suck requests, to turn over the ground, so that the request is sincere, if sincere the request can be clean, the rice can also be clean, the harvest will also be good, and you should obey the wishes of those who harvest rice. This practice dates back to the ancestors in Guling village.
7. The native chicken, known as Ingkung, is cooked and served whole. Ingkung serves as a complement to other dishes in the tumpeng, adding to the completeness of the offerings. People interpret Ingkung as an unborn baby, believing it to be faultless or holy. Ingkung

also symbolizes a man's expression of gratitude to God, who gives life. Guling Village traditionally offers ingkung as a form of thanks to God for the bountiful harvest.

Once the offerings were ready for service, the residents of Guling Village collectively brought them to the fields. Mr. Jumadi initiated the Wiwitan procession ritual in honor of the village victim. Mr. Jumadi read prayers in the rice field area, together with residents and rice field owners. Mr. Jumadi offered the following prayer.

"Jawab karo sing ngersa sawah, mugi-mugi paring slamet. Kula ngintun mbok Dewi Sri anggenipun nitipaken wiji, sampun titi wancinipun kula boyong wonten gedong weteng. Mugi paring slamet, paring alemu parine, paring bobot menthes. Lan dijawab donga, donga neng obong menyan. Carane wong ngobong menyan kuwi disingkat utawa didawakke kena, nyadang seneng ngobong menyan. Apa aran ngono yen kejatan bledog putih kebule menyan, pisah ragane menyan. Kula arep ngirim mbok Dewi Sri, utawa arep boyong mbok Dewi Sri, digawa mulih ning gedong peteng, paring murah, paring keket. Mbok Dewi Sri dijawab arep dikethok gulune, ya diamit-amiti, aja lara, aja sambat, ndak diboyong menyang gedong weteng. Terus engko rintisan dijawab cara ana, wajib nek diopeni ya dijawab umpama diwenehi duit sewu opo rong ewu, kuwi ya dijawab iki ana wajib tak pasrahke ning ndak tewer-tewer tak openane. Tembunge jawab mau, merga kuwi angopah-opahi sing kersa bumi, karo sing kersa parine. Yen wis dituntun diobong menyan kuwi, pengantenan umpama dina Rebu, dina Lima lajodo, dina Wolu ya jodo, dina Sanga ya jodo. Terus diklabang, dikembang, diborei. Bar diborei kuwi dimat terus dikembeni, terus diboyong gawa mulih, terus dicantelke, terus kapan rencana arep methek parine."

After the prayer, the event continued with the cutting of rice as a sign that the rice was ready to be harvested. But before that, the owner of the rice field must have prepared some equipment and equipment, namely jugs (clay jars) containing water, ani-ani (tools for memetic rice), roses and telon, menyan, and jarik cloth to wrap rice that has been harvested by Mr. Jumadi earlier.

After the ritual, the owner of the rice field will distribute the food that has been prepared to the surrounding residents. All residents without exception can get the food. The food prepared is rice, boiled eggs, spare dadap leaf stew, kotes fish or pindang fish, and shredded chicken ingkung and placed in a banana leaf pincuk place.

In Guling Village, Pakunden, Ngluwar, Magelang, Central Java, the Wiwitan harvest ceremony is much more than a tradition—it’s a heartfelt part of village life, handed down through the generations. From grandparents to young children, nearly everyone joins in this ceremony, holding tightly to their roots. As Mr. Jumadi says, *“Meh kabeh nglakoni upacara wiwitan panen,”* meaning “almost everyone participates in the Wiwitan harvest ceremony.” For the people of Guling, preserving Wiwitan isn’t just about keeping a custom alive. It’s about honoring their heritage, embracing the myths and mysteries woven into the ceremony, and connecting with each other and the land they depend on. Wiwitan, for them, is a beautiful expression of unity, tradition, and respect.

"Ana, kuwi mula jawab e Tungguk. Kula jawab kyai Tungguk utawa nyai Tungguk. Sira kula lampahi, mila kula ngintun mbok Desri onten kyai Tungguk/nyai Tungguk, ya sapa sing nunggu nunduk kene ning lingkungan kono, mula sesaji terus lebar kuwi tumbuk dipasrahke. Terus njupuk komplit dinggo nyebari sawah kui, sing picek tuntunen, sing budheg gendongen. Nah, disebar

terus dijawab, lah ana kuwi sing barang tetunggu ning kono diopahi kui mau, lah kuwi diarani alam gaib. Yo dimaknani secara logika daru silepe panenan ngelongi dadi dicawisi."

In the midst of the development of this modern era, the wiwitan tradition began to be abandoned by most people, even very rarely found, but residents of the community in Guling village Pakunden, Ngluwar, Magelang and Central Java still carry it out even they feel the tradition needs to be preserved and maintained. But because of the development of this era when viewed in terms of natural thinking ontology, humans began to distance themselves from this harvest wiwitan tradition, and they began to look for the truth about this harvest wiwitan tradition whether it was necessary to do it according to the rules that had existed since the ancestors long ago. Some young men I met in Guling Village said that this wiwitian tradition should be maintained and preserved even though it is not a necessity.

When viewed from the perspective of functional minds, the tradition of harvesting wiwitan in Guling village Pakunden, Ngluwar, Magelang, and Central Java no longer holds significance. Actually, in the reality that exists today, this tradition is no longer meaningful if it is done. In contemporary times, individuals employ scientific methods to maintain the fertility of rice plants, with consistently positive outcomes. Nowadays the residents try to create a channel or irrigation from the spring in the area, then the farmers or residents work together to make the irrigation and drain it in every rice field that will plant rice, so that all farmers can get water to fertilize their crops. When harvest time arrived, some residents had already modernized their methods by using sophisticated tools such as ani-ani. When harvesting is done manually, it requires many people and takes a long time. However, by using the latest sophisticated tools, harvesting can be done more quickly, efficiently, effectively, and saves time.

5. CONCLUSION

The harvest wiwitan tradition in Guling Village Pakunden, Ngluwar, Magelang, and Central Java leads to the conclusion that, despite the rituals' heavy reliance on mystical elements, the village's residents strongly believe in these mystical elements. The villagers must determine the date and day for the rituals. Offerings, each with its meaning and symbol for the fertility of the rice planted, are used in rituals. The offerings used for the traditional Wiwitan harvesting ritual in Guling Village differ significantly from those often held elsewhere. In other places, the offerings are typically made from crops, beans, and vegetables, such as warehouses or wraps. In the village of Guling, they do not use it because they have a philosophy for each offering presented during the ritual. The prayers offered at the start of the ritual procession differ from those of most traditional Wiwitan ceremonies in other places. In Guling Village, the mythical mindset still encompasses the Wiwitan harvest tradition, as they believe performing this ritual is essential, and neglecting it could negatively impact their crops. However, from an ontological perspective, some young individuals in the village maintain and preserve the Wiwitian tradition, even though it is not essential. So, they assume this tradition is solely to maintain and preserve the culture passed down for generations. They aim to increase the awareness of their village's culture among a wider audience. Regarding functional minds, the tradition has been abandoned and is no longer meaningful in today's development because they believe there are other ways to continue fertilizing rice plants.

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Pull & Push Factors Influencing Motivation of International Faculty Members in Hunan Province of China

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ABSTRACT
This study examines the factors influencing academics' motivation to relocate to Hunan Province, China, for career advancement, focusing on the relative impact of "pull" factors (e.g., career development opportunities, institutional support) and "push" factors (e.g., limited opportunities in their home countries). A multiple regression analysis revealed that both pull ($\beta = 0.710$, $p < 0.001$) and push factors ($\beta = 0.358$, $p < 0.001$) significantly affect motivation, with pull factors having a stronger influence. The model was statistically significant ($p < 0.001$) with no multicollinearity issues (Tolerance = 0.776, VIF = 1.289). A Principal Component Analysis (PCA) with Varimax rotation identified two distinct components: Component 1 (Pull Factors) had strong loadings (0.508 to 0.744) on variables such as career development and quality of life, while Component 2 (Push Factors) showed moderate loadings (0.181 to 0.421) on variables related to limited opportunities and political instability. These findings suggest that while push factors contribute to relocation decisions, the primary motivators are the positive opportunities offered by Hunan Province, highlighting the importance of strengthening pull factors to attract academic talent.

Keywords: International faculty members (IFMs), Motivation, Push factors, Pull factors, Academic mobility, Self-actualization

1. INTRODUCTION

Globalization has significantly influenced academia, drawing increased attention from policymakers, administrators, and researchers alike (Deardorff et al., 2023). In this context, the mobility of academic faculty across borders has become a crucial element of higher education dynamics, contributing to the diversity of perspectives within educational institutions (Aryal et al., 2024). This diversity is pivotal in fostering a vibrant and inclusive academic environment. Consequently, understanding the motivations and challenges of international faculty is essential for effective management and strategic development in higher education sectors.

Hunan Province has emerged as a notable hub for higher education in China due to its robust economic growth and rich cultural heritage, attracting many international faculty members. Despite their critical role in enriching the academic landscape, there is a noticeable scarcity of research focused on the motivations and experiences of these international educators in Hunan. This research gap is significant given the potential benefits of such studies in improving institutional policies and practices.

This study explores the motivations, challenges, and opportunities faced by international faculty in Hunan Province. By analyzing survey data from these faculty members, the research seeks to

uncover the factors influencing their decision to engage in academic roles within the region. Higher education institutions and policymakers aim to use the insights gained to create more supportive environments that foster the success and contribution of international faculty to the academic community.

Furthermore, the significance of this study extends beyond local academic enhancements. As Kuhn (2018) highlighted, China's commitment to international openness and engagement is pivotal to its educational and national development strategies. The strategic integration of international talents is crucial, as underscored in China's National Medium and Long-term Talent Development Outline (2015-2025). The current landscape, characterized by a rapidly globalizing knowledge economy, necessitates reevaluating educational systems to accommodate better international academic mobility (Alemu & Cordier, 2017).

Despite efforts to enhance educational openness, disparities persist, particularly between affluent urban areas and less-developed regions. This study addresses these issues by proposing strategies to improve Chinese higher education institutions' inclusivity and support mechanisms. It creates a dynamic, diverse, responsive educational environment that aligns with China's global engagement and development aspirations.

In essence, this study not only fills a critical research gap but also serves as a foundational effort to understand and enhance the experiences of international faculty in China. We expect the outcomes to inform and shape policies that support and retain international talent, thereby reinforcing China's educational and developmental ambitions on the global stage. Figure 1 illustrates the Push and Pull framework below.

1.1. Research Objectives

1. To identify and analyze the key Pull and Push factors influencing the motivation of international faculty members to seek employment in Hunan Province, China, including career development opportunities, research resources, international experience, political instability, career dissatisfaction, and limited professional growth in their home countries.

2. To evaluate the impact of different motivations, institutional and cultural support, and evolving incentives on job satisfaction and academic mobility, and to provide strategic recommendations for universities and policymakers in China to attract and retain international faculty members.

1.2. Research Hypotheses

Hypothesis 1: Career development opportunities (X1), research opportunities and resources (X2), and a supportive institutional environment (X7) have a positive impact on the likelihood of academic relocation.

Hypothesis 2: Political instability (X9) and career dissatisfaction (X12) in one's home country have a negative impact on the decision to remain in the home country, thereby increasing the likelihood of academic relocation. The Push and Pull framework as shown in Figure 1 below.

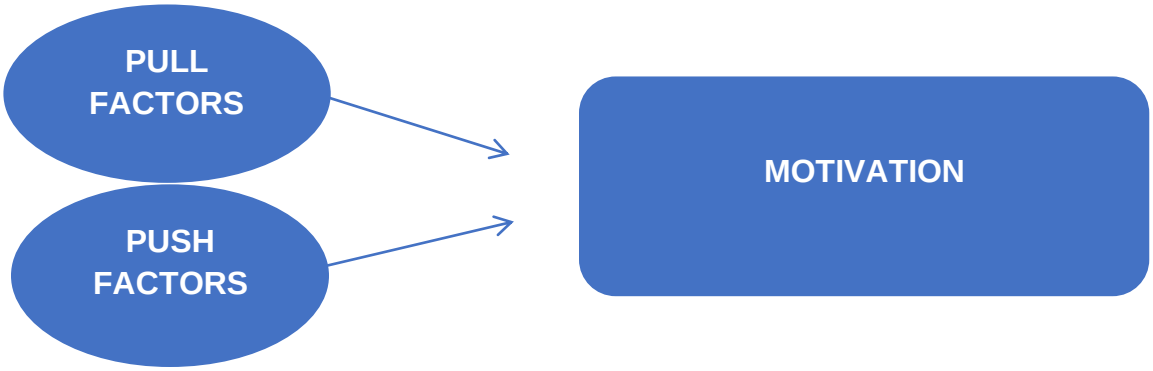

Figure 1: Push-Pull Framework

2. LITERATURE REVIEW

The proliferation of studies on academic mobility reflects the impact of globalization in higher education and other disciplines, including psychology, sociology, and career development, where the focus ranges from individual experiences to broader intercultural dynamics (Marginson, 2016; Altbach & Knight, 2007). Research often compares the mobility of corporate employees with academic professionals, highlighting different emphases in research agendas (Bassett & Maldonado-Maldonado, 2009). Studies typically explore diverse individuals relocating to a shared host country or those from a single country working internationally, which helps understand phenomena like brain drain or brain gain (Kim et al., 2013; Lee & Kuzhabekova, 2018). This review navigates through these dimensions to better understand the motivations of international mobile academics, particularly in the context of Hunan Province (Bauder, 2012; Marginson & Rhoades, 2002).

2.1. Motivation Factors

This investigation systematically examines the factors affecting international faculty members who choose to work in Hunan Province. These factors encompass improved compensation, more research opportunities, the aspiration for foreign experience, and various career or personal objectives. This research examines how several motivational factors, based on Maslow's Hierarchy of Needs (1943), Herzberg's Two-Factor Theory (1959), and Vroom's Expectancy Theory (1964), influence the decision-making process of worldwide academic talents (Maslow,1943; Herzberg et al., 1959; Vroom, 1964).

2.2. Pull Factors of Motivation

Research identifies various motivations attracting international faculty to regions like Hunan Province, China. Career development opportunities significantly influence these decisions, with tenure-track positions and leadership roles being key factors (Tahir et al., 2018). Access to research funding and collaborative networks also plays a crucial role, alongside the prospect of gaining international experience and expanding professional networks (Jiang & Doudna, 2017). Quality of life, including housing affordability and healthcare facilities, influences faculty decisions significantly (Cao et al., 2020). Additionally, competitive compensation packages and institutional prestige are critical in attracting top-tier talent (Li & Wang, 2016). A supportive institutional environment with clear policies and mentorship programs further helps integrate international

academics into the community (Kim et al., 2013). Understanding and enhancing these factors can help make Hunan Province more attractive to international faculty, promoting a vibrant academic environment.

2.3. Push Factors of Motivation

Research outlines several push factors that drive international faculty to seek employment abroad, particularly in regions like Hunan Province, China. Limited career opportunities, including few tenure-track positions and stagnant academic environments in their home countries, prompt academics to look overseas (Rinke & Mawhinney, 2017). Political instability and economic challenges also influence their decisions to move to more stable regions (Onsman, 2012). The desire for academic freedom and intellectual exchange is another motivating factor for relocating to regions where these values are upheld (Mazzarol & Soutar, 2002). Quality of life concerns, such as safety and healthcare, career dissatisfaction and burnout due to heavy workloads and bureaucratic challenges, are significant considerations (Velema, 2012).

Discrimination and lack of inclusivity can also drive academics from underrepresented groups to seek opportunities in more diverse settings (Fu, 2011; Horwitz, 2013). Pursuing professional development and exposure to new academic methodologies also motivates academics to move abroad (Garcia & Gonzalez, 2016). Understanding these push factors can help institutions better support and attract international faculty, fostering a diverse and inclusive academic environment.

3. RESEARCH METHODOLOGY

The study uses a cross-sectional survey design to collect data from international faculty in Hunan Province, offering a snapshot of their experiences and motivations at a specific time. A structured questionnaire, crafted from existing literature and theories, includes demographic details and queries about motivations, challenges, opportunities, and satisfaction. This survey features both closed-ended and open-ended questions to gather diverse perspectives.

3.1. The Population / Sample Group

The study utilized a purposive sampling strategy to select international faculty members from various academic disciplines at higher education institutions in Hunan Province. Over the last five years, the average population size of these faculty members has been approximately 3,200, comprising both permanent staff and visiting scholars.

A purposive sample of 346 international faculty members from diverse backgrounds in Hunan, determined using Krejcie and Morgan (1970), was selected, ensuring diversity, voluntary participation, and privacy while minimizing bias.

3.2. Data Collection

Data were collected through an online survey distributed to international faculty members via email or institutional networks. Participants were informed of the study's purpose and assured of the confidentiality and anonymity of their responses. The survey remained open for a specified period, during which faculty members had the opportunity to respond at their convenience.

3.3. Validation and Reliability

The survey was pre-tested on a small group of international faculty members to ensure clarity and comprehensibility of the questions. Based on feedback received during the pre-test, adjustments were made to enhance the survey's quality. Reliability checks, including internal consistency measures, were conducted to ensure the survey's accuracy and consistency in capturing the intended variables.

Table 1: Reliability

Cronbach's Alpha		**Cronbach's Alpha Based on Standardized Items**	**No of Items**
.930		.930	17
Item Statistics			
	Mean	**Std. Deviation**	**No**
X1	3.4364	1.07555	346
X2	3.5116	1.17023	346
X3	3.5202	.85526	346
X4	3.4422	.80098	346
X5	3.5607	.88666	346
X6	3.3208	.73305	346
X7	3.3353	.67483	346
X8	3.4884	.89839	346
X9	3.5289	1.03309	346
X10	3.6647	1.01455	346
X11	3.4335	.85291	346
X12	3.5809	.79534	346
X13	3.6532	.81005	346
X14	3.3902	.66882	346

Y1	3.3960	1.13540	346
Y2	3.4595	1.07398	346
Y3	3.6185	1.14922	346

Table 1 displays the reliability of the scale, measured using Cronbach's Alpha, is 0.930, indicating excellent internal consistency across the 17 items. The Cronbach's Alpha based on standardized items is also 0.930, confirming the robustness of the scale. The table also presents the item statistics, showing the mean and standard deviation for each of the 17 items (X1 to X14, Y1 to Y3) with 346 respondents. The mean values range from 3.3208 to 3.6647, and the standard deviations range from 0.66882 to 1.17023, suggesting moderate variability in responses across items.

Table 2: Validity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.908
Bartlett's Test of Sphericity	Approx. Chi-Square	2586.295
	Df	91
	Sig.	.000

Table 2 displays The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy assesses the suitability of the data for factor analysis. A KMO value closer to 1 indicates that a factor analysis may be useful, while values below 0.5 suggest that the data may not be suitable for such analysis. The Bartlett's Test of Sphericity checks whether the correlation matrix is an identity matrix, which would indicate that variables are unrelated and unsuitable for structure detection. It provides an approximate Chi-Square value, degrees of freedom (df), and a significance level (Sig.). A significant result ($p < 0.05$) from Bartlett's test suggests that the data is appropriate for factor analysis.

3.4. Data Analysis

1. Descriptive Statistics: Basic descriptive statistics such as frequencies, percentages, means, and standard deviations summarized the demographic characteristics and survey responses, providing an initial insight into the sample's composition and perspectives.

2. Inferential Analysis: Chi-square tests analyzed associations between categorical variables. T-tests and analysis of variance (ANOVA) compared means across groups to assess differences in variables like job satisfaction. Correlation analysis determined the strength and direction of relationships between continuous variables, such as the impact of motivations on job satisfaction.

3. Regression Analysis: Multiple regression analysis explored relationships between variables like motivations and outcomes including job satisfaction, adjusting for potential confounders. This provided insights into the relative influence of different factors on international faculty outcomes.

4. RESEARCH RESULTS

4.1. Descriptive Statistics

Table 3: Demographic Characteristics of Respondents

Characteristics	Frequency (%)
Age	
Below 30	24.3%
31-40	35.8%
41-50	27.7%
Above 50	12.2%
Gender	
Male	52.9%
Female	47.1%
Degree Level	
Bachelor's degree	18.4%
Master's degree	45.1%
Doctorate degree	36.5%
Purpose of Stay in China	
Better pay	28.1%
Research opportunities	14.7%

Characteristics	Frequency (%)
International experience	37.2%
Challenge/Opportunity	
Language barrier	39.6%
Cultural shock	28.6%
Opportunities for professional self-actualization	45.2%

Table 3 presents the demographic characteristics and experiences of 346 international faculty members in Hunan Province, China. The age distribution shows 35.8% are aged 31-40, making it the largest group, followed by 27.7% aged 41-50, 24.3% below 30, and 12.2% above 50. Gender representation is pretty balanced, with 52.9% male and 47.1% female. The majority hold advanced degrees: 45.1% have a master's degree, 36.5% have a doctorate, and 18.4% hold a bachelor's degree. The primary motivations for their stay include seeking international experience (37.2%), better pay (28.1%), and research opportunities (14.7%). Challenges faced include a language barrier (39.6%) and cultural shock (28.6%), but there are significant opportunities for professional self-actualization, as 45.2% of the respondents noted. This information highlights the diverse backgrounds and the mix of challenges and opportunities international faculty encounter in China.

4.2. Correlation Analysis

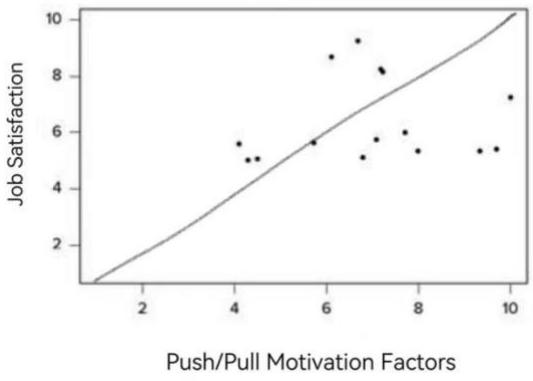

Figure 2: Correlation Between Motivations and Job Satisfaction

Figure 2 displays the relationship between the motivations of international faculty members and their job satisfaction in Hunan Province, China. Each data point represents a survey observation, with motivations plotted on the x-axis and job satisfaction on the y-axis. A linear trend line indicates a positive relationship, suggesting that higher motivation levels correlate with greater job

satisfaction. The Pearson correlation coefficient of 0.46 further supports a moderate positive correlation, indicating that increased motivations are typically associated with higher job satisfaction among the faculty. This relationship underscores the significant impact of motivational factors on job satisfaction.

4.3. Regression Analysis

Table 4: Regression

Regression Model Summary [b]										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change	
1	.934[a]	.872	.871	.34724	.872	1168.469	2	343	.000	1.971
a. Predictors: (Constant), Push Factors, Pull Factors										
b. Dependent Variable: Y										

Table 4 presents the regression model summary for the study, showing the relationship between the dependent variable (Y) and the predictors, "Push Factors" and "Pull Factors." The model demonstrates a strong correlation, with an R value of 0.934, indicating a high level of association between the predictors and the dependent variable. The R Square value of 0.872 suggests that approximately 87.2% of the variance in the dependent variable is explained by the model. The adjusted R Square value of 0.871 confirms the model's robustness after adjusting for the number of predictors. The standard error of the estimate is 0.34724, reflecting the average distance between the observed and predicted values. The change statistics indicate a significant R Square change of 0.872 with an F change of 1168.469 (df1 = 2, df2 = 343), and a significance level (Sig. F Change) of 0.000, confirming the model's overall significance in predicting the dependent variable.

Table 5: ANOVA

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	281.783	2	140.891	1168.469	.000[b]

	Residual	41.358	343	.121		
	Total	323.141	345			
a. Dependent Variable: Y						
b. Predictors: (Constant), Push Factors, Pull Factors						

Table 5 displays the ANOVA results for the regression analysis, assessing the impact of "Push Factors" and "Pull Factors" on the dependent variable (Y). The table shows that the regression model explains a significant amount of variance in the dependent variable, with a regression sum of squares of 281.783 and 2 degrees of freedom (df). The mean square for the regression is 140.891. The residual sum of squares is 41.358, with 343 degrees of freedom, indicating the variance not explained by the model. The F-value of 1168.469, with a significance level (Sig.) of 0.000, confirms that the model is statistically significant, demonstrating that the predictors ("Push Factors" and "Pull Factors") have a meaningful impact on the dependent variable.

4.4. Summary

The regression analysis indicates a robust positive correlation (R = 0.934) between the factors influencing individuals' relocation—push Factors and Pull Factors—and their motivation to move to Hunan Province. The model, with an R Square of 0.872, effectively accounts for 87.2% of the variance in motivation, indicating a strong match. The improved R Square (0.871) further substantiates the model's resilience, signifying its trustworthiness. A minimal standard error of 0.34724 indicates that the model's predictions roughly correspond with actual results.

The ANOVA findings indicate that the regression sum of squares (281.783) demonstrates the model's significant contribution to variance, while the minor residual sum (41.358) implies minimal unexplained variation. The substantial F-statistic (1168.469, $p < 0.001$) highlights the model's overall relevance, affirming its efficacy in elucidating the links between the variables and motivation.

The intercept (-1.742) is a motivational benchmark concerning the coefficients. Pull Factors (B = 0.985, Beta = 0.710, $p < 0.001$) have the most substantial influence on motivation, although Push Factors (B = 0.520, Beta = 0.358, $p < 0.001$) also play a significant role, albeit to a lower extent. Collinearity statistics (Tolerance = 0.776, VIF = 1.289) indicate that multicollinearity is not an issue in the model.

The research indicates that the model accounts for a significant percentage of the motivation to relocate, with Pull Factors as the primary influence. The model is statistically significant and devoid of multicollinearity concerns, hence affirming its validity.

5. DISCUSSION

This research advances our understanding of international academic mobility by integrating the push-pull framework with regional and geographic dimensions. It highlights how these factors interplay to influence the mobility decisions of international faculty in China. Significantly, it confirms China's appeal as a magnet for global talent, evidenced by positive correlations between the enjoyment of faculty stays and tenure longevity, emphasizing the role of favourable experiences in influencing mobility decisions (Onsman, 2012).

Applying Herzberg's Two-Factor Theory further enriches this discussion, categorizing motivators and hygiene factors to explore what influences job satisfaction among international faculty in Hunan Province (Herzberg et al.,1959). This theory underscores that while motivators such as career development and international exposure directly enhance job satisfaction, hygiene factors like competitive compensation and stable environments are essential to prevent dissatisfaction. Thus, a dual focus on enhancing motivators and hygiene factors is crucial for academic institutions in Hunan seeking to attract and retain international faculty. This approach aligns with faculty's intrinsic and extrinsic motivations and supports the broader goal of internationalization within China's rapidly evolving educational landscape (Herzberg et al., 1959).

The research indicates that the model accounts for a significant percentage of the motivation to relocate, with Pull Factors as the primary influence. The model is statistically significant and devoid of multicollinearity concerns, hence affirming its validity.

6. CONCLUSION AND IMPLICATIONS

6.1. Conclusion

The study revealed that international faculty members in Hunan Province are primarily motivated by better pay, research opportunities, and international experience. International experience emerged as the dominant factor in predicting job satisfaction. Despite facing language barriers and cultural shock, these faculty members benefit from substantial professional growth opportunities.

The findings underscore a shift from traditional motivations—where salary was once the primary incentive—to a greater emphasis on international experience, reflecting the evolving dynamics of academic mobility. International faculty members (IFMs) view this experience as crucial for enhancing career competitiveness and its intrinsic benefits, such as fostering intercultural competence and self-actualization.

The research supports the hypothesis that international experience significantly correlates with job satisfaction, suggesting that IFMs value experiential enrichment and professional growth over financial gains. This indicates a broader trend where academic mobility extends beyond economic factors to include academic and intellectual capital contributions.

In response, the study suggests that universities and policymakers in China should develop retention strategies that go beyond financial incentives, leveraging Chinese cultural elements and professional development opportunities to attract and retain IFMs. By fostering a supportive environment that caters to the holistic needs of IFMs, China can enhance its appeal as a premier destination for international academicians and strengthen its position in global academic and cultural exchanges.

6.2. Implication

Given the strong influence of pull factors, stakeholders in Hunan Province must focus on enhancing these positive aspects to attract and retain international scholars effectively. Strategic actions should include:

Expansion of Career Development Programs: Develop and implement comprehensive programs that support academic career growth, including mentorship opportunities, professional development workshops, and networking events. Increase in Research Funding: Boost financial support for research initiatives and provide grants and fellowships to facilitate high-quality research and attract top-tier researchers. Improved Living Conditions: Invest in improving academics' overall quality of life by upgrading housing facilities, improving healthcare services, and creating vibrant community environments.

The results have important implications for higher education institutions in Hunan Province. Efforts to attract and retain international faculty should focus on offering competitive pay and robust research and career development opportunities. Institutions should also prioritize creating enriching international experiences, such as language support and cultural immersion programs, to improve job satisfaction among international faculty. Policymakers should consider these findings when developing immigration and employment policies to support international faculty in China. Streamlining visa and work permit processes may help alleviate some of the challenges international faculty face. The study contributes valuable insights into the experiences and motivations of international faculty members working in Hunan Province. These findings help fill a gap in the existing literature and provide a foundation for future research on regional international academic mobility.

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Impact of Leadership and Corporate Culture on Organizational Performance of Small and Medium- Sized Enterprises

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ABSTRACT

This study explores the influence of distinct leadership styles and corporate culture on the organizational performance (OP) of small and medium-sized enterprises (SMEs) in Guangxi, China. Based on data gathered from 400 participants, it delves into the effects of Transactional, Transformational, and Charismatic Leadership, alongside key corporate culture traits such as Mission and Consistency Characteristics, on enhancing organizational performance. The regression analysis underscores a strong positive correlation between these leadership styles and cultural attributes, demonstrating their critical role in driving improved organizational outcomes. Moreover, the study reveals that when leadership behavior is aligned with corporate culture, a powerful synergy is created, further amplifying their collective impact on performance. These findings offer valuable insights for SMEs, highlighting the significance of cultivating leadership that inspires and motivates employees, while fostering a mission-driven and consistent corporate culture. In doing so, organizations can boost communication, employee development, and overall performance.

Keywords: Transactional Leadership, Transformational Leadership, Charismatic Leadership, Mission Characteristics, Organizational Performance

1. INTRODUCTION

In China, corporate leadership and corporate culture are critical determinants of the organizational performance of small and medium-sized enterprises (SMEs) (Byrne & Bradley, 2007). This competitive pressure is particularly pronounced for SMEs, which constitute the backbone of the Chinese economy. Leadership and corporate culture are increasingly recognized as key factors driving this performance, especially in less economically developed regions like Guangxi (Conger & Kanungo, 1988). SMEs in Guangxi often face unique challenges compared to their counterparts in wealthier provinces, further underscoring the need for effective leadership and a solid corporate culture to navigate these challenges.

The COVID-19 pandemic has exacerbated many of these difficulties, particularly for SMEs nationwide. The economic fallout from the pandemic has not only disrupted supply chains but also led to sharp declines in consumer demand, forcing many enterprises to undergo mergers, acquisitions, and internal restructuring.

To remain competitive in this dynamic environment, it has become essential for these enterprises to focus on strengthening leadership and cultivating a corporate culture that aligns with their strategic objectives (Chatman, 1989). Studies suggest that leadership and corporate culture are critical factors that can significantly influence organizational performance (Wilderom et al., 2012). Different leadership styles—such as transactional, transformational, and charismatic—are shown to have varying impacts on organizational outcomes (Afsar & Shahjehan, 2018). Moreover, the way corporate culture is structured—whether it emphasizes mission-driven values or operational consistency—also plays a crucial role in determining the success of these enterprises.

1.1. Research Questions

1. How do leadership styles and corporate culture individually and collectively influence organizational performance in Chinese SMEs?

2. What strategies and methods can Chinese SMEs adopt to optimize their leadership styles and corporate culture to improve organizational performance?

1.2. Research Objective

1. To analyze the impact of Leadership styles on Organization performance.

2. To examine the role of corporate culture.

3. To investigate the combined effect of Leadership and corporate culture on Organization performance.

The study is based on the following hypothesis. Figure 1 illustrates Research framework that shows how leadership and corporate culture forms organizational performance.

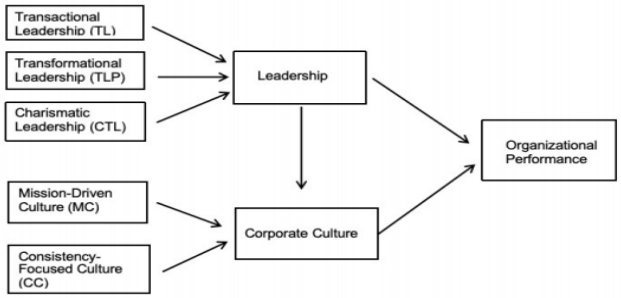

Figure 1: Research Framework

2. THEORIES AND RELATED RESEARCH

According to related studies and using Slovin's formula, which is commonly applied to determine sample size when the population is known and a specific margin of error is required, the sample size for this study was calculated to be 400. This was based on the estimated population of SMEs

in Guangxi and a margin of error 0.05, ensuring both accuracy and representativeness (Slovin, 1960).

Waldman and Yammarino (1999) introduced the distinction between transformational and transactional leadership, noting that transactional leaders focus on clear objectives and use rewards and punishments to motivate employees. Afsar and Shahjehan (2018) demonstrated that transactional leadership enhances organizational performance in structured industries, such as the Nigerian cement industry, by maintaining compliance and ensuring employees meet defined goals.

Avolio and Yammarino (2013) explained that charismatic leaders inspire deep commitment among employees through their influence and vision. Bass (1985) noted that charismatic leadership generates high levels of organizational commitment, which can lead to superior performance. In SMEs, where personal leadership is often closely tied to company success, charismatic leadership plays a crucial role in driving organizational outcomes (Hall & Chandler, 2005).

Charismatic leadership is particularly relevant in contexts where emotional engagement and loyalty are crucial for organizational success (Hoffman et al., 2011). Conger (1999) explained that charismatic leaders inspire deep commitment among employees through their influence and vision. According to Bass (1985), charismatic leadership generates high levels of organizational commitment, which can lead to superior performance. In SMEs, where personal leadership is closely tied to company success, charismatic leadership is critical in driving organizational outcomes.

3. RESEARCH METHODOLOGY

The research focuses on small and medium-sized enterprises (SMEs) in the Guangxi region of China, chosen for its unique economic development level, industrial structure, and the concentration of SMEs.

3.1. The Population / Sample Group

The Population, according to data provided by the Public Service Platform for SMEs in Guangxi, the number of small and medium-sized enterprises in Guangxi exceeded 40,000 in 2023. The sample size for this study was calculated to be 400, based on the estimated population of SMEs in Guangxi.

3.2. Research Instrument

Research study on “Explore the influence of the leadership and corporate culture of small and medium-sized enterprises in Guangxi on organizational performance” is a combination of quantitative research.

3.3. Data Collection

The questionnaire underwent content validation by three industry experts, enhancing its relevance and accuracy, and achieved a high content validity index. Distributed electronically via www. wenjuanwang.com, responses were rigorously screened for completeness. Data

analysis was performed using statistical software on the same platform, ensuring robust analysis.

3.4. Reliability and Validity

Determination of validity the researcher will check the content validity of each text to ensure that it meets the objectives of the study by consulting with 5 subject matter specialists to examine the clarity of language, wording, and accuracy in the content Consistency of the questions in the questionnaire with the objectives (index of item objective congruency--IOC) with the following scoring criteria:
+ 1: the expert or expert is sure that the question is consistent with the content.

0: the expert or expert is not sure that the question is consistent with the content.

-1: the expert or expert is sure that the question is inconsistent with the content.

3.5. Data Analysis

Descriptive Statistics: Used to summarize and describe the basic features of the data, such as frequencies, means, and standard deviations. Content Analysis: Applied to open-ended responses to identify common themes and insights regarding leadership practices and corporate culture in the organizations surveyed.

4. RESEARCH RESULTS

Table 1: Basic Information of Respondents

Variables		**Frequency**	**percentage**
Sex	Man	218	54.5
	Female	182	45.5
	Total	**400**	**100.0**
Age	18-25 years.	52	13
	26-35 years.	148	37
	36-45 years.	116	29
	higher than 45 years.	84	21
	Total	**400**	**100.0**

Place of work	Guang Xi	400	100.0
	Total	**400**	**100.0**
Position	General Staff	334	83.5
	Middle Management	51	12.75
	Senior Management	13	3.25
	Others	2	0.5
	Total	**400**	**100.0**
Years of experience	Less than 1 year	95	23.75
	1-3 years	168	42
	4-6 years	113	28.25
	7-10 years	15	3.75
	Higher than 10 years	9	2.25
	Total	**400**	**100.0**
Sector	Manufacturing	177	44.25
	Services	103	25.75
	Information Technology	88	22
	Finance	28	7
	Others	4	1
	Total	**400**	**100.00**

Table 1 represents the basic information of respondents. Sex: The gender distribution of the participants showed that 54.5% (218) were male and 45.5% (182) were female. Age: In terms of age distribution, 13% (52) of the participants were 18-25 years old, 37% (148) were 26-35 years old, 29% (116) were 36-45 years old, and 21% (84) were over 46 years old. Position: In terms of position

distribution, ordinary employees accounted for 83.5% (334 people), middle management accounted for 12.75% (51 people), top management accounted for 3.25% (13 people), and other positions accounted for 0.5% (2 people). Years of experience: Regarding the number of years working in the company, less than 1 year accounted for 23.75% (95 people), 1-3 years accounted for 42% (168 people), 4-6 years accounted for 28.25% (113 people), 7-10 years accounted for 3.75% (15 people), and more than 10 years accounted for 2.25% (9 people). Sector: In terms of industry distribution, 44.25% (177) were in manufacturing, 25.75% (103) were in services, 22% (88) were in information technology, 7% (28) were in finance, and 1% (4) were in other industries.

Table 2: Shows the mean and standard deviation all (Total)

	$\bar{X}$	S.D.	MIN	MAX	Mean Interpretation Criteria
TL	3.53	1.17	1	5	High level
TLP	3.37	1.16	1	5	Moderate level
CTL	3.38	1.18	1	5	Moderate level
MC	3.33	1.12	1		Moderate level
CC	3.36	1.15	1	5	Moderate level
OP	3.43	1.11	1	5	Moderate level
Total	3.40	1.15	1	5	Moderate level

Table 2, the overall image survey results for all variables were at a Moderate level (= 3.40). It was found that all aspects were rated at a Moderate level. In order of average to lowest, TL (Transactional Leadership) had the highest mean (=3.53), followed by OP (Organizational Performance) (= 3.43), CTL (Charismatic Leadership) (= 3.38), TLP (Transformational Leadership) (= 3.37), CC (Consistency Characteristics) (= 3.36), and MC (Mission Characteristics) with the lowest mean = 3.33).

Table 3: Analysis of the correlation coefficient between TL, TLP, CTL, MC, CC, OP

Factor	**TL**	**TLP**	**CTL**	**MC**	**CC**	**OP**
TL	1					
TLP	0.34**	1				

CTL	0.29**	0.40**	1			
MC	0.38**	0.42**	0.38**	1		
CC	0.38**	0.39**	0.44**	0.48**	1	
OP	0.40**	0.50**	0.48**	0.54**	0.56**	1

***Statistically significant level 0.01,* p<0.05** p<0.01

From Table 3, the results of the analysis of the correlation coefficient between various leadership styles and organizational traits were found to be significant. Specifically, the correlation coefficient (R) between Transactional Leadership (TL) and Mission Characteristics (MC) was 0.38, indicating a positive relationship. Similarly, Transformational Leadership (TLP) and MC showed a significant positive correlation with an R value of 0.42. Charismatic Leadership (CTL) and MC also presented a positive correlation, with R being 0.38.

TL instead Transactional leadership

TLP instead Transformational leadership

CTL instead Charismatic-typed leadership

MC instead Mission characteristics

CC instead Consistency characteristics

OP instead Organizational performance

Parameter Estimates (n=400)

	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity diagnostics	
	B	Std. Error	Beta			VIF	Tolerance
Constant	1.13	0.15	-	7.41	0.00**	-	-
CTL	0.26	0.04	0.29	6.56	0.00**	1.24	0.800
CC	0.42	0.04	0.43	9.72	0.00**	1.24	.80
R 2			0.38				
Adj R 2			0.38				
F			F (2,40) = 120.70, p = 0.0	00			
D-W value			2.11				

Remark : Dependent Variable= OP

* p<0.05 ** p<0.01

Figure 2: The Results of the Regression

Figure 2 presents the results of the regression analysis on the impact of Charismatic Leadership (CTL) and Corporate Culture (CC) on Organizational Performance (OP). Both variables—CTL and CC—were found to have a significance value (Sig) of 0.00, which is below the 0.05 threshold for statistical significance, indicating their significant impact on Organizational Performance.

The regression analysis confirms that both Charismatic Leadership and Corporate Culture significantly positively impact Organizational Performance, with p-values below 0.01, supporting the robustness of the model. The R^2 value of 0.38 and the adjusted R^2 value of 0.38 indicate that the model explains approximately 37.8% of the variance in Organizational Performance. Additionally, the F-test result ($F(2,397) = 120.70$, $p = 0.00$) and the Durbin-Watson value of 2.11 confirm the absence of significant autocorrelation in the residuals, further validating the model.

5. DISCUSSION

The findings show that leaders play an essential role in aligning their actions with the organization'sorganization's cultural values to unlock the full potential of their teams and drive better performance. The company's culture shapes and influences leadership, fostering a continuous, mutually reinforcing relationship. For SMEs in Guangxi, the path to success involves developing leadership styles that are transformational and charismatic, as these have been shown to be the most effective in enhancing organizational performance. At the same time, cultivating a strong, consistent corporate culture grounded in a clear mission and shared values is critical. This culture brings employees together with a unified purpose, reducing internal tensions and promoting better teamwork. When leadership styles align with this cohesive culture, organizations can adapt more effectively, stay competitive, and thrive even in challenging environments. The message is clear: By merging exemplary leadership with a strong cultural foundation, SMEs can set themselves up for long-term success, offering a blueprint for growth and resilience in a fast-paced business world.

6. CONCLUSION

The findings of this study offer practical implications for SMEs in China, particularly regarding leadership and corporate culture. The results from Table 16 suggest that SMEs should prioritize transformational leadership (TLP) and charismatic leadership (CTL), as these styles have the most substantial positive impact on organizational performance (OP). Specifically, transformational leadership, with a standardized coefficient of 0.32, was particularly effective in fostering innovation and driving long-term success. Regarding corporate culture, the results from Table 21 show that consistency characteristics (CC) had the highest impact on OP, with a standardized coefficient of 0.43. This suggests that cultivating a consistent and mission-driven culture is crucial for improving organizational outcomes.

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Determinants of Blind Box Purchasing Addiction in China: An Empirical Analysis Using the Shopping Addiction Scale

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ABSTRACT

In recent years, the phenomenon of blind box purchasing has experienced a remarkable rise in popularity among young Chinese consumers, reflecting an intrinsic desire for emotional gratification and novelty. This research endeavors to uncover the psychological and economic factors that propel this compelling trend. Employing a mixed-method approach, we amalgamate quantitative data gathered from surveys conducted in major Chinese cities with rich qualitative insights. To rigorously analyze the influence of these factors on purchasing decisions, we utilize binary logistic regression, complemented by the Shopping Addiction Scale to assess levels of shopping addiction. Additionally, we employ ordinary least squares (OLS) regression to quantify the impact of each identified factor on shopping addiction scores, thereby providing a nuanced understanding of this intriguing phenomenon. Our findings reveal that, when controlling for other variables, Risk Aversion, Loss Aversion, and Ambiguity Aversion present significantly negative coefficients, while both Social Environment and Economic Incentives exhibit notably positive coefficients. Importantly, these results corroborate the predictions of our original model, illuminating the intricate interplay of factors that drive blind box purchasing behavior in today's dynamic consumer landscape.

Keywords: Blind Box, Risk aversion, Loss Aversion, Ambiguity Aversion, Shopping Addiction

1. INTRODUCTION

As consumption levels grow, products and services that improve people's quality of life and meet emotional needs are becoming increasingly popular and preferred (Wu, 2023). A typical example of this trend is the emergence of blind boxes. Driven by people's desire for creativity and surprise, blind boxes have gradually occupied the global market, especially among young people in China (Cao, 2024). Blind boxes originally appeared as a marketing strategy. They are sealed packages. The exact items inside cannot be seen from the outside, so consumers buy them without knowing the contents. This strategy creates excellent excitement for consumers about unpredictable items and curiosity about potential rarity, so they are willing to make repeated purchases. The appeal of blind boxes lies in their ability to bring consumers an exciting shopping experience, becoming a common phenomenon in today's social consumption environment.

Shopping addiction, also known as compulsive buying behaviour, is a behavioural addiction characterized by repeated and uncontrollable shopping behaviours, even though the shopper knows that such behaviour will have negative consequences (Aboujaoude, 2014). Shopping addiction is often associated with strong emotional needs and psychological pressure, and shoppers seek short-

term emotional satisfaction and stress relief through purchasing behaviour—repeated failure to resist impulses to perform an act. The characteristics of shopping addiction are particularly evident in blind box purchases. Shopping addicts show higher purchase frequency and more significant purchase amounts (Albrecht et al., 2007; Davenport et al., 2012).

Since the 1990s, the acceleration of globalization and urbanization, along with the rapid development of the Internet, have heralded an era of fast economic growth and information overload. The young people who grew up in this era enjoy superior material conditions and develop unique ideological perspectives and consumer behaviour patterns. Based on the National Bureau of Statistics of China data, the Millennials (born between 1982 and 2000) and Generation Z (born between 1995 and 2009) make up about 37% of the total population, with Generation Z accounting for approximately 264 million. As digital natives, they are open-minded, possess a strong desire to consume, and are curious about new things (Wang & Yang, 2023). This demographic's inclination towards novelty and immediate gratification makes them particularly susceptible to the allure of blind boxes, which offer a unique combination of surprise and excitement, catering to their consumption preferences.

The blind box phenomenon has developed rapidly in the Chinese consumer market, and more and more researchers have attributed this phenomenon to impulsive buying behaviour. Most of these behaviours are influenced by the psychological stimulation of social media and marketing strategies that use consumer impulsivity. For example, studies have shown that the convenience of online shopping and the presence of targeted advertising in social media have greatly enhanced consumers' impulse to buy and may also lead to increased consumer debt (Nyrhinen et al., 2024).

The existing searchable literature explores common shopping addictions and compulsive and impulsive buying behaviours. However, there is a lack of detailed research specifically on addictive behaviours related to blind box purchases. This paper will fill this gap by studying the unique psychological motivations and behavioural patterns triggered by blind boxes. This study aims to provide a quantitative method to evaluate the severity of blind box shopping addiction and its prevalence among consumers, thereby supporting a more targeted formulation of comprehensive consumer protection measures and market supervision policies. Ultimately, this will help foster a healthier and more sustainable consumption environment and reduce the personal and societal costs of addictive purchasing among young consumers. It deepens our understanding of shopping addiction and provides an empirical basis for formulating relevant policies which help protect consumer rights and regulate market behaviour. The findings will attract the attention of policymakers, business strategists, and academics, stimulating broader discussion on this topic.

1.1. Research Objective

1. To examine the factors and personal characteristics that influence consumers’ blind boxes purchase, emphasizing the role of economic incentives, social environment, risk aversion, loss aversion and ambiguity aversion.

2. To utilize the Shopping Addiction Scale to quantitatively measure the extent of shopping addiction related to blind box buying.

3. To examine the factors and personal characteristics that influence blind boxes addition.

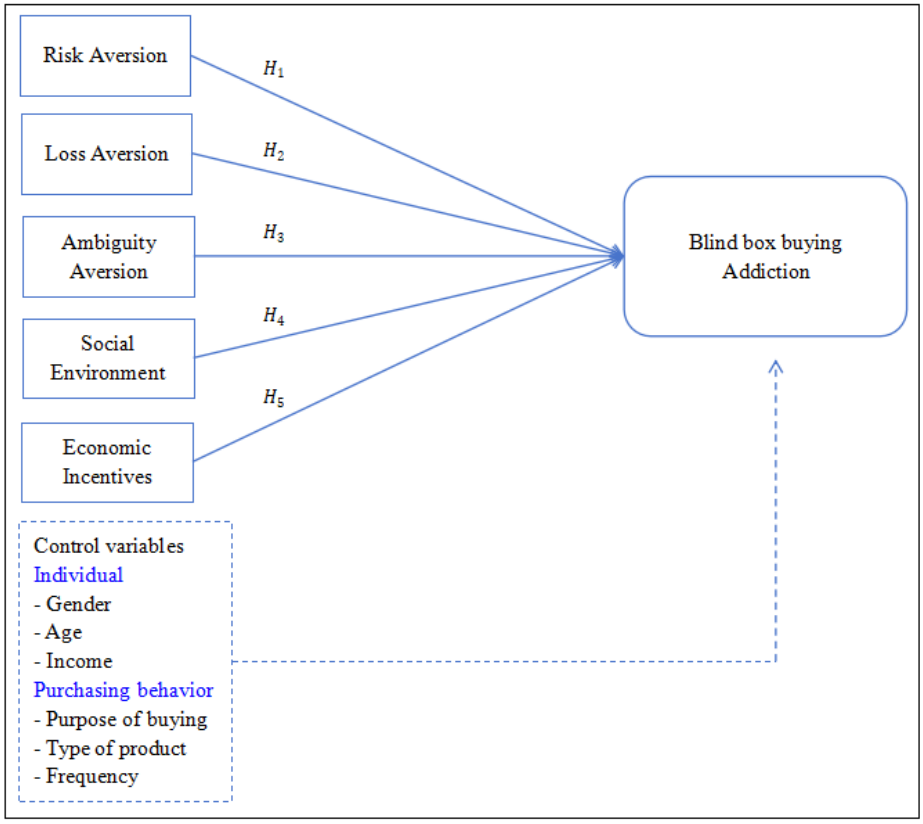

Figure 1: Research Framework

2. LITERATURE REVIEW

2.1. Reviews on the Blind Box

Blind boxes, also known as mystery boxes, are a popular retail product that captivates collectors and pop culture enthusiasts. Figure 1 illustrates the research framework of blind box buying addiction above. The contents of a blind box are unknown to the consumer before purchase, embodying the concept of "blind buying." Each box contains different styles of figurines or collectables, and the exact items remain a surprise until the packaging is opened. As a new product marketing model, blind boxes originated in Japan and quickly gained great success and popularity in the Chinese market. Blind box companies represented by POP MART have attracted many young consumers through the combination with fashion toy IP. In 2016, POP MART's Molly Constellation series of blind boxes achieved breakthrough success in the Chinese market. Since then, China's blind box market has entered a stage of rapid development (Lin, 2023).

One of the main attractions of the blind box market is its randomness. This unknown element excites consumers and makes them addicted to continuous purchases. Blind box marketing takes advantage of consumers' excitement to transform product consumption into emotional consumption, making consumers willing to pay a higher price to acquire their beloved IP (intellectual property) characters (Zhao & Xu, 2021).

2.2. Reviews on Risk Aversion

Risk aversion had a positive moderating effect on repurchase intention to a certain extent. This means that when consumers trust the brand more, their risk aversion may be reduced, increasing their repurchase intention. There is a negative relationship between Internet addiction and repurchase intention. However, the moderating effects of intrinsic motivation, brand trust, and risk aversion can moderate this negative relationship. This suggests that although addiction may generally inhibit repurchase intention, consumers with higher risk aversion may show stronger repurchase intention when these consumers hold higher trust (Havrilko, 2016).

Holt and Laury (2002) found that people become more risk-averse as actual rewards increase. This suggests that in real life, people who fear risk are more likely to make repeat or habitual purchases because they feel that the risks and rewards associated with these purchases are visible. Researchers believe risk aversion is an essential behavioural factor affecting economic decision-making. Sometimes, an individual's avoidance of risk can lead them to make repeat purchases (Harrison & Rutström, 2008). The observed behaviour suggests that people who fear risk may prefer frequent, predictable purchases because this certainty gives them peace of mind, rather than choosing options that may bring higher rewards but with uncertain outcomes. This preference for certainty may drive their repeated purchasing behaviour and ultimately lead to addiction (Simonsohn, 2009).

H1: Risk aversion have negative impacts on shopping addiction of toy blind boxes.

2.3. Reviews on Loss Aversion

The research shows that people fear losses when their goals are critical. Therefore, when individuals believe their goals are essential, their sensitivity to potential losses increases, making the loss aversion effect more pronounced in decisions involving these essential goals. This heightened sensitivity to loss may lead to more cautious and repetitive purchasing behaviour, especially in scenarios with high risk or high probability of loss. Over time, this cautious behaviour may evolve into a buying addiction (Wicker et al., 1995).

When consumers are faced with default options, if not accepting these options would be perceived as a loss, they are likely to stick with these default options to avoid the perceived loss. This behaviour may lead to repeated purchases or addiction, especially in cases where changing the default option requires cognitive or financial costs (Brown & Krishna, 2004). If consumers show loss aversion, they may make more frequent purchases to reduce potential losses. For example, in cases where purchases can prevent perceived losses (such as missing out on promotions or product discontinuation), loss aversion may drive repeated and compulsive purchases (Chen et al., 2024).

When buying blind boxes, people do not know what is inside the box before opening it. Consumers who experience loss aversion may buy more blind boxes to avoid the regret of not getting the desired item. The phenomenon observed in blind box purchases, repeated purchases to avoid the disappointment of not receiving the desired item, is a direct manifestation of loss aversion. Avoiding the negative emotions caused by not getting the preferred item motivates consumers to continue purchasing in the hope of obtaining a different outcome (Karle et al., 2015).

H2: Loss aversion have negative impacts on shopping addiction of toy blind boxes.

2.4. Reviews on Ambiguity Aversion

Ambiguity aversion is distinct from risk aversion. It is characterized by discomfort with unknown outcomes and can drive consumers to make repeated purchases within familiar contexts to minimize uncertainty (Belissa et al., 2020). This behaviour manifests as a preference for familiar products or brands where the outcomes are more predictable, thereby reinforcing the addiction cycle (Liu, 2011). Consumers with higher ambiguity aversion are likely to engage in repetitive purchasing behaviours to avoid the discomfort associated with uncertainty, further intensifying the addictive nature of blind box consumption.

In the context of blind boxes, the combination of high outcome and probability uncertainty can lead to increased buying behaviours driven by the psychological reward mechanisms associated with overcoming the initial aversion to ambiguity. The study suggests that while ambiguity aversion typically discourages risk-taking, it can paradoxically increase purchase behaviour when linked with high sensation-seeking and favourable conditions of uncertainty. This dynamic can lead consumers to repetitively engage with products that provide uncertain but potentially gratifying outcomes, reinforcing addictive purchasing patterns (Zhang, 2022). Trautmann et al. (2011) show that when compounded by loss aversion, ambiguity aversion might lead to stronger preferences for less ambiguous, more predictable purchasing options. The ambiguity involved in blind box purchases might appeal to ambiguity-averse consumers, as each purchase reduces the uncertainty by revealing the contents, potentially leading to repeated purchases to mitigate the discomfort associated with not knowing the outcome.

H3: Ambiguity aversion have negative impacts on shopping addiction of toy blind boxes.

2.5. Reviews on Social Environment

The connectivity and immediacy of social media amplify peer influences, which can encourage conforming purchasing behaviours that mimic those of peers. Peer groups play a significant role in shaping materialistic values among young adults, impacting compulsive buying behaviours. The study highlights that peer influence, through direct interactions and social learning, strongly correlates with higher levels of materialism and increased compulsive purchasing. Peer influence, social media marketing, and cultural trends collectively enhance materialistic values among young adults, increasing their susceptibility to compulsive buying behaviours. This relationship is particularly evident in social media, where celebrity endorsements and peer interactions converge to influence young consumers' purchasing decisions (Islam et al., 2017).

Peer interaction on social media platforms like Instagram, Twitter, and Tiktok, where influencers showcase their blind box collections through unboxings and reviews, significantly impacts consumer behaviour. Blind boxes have become popular culture, particularly in regions heavily influenced by East Asian pop culture trends. The act of collecting is seen not just as a personal hobby but also as a social investment, making it a trendy and culturally significant activity (Wang & Huang, 2021).

Social media is a powerful medium in this process by showcasing trends and promoting products through tailored advertisements and influencer endorsements. Additionally, there might be a greater focus on personal image and brand association, aspects that social media marketing significantly amplifies. These cultural trends, heavily propagated through social media can affect buying behaviours, leading to an increase in compulsive purchases (Mishra & Maity, 2021).

H4: Social environment including Peer influence, social media and cultural trends have positive impacts on shopping addiction of toy blind boxes.

2.6. Reviews on Economics Incentive

Sales promotions, such as discounts, coupons, and special offers, play a critical role in influencing consumer purchase decisions. Price is discussed as a major determinant of consumer behavior. Competitive pricing combined with the perceived value of the product can lead to increased consumer interest and repeated purchases. High perceived value can enhance consumer satisfaction and loyalty, potentially leading to repeated purchases and, over time, to buying addiction if consumers continuously perceive high value in new or existing products (Kuncoro & Kusumawati, 2021). Moreover, when promotions are perceived as significant, they not only increase immediate purchase intentions but also condition consumers to respond more positively to similar promotions in the future, reinforcing the cycle of buying (Chen et al., 1998).

H5: Economics incentive including Promotions, prices and perceived value have positive impacts on shopping addiction of toy blind boxes.

3. RESEARCH METHODOLOGY

The first objective of this study is to examine the factors and personal characteristics that influence consumers' blind boxes purchase, emphasizing the role of economic incentives, social environment, risk aversion, loss aversion and ambiguity aversion. So, this objective of study will use simple binary logit model (Harrell, 2015). The second objective is focusing on the utilize the Shopping Addiction Scale to quantitatively measure the extent of shopping addiction related to blind box buying. In this objective will be use descriptive statistics of Shopping Addiction Scale for blind box purchase. Calculate the mean, standard deviation, minimum, maximum, and frequency distribution for each dimension of the BSAS. Use these statistics to describe the central tendency, dispersion, and overall distribution of shopping addiction scores. The Last objective of this study is to examine the factors and personal characteristics that influence blind boxes addition. This step will use ordinary least squares (OLS) regression to analyze the impact of each independent variable on the degree of toy blind box shopping addiction (Burton, 2021). It can help determine and quantify the contribution of different factors (such as economic incentives, product characteristics, market environment, etc. to shopping addiction.

3.1. The Population / Sample Group

The study population includes a total of 400 samples will be collected for analysis, with 100 questionnaires distributed per city (China's first-tier cities, specifically selecting Beijing, Shanghai, Guangzhou, and Shenzhen). With an age range of 15 to 43 years old (including generation Y and Z group people, to facilitate comparative analysis).

3.2. Research Instrument

A questionnaire was used to collect data, and quantitative analysis will apply to interpret the data. Consider conducting the study in four major first-tier cities in China (Beijing, Shanghai, Guangzhou and Shenzhen) to ensure the representativeness of the sample and the wide applicability of the research results.

3.3. Data Collection

To ensure the accuracy and relevance of the survey data, this study plans to collect data through an online questionnaire. The online questionnaire platform used is available at http://www.wjx.cn/. This platform allows users to create, publish, and gather responses for surveys.

3.4. Reliability and Validity

Reliability means that the same observation results can be obtained when a method is used to repeatedly measure the object. We use the α reliability coefficient method (Cronbach α). α values between 0.60-0.65 are considered average, between 0.65-0.70 are considered acceptable, between 0.70-0.80 are considered good, and between 0.80-0.90 are considered very good. In this questionnaire survey, when the total scale reliability reaches 0.7 (0.78), it means that the questionnaire measurement results are stable. The KMO and Bartlett sphericity test data of this questionnaire show that the KMO value is 0.910, indicating that the construct validity of the questionnaire is good.

3.5. Data Analysis

The results show that the mean value of Addiction is 0.648, indicating that 64.8% of the samples prefer blind boxes, and the mean value of Scale is 3.197, indicating that overall, the addiction level of the respondents to blind boxes is at an average level, which also ensures the representativeness of the sample. The means of the five explanatory variables are all between 3.2 and 3.3, which is at an average level. The mean value of Age is 29.979, indicating that the average age of all respondents is 29.979 years old, and the mean value of Female is 0.655, indicating that 65.5% of the respondents are female.

4. RESEARCH RESULTS

4.1. Descriptive Statistics

Table 1: Basic Information of Respondents

Basic Information	Item	Frequency	Percentage(%)
Gender	Male	163	34.53

Basic Information	Item	Frequency	Percentage(%)
	Female	309	65.47
Total		**472**	**100.00**
Age	18-35(Z)	310	65.68
	35-43(Y)	162	34.32
Total		**472**	**100.00**
Income (monthly)	Below 2000 yuan	30	6.36
	2001-5000 yuan	89	18.86
	5001-10000 yuan	171	36.23
	More than 10001 yuan	182	38.56
Total		**472**	**100.00**
Education background	Junior high school and below	0	00.00
	High School	43	9.11
	Junior College	117	24.79
	University undergraduate	203	43.01
	Postgraduate and above	109	23.09
Total		**472**	**100.00**
City	Beijing	103	21.82
	Shanghai	100	21.19
	Guangzhou	105	22.25
	Shenzhen	164	34.75

Basic Information	Item	Frequency	Percentage(%)
Total		**472**	**100.00**
How many times of Art IP toy blind boxes were purchased in last 12 months?	Below 20	92	19.49
	21-50	137	29.03
	51-80	161	34.11
	More than 81	82	17.37
Total		**472**	**100.00**
How many times of Art IP toy blind boxes were purchased in last 12 months?	Below 20	82	17.37
	21-50	139	29.45
	51-80	163	34.53
	More than 81	88	18.64
Total		**472**	**100.00**
Preference	normal toys	163	34.53
	Blind box toy	309	65.47
Total		**472**	**100.00**

Table 1 provides a basic information of the samples. From the data, we can see that in the survey sample, there are 34.53% males and 65.47% females. Generation Z (18-35 years old) accounts for 65.68%, and Generation Y (35-43 years old) accounts for 34.32%. The income of more than 10,001 yuan is the largest, accounting for 38.56%. The population with a university undergraduate education background accounts for 43.01, ranking first. The number of people who bought blind box toys and ordinary toys 51-80 times in the past year accounted for the largest proportion, 34.11% and 34.53% respectively. Among the 472 people, 309 people like blind box toys.X

Table 2: The mean and standard deviation (S.D.) of Variables (n=472)

Dimension	Mean	SD	Min	Median	Max
Addiction	0.648	0.478	0	1	1
Scale	3.197	0.541	1.286	3.214	4.714
Risk	3.258	1.116	1	3.8	5
Loss	3.256	1.112	1	3.8	5
Ambiguity	3.233	1.1	1	3.6	4.8
Social	3.25	1.083	1	3.667	4.667
Econ	3.285	1.121	1	3.833	4.833
Age	29.979	7.303	18	29	43
Income	8.879	0.616	7.313	9.06	9.616
Female	0.655	0.476	0	1	1
Edu	3.801	0.897	2	4	5

Table 2 outlines the mean value of Addiction is 0.648, indicating that 64.8% of the samples prefer blind boxes, and the mean value of Scale is 3.197, indicating that overall, the addiction level of the respondents to blind boxes is at an average level, which also ensures the representativeness of the sample. The means of the five explanatory variables are all between 3.2 and 3.3, which is at an average level. The mean value of Age is 29.979, indicating that the average age of all respondents is 29.979 years old, and the mean value of Female is 0.655, indicating that 65.5% of the respondents are female. Table 3 shows the logit model results and Table 4 shows the results of OLS Model regression. Equation 1 shows log and logit performance model whereas Equation 2 shows average shopping addiction score below.

$$Log\left[\frac{P_i}{(1-P_i)}\right] = logit\,(P(Y=1)) = \beta_0 + \beta_1 RA + \beta_2 LA + \beta_3 AA + \beta_4 SE + \beta_5 EI + \beta_6 Age + \beta_7 Gender + \beta_8\, Income + \beta_9\, Education\ \#\ (1) \quad (1)$$

Table 3: The Logit Model results

VARIABLES	(1) Addiction	(2) Addiction
Risk	-0.7195***	-0.6661***
	(0.2481)	(0.2531)
Loss	-0.4931**	-0.5108**
	(0.2429)	(0.2476)
Ambiguity	-0.6872***	-0.7270***
	(0.2503)	(0.2571)
Social	0.5772**	0.5639**
	(0.2672)	(0.2712)
Econ	0.0299	0.0422
	(0.2498)	(0.2541)
Age		-0.0337**
		(0.0153)
Income		0.1056
		(0.1778)
Female		0.5644**
		(0.2342)
Edu		0.1755
		(0.1247)

Constant	5.1625***	4.2366**
	(0.6587)	(1.8041)
Observations	472	472
Pseudo R2	0.197	0.217
LR chi2	120.3***	132.8***

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

$$Average\ Shopping\ addiction\ score = \beta_0 + \beta_1 \cdot Risk\ Aversion + \beta_2 \cdot Loss\ Aversion + \beta_3 \cdot Ambiguity\ Aversion + \beta_4 \cdot Social\ Environment + \beta_5 \cdot Economic\ Incentives + \epsilon\ \#(2) \quad (2)$$

Table 4: The OLS Model regression results

	(1)	(2)
Variables	**Scale**	**Scale**
Risk	-0.1607***	-0.1504***
	(0.0501)	(0.0497)
Loss	-0.1199**	-0.1208**
	(0.0476)	(0.0471)
Ambiguity	-0.1375***	-0.1403***
	(0.0494)	(0.0490)
Social	0.3047***	0.3034***
	(0.0525)	(0.0519)
Econ	0.3082***	0.3073***

	(0.0508)	(0.0504)
Age		-0.0090***
		(0.0029)
Income		-0.0435
		(0.0344)
Female		0.1063**
		(0.0449)
Edu		-0.0113
		(0.0236)
Constant	2.5529***	3.1676***
	(0.0696)	(0.3335)
Observations	472	472
R-squared	0.2723	0.2970
F value	34.87***	21.69***

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 5: The Multicollinearity test results

Variable	**VIF**	**1/VIF**
Econ	7.180	0.139
Social	7.100	0.141
Risk	6.910	0.145
Ambiguity	6.530	0.153

Loss	6.180	0.162
Female	1.030	0.972
Income	1.010	0.991
Edu	1.010	0.992
Age	1.010	0.992
Mean VIF	4.220	

From the results that shown in Table 5, we can see that according to the results, the VIF of all variables does not reach 10 or above, so there is no multicollinearity problem.

5. DISCUSSION

The results of Logit model shows that, when other variables are controlled unchanged, the coefficient of Risk Aversion is -0.6661, which is significant at the 1% level, indicating that Risk Aversion has a significant inhibitory effect on the respondents' choice of blind boxes, that is, as Risk Aversion increases, the samples' preference for blind boxes will decrease; the coefficient of LossAversion is -0.5108, which is significant at the 5% level, indicating that Loss Aversion has a significant inhibitory effect on the respondents' choice of blind boxes, that is, as Loss Aversion increases, the samples' preference for blind boxes will decrease; the coefficient of Ambiguity Aversion is -0.7270, which is significant at the 1% level, indicating that Ambiguity Aversion has a significant inhibitory effect on the respondents' choice of blind boxes, that is, as Ambiguity Aversion increases, the samples' preference for blind boxes will decrease; the coefficient of Social Environment is 0.5639, which is significant at the 5% level, indicating that Social Environment has a significant promoting effect on the respondents' choice of blind boxes, that is, as Social Environment increases, the samples' preference for blind boxes will decrease. As the Environment increases, the sample's preference for blind boxes will increase; the coefficient of Economic incentive is insignificant, indicating that Economic incentive has no significant effect on the blind box preference of the interviewed samples.

In terms of control variables, the coefficient of Age is significantly negative at the 5% level, indicating that age has a significant inhibitory effect on blind box preference, and the coefficient of Female is significantly positive at the 5% level, indicating that women prefer blind boxes more than men.

The results of OLS regression show that, when other variables remain unchanged, the coefficient of Risk Aversion is -0.1504, which is significant at the 1% level, indicating that Risk Aversion has a significant inhibitory effect on the degree of blind box purchase addiction, that is, for every 1 point increase in Risk Aversion, the blind box purchase addiction score decreases by 0.1504 points; the coefficient of Loss Aversion is -0.1208, which is significant at the 5% level, indicating that Loss Aversion has a significant inhibitory effect on the degree of blind box purchase addiction,

that is, for every 1 point increase in Loss Aversion, the blind box purchase addiction score decreases by 0.1208 points; the coefficient of Ambiguity Aversion is -0.1403, which is significant at the 1% level, indicating that Ambiguity Aversion has a significant inhibitory effect on the degree of blind box purchase addiction, that is, for every 1 point increase in Ambiguity Aversion, the blind box purchase addiction score decreases by 0.1403 points; Social The coefficient of Environment is 0.3034, which is significant at the 1% level, indicating that blind box purchase addiction has a significant promoting effect, that is, for every 1 point increase in Social Environment, the blind box purchase addiction score increases by 0.3034 points; the coefficient of Economic Incentives is 0.3073, which is significant at the 1% level, indicating that blind box purchase addiction has a significant promoting effect, that is, for every 1 point increase in Economic Incentives, the blind box purchase addiction score increases by 0.3073 points.

6. CONCLUSION

This study used the Logit model and OLS regression to test the results. It can be seen from the results that loss aversion, risk aversion, and ambiguity aversion all have a negative effect on blind box purchase addiction; this shows that people have a strong sense of aversion when facing risks, losses, and products with strong ambiguity, and people are still rational, which is in line with the basic principles of traditional economics. The social environment meets the hypothesis in the two models and has a positive effect on the purchase addiction of toy blind boxes; this shows that people have a strong desire to buy blind boxes in the context of peers, social media, and publicity, which is also prone to purchase addiction problems. In order to pursue trends and have common topics and hobbies when communicating with peers, the purchase of toy blind boxes has increased. However, economic incentives have different performances in the two models: the positive impact of economic incentives on toy blind box purchase addiction in the logit model is insignificant; in the OLS regression model, economic incentives positively impact toy blind box purchases.

The basic personal information shows that those who like to buy blind boxes are still mainly women, as high as 65.47%. The fact that Generation Z is still the "main force" in buying blind boxes further proves the different consumption concepts of Generation Z mentioned above. From the perspective of educational background, people with Junior College, University undergraduate, and postgraduate backgrounds are all high-level intellectuals, which means that no matter how high or low their education level is, they will be attracted by blind boxes and buy them after trying them, which has become a habitual purchasing behaviour. Whether it is buying blind boxes or regular toys, some respondents have purchased more than 81 times in the past year, with an average of 7 times per month, indicating that everyone has a great interest in toys (whether in the form of blind boxes or non-blind boxes). However, in comparison, the respondents still prefer toy blind boxes because they can follow the trend, enjoy the process of opening blind boxes, and have the idea of collecting a complete set. Although blind boxes provide fun for everyone after work and life, they should also consume rationally, arrange personal expenses reasonably, and avoid addiction.

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Factors Determining the Behavior Intention to Use Traditional and Livestream E-commerce Platforms in China: The Unified Theory of Technology Acceptance Framework

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ABSTRACT

The rapid evolution of e-commerce in China, particularly through the rise of live streaming e-commerce alongside traditional platforms, has dramatically reshaped the commercial landscape. This paper delves into the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), revealing its profound impact on user behavior intentions and the intricate dynamics of the e-commerce market. By applying UTAUT2 and complementary theories, we investigate how diverse factors influence consumers' intentions across various e-commerce platforms. Adopting a user-centric approach, this research uncovers the shifting role of consumers and the ways different e-commerce models cater to their shopping behaviors and preferences. Our findings illuminate how UTAUT2 governs user choices and actions in this competitive arena, ultimately affecting the growth and rivalry among e-commerce platforms. This study not only enhances our understanding of the technological, behavioral, and market interconnections within the rapidly changing e-commerce sector but also contributes significantly to the ongoing discourse on commercial evolution within China's flourishing digital economy.

Keywords: E-commerce Platform Comparison, UTAUT2 Model, Traditional E-commerce(Taobao, JD.com), New E-commerce(DouYin), Consumer Behavior Intention

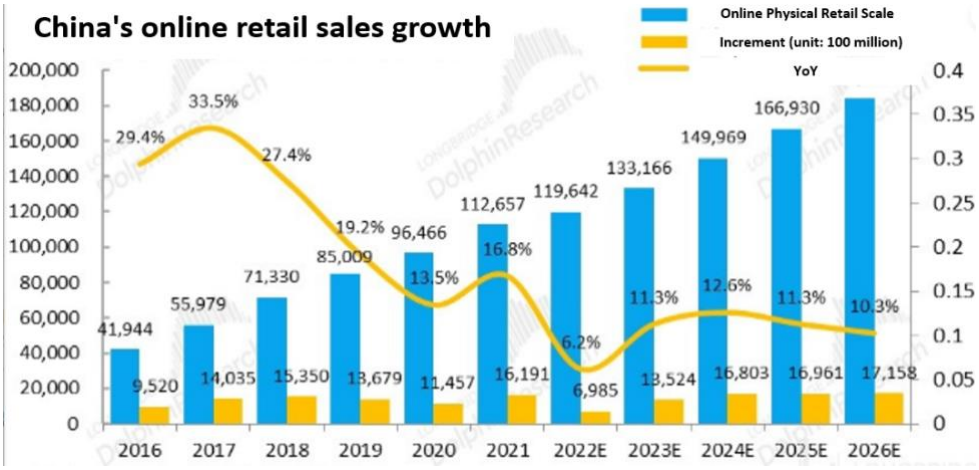
1. INTRODUCTION

China is the largest e-commerce market globally, accounting for nearly 50 percent of the world's transactions. According to e-Marketer, China's online retail transactions exceeded 710 million digital buyers, and the total transactions reached $2.29 trillion in 2020, with forecasts projecting it to reach $3.56 trillion by 2024. In 2021, China surpassed the United States to become the largest e-commerce market, generating revenue of $1.5 trillion (Powell, 2022).

Analysts have calculated that during the four years from 2023 to 2026, the core growth rate of online physical retail will be 11.4%. The lowest growth rate is projected to be 3.20% in 2023, slightly higher than in 2022. Even though they anticipate online retail growth will stabilize after the epidemic, it will not experience acceleration. Starting in 2024, the absolute growth of online

retail sales will reach an all-time high every year. This indicates that the online retail still possesses significant incremental growth potential (Dolphin Research, 2023).

Based on the analysis above, it can be observed that the central growth rate of online retail sales in the future is likely to remain around 10%. Furthermore, considering consumers' return to offline shopping in 2023, the annual growth rate of online retail sales in the next few years is expected to be around 1.6% to 1.7 trillion yuan. Figure 1 illustrates China's online retail sales growth below.



However, the emergence of the rapidly growing live e-commerce sector is competing for the limited incremental growth of the e-commerce market. This implies that the market shares of traditional e-commerce, especially the leading player Alibaba, are facing erosion (Dolphin Research, 2023).

Figure: 1 China's online retail sales growth. Source: Long Bridge Dolphin Investment Research Compilation (Dolphin Research, 2023).

This study is grounded in the theoretical framework of the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), which aims to standardize the terminology used in various technology acceptance models and theories. UTAUT2 comprises four key constructs influencing user behaviour and intention to use technology. These constructs are fundamental when exploring technology adoption, including the well-known Technology Acceptance Model (TAM) by Davis (1986), the Unified Theory of Acceptance and Use of Technology (UTAUT) introduced by Venkatesh et al. (2003), and the more recent UTAUT2 proposed by Venkatesh et al. (2012). These models have been extensively applied in research concerning adopting e-commerce and mobile payment solutions.

This study draws upon UTAUT2, a framework that standardizes terminology and incorporates four key constructs. It also acknowledges the foundational contributions of TAM, UTAUT, and UTAUT2 in the realm of technology adoption, particularly in the context of e-commerce and mobile payment solutions.

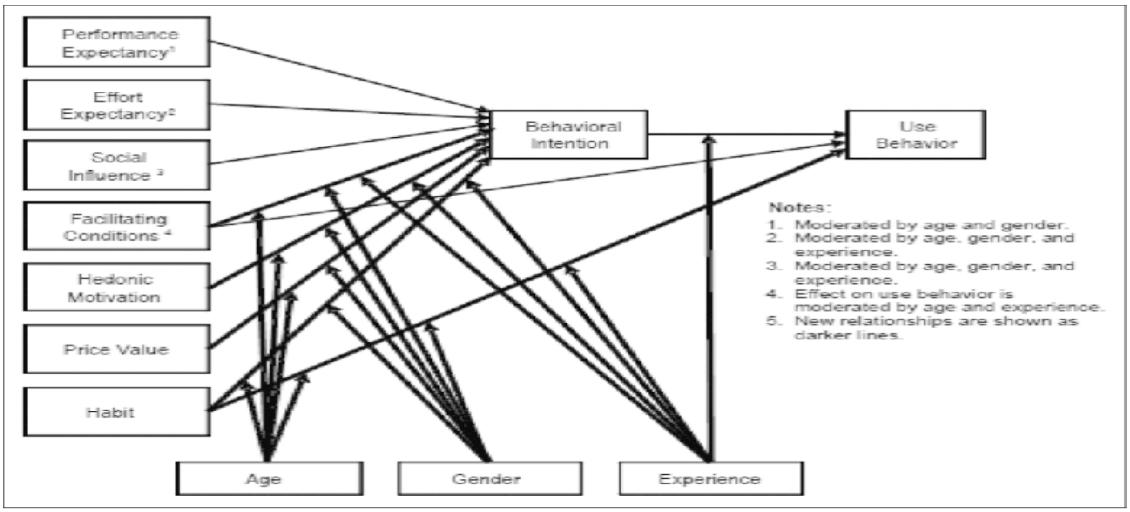


Figure 2: UTAUT2 model

Figure 2 illustrates the UTAUT2 model above; UTAUT2 outperforms TAM and UTAUT in predicting user behaviour, with the direct effect hypothesis explaining a substantial portion of the variance in behavioural intent and technology usage. To enhance this study's questionnaire, the researcher intends to integrate determinants from both UTAUT2 and TAM (Venkatesh et al., 2012).

In addition to these core theories, various factors impact consumers' intentions to adopt mobile payment systems. Factors such as subjective norms, ease of use, usefulness, attitude, and security influence adoption (Liébana-Cabanillas et al., 2017). Additionally, significant drivers are significant drivers of performance expectancy, effort expectancy, social influence, facilitating conditions, habit, price value, hedonic motivation, risk perception, and trust (Slade et al., 2015). Furthermore, mobile banking app usage correlates with low-risk perception, high compatibility, ease of use, and usefulness. At the same time, non-use is associated with low compatibility, limited usefulness, ease of use, and high-risk perception (Veríssimo, 2016).

1.1. Definition

1.1.1. What is Traditional E-Commerce Platform?

Traditional e-commerce is a business model that uses Internet platforms for online transactions, including different models such as B2B, B2C, C2C and O2O. Traditional e-commerce provides a

convenient shopping experience, allowing consumers to browse products, compare prices and place orders at any time, while ensuring timely delivery of goods through logistics cooperation. The core elements of traditional e-commerce include e-commerce platforms, consumers, products and logistics, which promote job opportunities, financial savings, and enhance re-transaction and repurchase rates (MS, 2021).

1.1.2. Living Streaming E-Commerce Platform：DouYin

Live streaming e-commerce combines live streaming with e-commerce to display, promote, and sell products through live streaming, thereby achieving sales targets and increasing turnover. Through live broadcast display, consumers can get more intuitive and comprehensive product information, and the anchor can try it out and explain it in detail, which helps stimulate consumers' desire to buy and increase sales. Live e-commerce provides consumers with the opportunity to interact with anchors, allowing them to obtain a more personalized and authentic shopping experience, improving consumer satisfaction. Table 1 shows the traditional e-commerce platform vs living streaming e-commerce.

Table 1: Traditional e-commerce platform VS Living streaming e-commerce

Traditional e-commerce platform： **TaoBao & JD.com**		**VS**	**Living streaming e-commerce platform：DouYin**
TaoBao： 1. E-commerce type： Traditional e-commerce 2.Selling chanel: Online website selling 3. Types of goods: variety of products	**JD.com：** 1. E-commerce type： Traditional e-commerce 2.Selling chanel: Online website selling 3. Types of goods:		**DouYin** 1. E-commerce type： New e-commerce 2.Selling chanel: Living streaming and application page selling 3. Types of goods: variety of products

	Prefer to sell furniture and appliances		

Table 2: Comparison perspectives of Traditional e-commerce and new e-commerce

Difference	**Taobao**	**JingDong**	**DouYin**
Product Types	Comprehensive e-commerce platform	Home appliances, digital households and other large furniture	Comprehensive e-commerce platform
User properties	Age between 20-35 (Focus on fashion and personality)	Age between 20-35 (focus on quality and service)	Age between 15-65 (focus on short videos and live broadcasts)
Marketing	Web marketing festival discounts (“Double 11”, “618”), entry of big brands, celebrity endorsements	Web marketing, festival discounts (“Double 11”, “618”), entry of big brands, celebrity endorsements	Live broadcast and short video sales, “window sales” (Ps: Douyin version of web marketing), star llive broadcast and endorsements
Content form	Traditional e-commerce platforms have	Traditional e-commerce platforms have	A new type of e-commerce platform with strong social attributes

	relatively weak social attributes	relatively weak social attributes	
Social attributes	The content is mainly in the form of pictures and texts	The content is mainly in the form of pictures and texts	Short video, live broadcast, pictures and texts

In terms of product offerings, Taobao and Douyin share similar ways of providing enjoyment to their users, whereas JD.com specializes in household appliances and domestic items. Table 2 above shows the comparison perspective of traditional e-commerce and new e-commerce. Based on the summary of chart 1 mentioned above, it's evident that the user demographic for Taobao and JD.com is broader than that of Douyin. This is because Douyin primarily disseminates information through video and live streaming, enabling consumers to easily discover and purchase what they need (Artificial Intelligence Dream Chaser, 2023).

"Double 11" and "618" correspond to promotional events for Taobao and JD.com in China, attracting online shoppers to spend on these specific days. However, Douyin distinguishes itself by offering live streaming and nurturing "Douyin Stars," who often have more followers than many traditional Chinese celebrities. Leveraging the "star effect" and substantial endorsement fees, Douyin invites renowned products and celebrities to join the platform, resulting in consistent year-over-year growth in sales (Artificial Intelligence Dream Chaser, 2023).

1.2. Research Objective

1. Examine factors determining the behavior intention to use the livestream/ traditional e-commerce platform (livestreaming e-commerce platform: DouYin/traditional e-commerce platform:T aoBao and JingDong).

2. Compare consumers' usage behavior of livestream e-commerce platform (DouYin) and the traditional e-commerce platforms (TaoBao and JingDong).

3. Compare factors determining the behavior intention to use the livestream e-commerce platform (DouYin) and the traditional e-commerce platforms (TaoBao and JingDong).

1.3. Advantages of the Study

This article uses UTAUT2 as the theoretical model. Compared with the former research, the research direction has more factors that can be used and studied. Secondly, living streaming e-commerce has become a very popular shopping method in China. People's shopping habits are no longer just shopping on the web. The fun and interactivity brought by living streaming far exceeds that of traditional e-commerce.

By employing the UTAUT model and questionnaire analysis, investigate factors that attract users to platforms like Douyin. This aids enterprises in understanding consumer needs and enables targeted marketing strategies to enhance influence on platforms such as Douyin.

Explore creative digital marketing methods utilizing user-generated content and personalized recommendations to enhance user experience and attract potential customers.

1.4. Scope of the Study

This paper will predict and analyze the main reasons for behavioral intentions from the analysis framework of 8 variables: Performance Expectation, Effort Anticipation, Social influence, Hedonic motivation, Price value, Habits, Support conditions and Behavioral intention. Figure 3 illustrates the conceptual framework of new e-commerce platform and traditional e-commerce platform below.

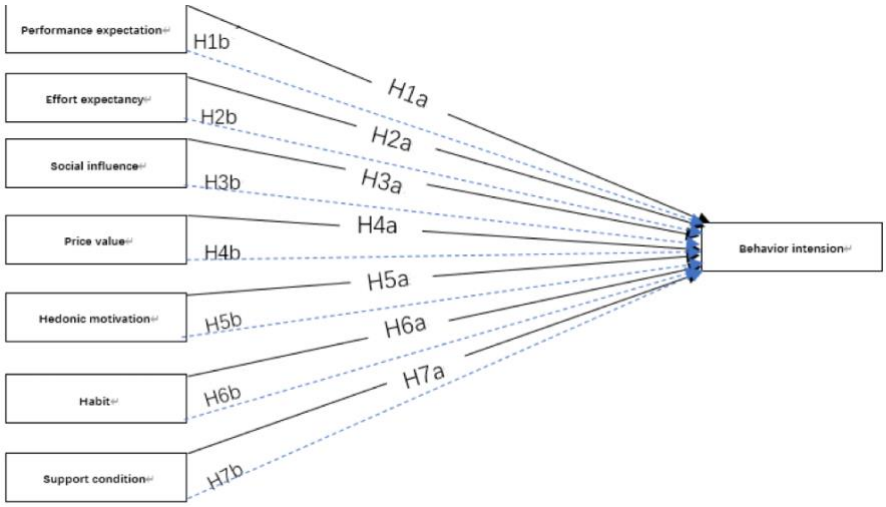


Figure 3: Conceptual Framework of new e-commerce platform and traditional e-commerce platform

2. LITERATURE REVIEW

2.1. Analyzing Factors Affecting Users' Behavior Intention to Use Social Media: Twitter Case

Technological advancements and internet penetration have had a significant impact on the world, one of which is the increased widespread use of social media. We studied the factors that influence people's willingness to use social media. Through surveys and data analysis, we found that these factors have a positive impact on users' behavioral intentions. In summary, technology and the Internet have changed the way social media is used.

Akar and Mardikyan's 2014 study employed the Technology Acceptance Model (TAM) to examine the determinants affecting users' desire to utilize social media, with a particular emphasis on Twitter as a case study. Structural Equation Modeling (SEM) was utilized as the empirical approach to evaluate their hypotheses. The principal findings indicated that perceived ease of use, perceived utility, and trust directly influenced users' propensity to utilize Twitter. Moreover, social influence, playfulness, and favorable settings were identified as indirect determinants of behavioral intention, indicating a comprehensive framework for comprehending social media adoption.

2.2. Analysis of Behavioral Intentions of E-Commerce Shopee's Users in Indonesia Using UTAUT2

Setyani et al. (2023) conducted a study using the unified theory of acceptance and use of technology 2 (UTAUT2) to analyse the behavioral intentions of e-commerce shopee users in Indonesia using UTAUT2. Lam's formulation was employed as the emperical approach to evaluate their hypotheses. The finding shows that social factors and habits have a significant positive impact on the behavioral intentions of Shopee e-commerce users. Moreover job expectations, business expectations, facilitating conditions, hedonic motivations, and price do not have a significant positive impact on users' behavioral intentions.

Shoppe e-commerce is gaining popularity among the public due to its various benefits, creating an opportunity for businesses to expand their marketing efforts. To seize this opportunity, business owners must understand the factors influencing shopees' intentions when using Shopee. This study aims to identify these factors, which are part of the UTAUT2 model: performance expectations, social impact, supportive conditions, hedonic motivations, price value, and habits. Data was collected from 152 Shopee users in Indonesia via a survey.

The findings reveal that social factors and habits positively and significantly impact shoppers' behavioral intentions on Shopee. However, job expectations, business expectations, framework conditions, hedonic motives, and price have no significant effect on these intentions. This information empowers businesses to create engaging promotions based on social factors and habits, such as Shopee's live ads. These results can also inform Shopee's e-commerce feature development.

2.3. Age in the Acceptance of Mobile Social Media: A Comparison of Generation Y and Baby Boomers Using UTAUT2 Model

In Vasudeva (2023) study, the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) framework was employed to examine age-related differences in the acceptance of mobile social media among Generation Y and Baby Boomers. The study used Structural Equation Modeling (SEM) as the empirical method to analyze the data. The key findings revealed significant variations between the two age groups, particularly in the factors influencing their acceptance of mobile social media. Effort expectancy, facilitating conditions, and hedonic motivation were found to have different levels of impact on the younger and older generations, highlighting the need for age-specific approaches when assessing technology acceptance.

This paper explores age-related differences in how consumers accept mobile social media. It compares Generation Y (young) and Baby Boomers (elderly) using the UTAUT2 model. The study

surveyed 249 people in Punjab, India, and used multi-group path analysis with SEM. The results show that young and elderly groups differ in their views on effort expectancy, facilitating conditions, hedonic motivation's effect on intention, and facilitating conditions' impact on usage behavior. This has implications for future research in internet marketing and mobile social media. Questionnaire development shows in Table 3.

3. RESEARCH METHODOLOGY

Table 3: Questionnaire development

PE	**Question**	**References**
1.	Douyin e-commerce platform is useful for my online shopping	(Setiyani et al., 2023) (China Lifestyle Marketing, 2023)
2.	Traditional e-commerce platform is useful for my online shopping	
3.	Using DouYin e-commerce allows me to buy the products I like	
4.	Using traditional e-commerce allows me to buy the products I like	
5.	DouYin e-commerce allows me to buy higher quality products	
6.	Traditional e-commerce allows me to buy higher quality products	
7.	Shopping on DouYin e-commerce platforms can help me save time	(Gastel, 2023)
8.	Shopping on traditional e-commerce platforms can help me save time.	
The degree of intention to use: 1: strong disagree; 2: disagree; 3:natural; 4:agree; 5: strong agree		

EE	**Question**	**References**
9.	I am satisfied with the ease of using the Douyin e-commerce platform	
10.	I am satisfied with the ease of using the traditional e-commerce platform	

11.	I am satisfied with the simplicity of the payment process on the Douyin e-commerce platform	(MS, 2021)
12.	I am satisfied with the simplicity of the payment process on the traditional e-commerce platform	
13.	I am satisfied with the content of Douyin e-commerce platform, which is simple and easy to understand	(Gastel, 2023)
14.	I am satisfied with the content of traditional e-commerce platform, which is simple and easy to understand.	
15.	I am satisfied with how the Douyin e-commerce platform provides multilingual.	(MS, 2021)
16.	I am satisfied with how the traditional e-commerce platform provides multilingual.	
17.	I am satisfied with the personalized recommendations provided by the Douyin e-commerce platform	(Jiao, 2020)
18.	I am satisfied with the personalized recommendations provided by the traditional e-commerce platform	
The degree of intention to use: 1: strong disagree; 2: disagree; 3:natural; 4:agree; 5: strong agree		

SI	**Question**	**References**
19.	When shopping, I will recommend Douyin e-commerce platforms to my friends or family	(Adekoya, 2023)
20.	When shopping, I will recommend traditional e-commerce platforms to my friends or family	
21.	My friends are willing to use Douyin e-commerce platforms	
22	My friends are willing to use traditional e-commerce platforms	

23.	When I shop, I usually use the Douyin platform	(Rogers, 2003)
24.	When I shop, I usually use the traditional platform	
25.	I decided to use the Douyin e-commerce platform because of the great influence of its social celebrities	(Jiao, 2020)
26.	I decided to use the traditional e-commerce platform because of the great influence of its social celebrities	
The degree of intention to use: 1: strong disagree; 2: disagree; 3:natural; 4:agree; 5: strong agree		

P	**Question**	**References**
27.	For me, it is cheaper to buy goods on Douyin e-commerce platform	(China Lifestyle Marketing, 2023)
28.	For me, it is cheaper to buy goods on traditional e-commerce platform	
29.	For me, the authentic products purchased on the Douyin e-commerce platform are more	(Rogers, 2003)
30.	For me, the authentic products purchased on the traditional e-commerce platform are more	
31.	I am satisfied with the promotions on the Douyin platform.	(Al-Khasawneh et al., 2022)
32.	I am satisfied with the promotions on the traditional platform	
33.	I am satisfied with the high price transparency of the Douyin e-commerce platform	(Lingble, 2024)
34.	I am satisfied with the high price transparency of the traditional e-commerce platform.	
The degree of intention to use: 1: strong disagree; 2: disagree; 3:natural; 4:agree; 5: strong agree		

HM	Question	References
35.	When I shop, Douyin consumption is more satisfying	(Adekoya, 2023), (China Lifestyle Marketing, 2023)
36.	When I shop, traditional consumption is more satisfying	
37.	DouYin e-commerce platform makes me more willing to shop online	
38.	Traditional e-commerce platform makes me more willing to shop online	
39.	When I shop on Douyin e-commerce platform, I am satisfied with its novel shopping method	
40.	When I shop on traditional e-commerce platform, I am satisfied with its novel shopping method	
41.	I am satisfied with the strong interactivity of the Douyin e-commerce platform	(Daxue Consulting, 2023)
42.	I am satisfied with the strong interactivity of the traditional e-commerce platform	
The degree of intention to use: 1: strong disagree; 2: disagree; 3:natural; 4:agree; 5: strong agree		

HB	Question	References
43.	I used to shop more on the Douyin e-commerce platform	(Adekoya, 2023) (China Lifestyle Marketing, 2023)
44.	I used to shop more on the traditional e-commerce platform	
45.	I have developed the habit of using the Douyin e-commerce platform	
46.	I have developed the habit of using the traditional e-commerce platform	
47.	If I don't use Douyin e-commerce platform for e-commerce shopping, I am also satisfied with other e-commerce platforms.	

48.	If I don't use traditional e-commerce platform for e-commerce shopping, I am also satisfied with other e-commerce platforms.	(Setiyani et al., 2023)
49.	Shopping on the Douyin e-commerce platform has become part of my lifestyle	(Al-Khasawneh et al., 2022)
50.	Shopping on the traditional e-commerce platform has become part of my lifestyle	
The degree of intention to use: 1: strong disagree; 2: disagree; 3:natural; 4:agree; 5: strong agree		

SC	**Question**	**References**
51.	When I use the Douyin e-commerce platform, I have a clear purchasing purpose	(Guan, 2021)
52.	When I use the traditional e-commerce platform, I have a clear purchasing purpose	
53.	I have fully mastered the use of the Douyin e-commerce platform	
54.	I have fully mastered the use of the traditional e-commerce platform.	
55.	When I use the Douyin e-commerce platform, I can solve the problem immediately	(Setiyani et al., 2023)
56.	When I use the traditional e-commerce platform, I can solve the problem immediately	
57.	My payment system and process on the Douyin e-commerce platform is safe and convenient	(MS, 2021)
58.	My payment system and process on the traditional e-commerce platform is safe and convenient	

The degree of intention to use: 1: strong disagree; 2: disagree; 3:natural; 4:agree; 5: strong agree

BI	Question	References
59.	I intend to use the Douyin e-commerce platform	(Guan, 2021)
60.	I intend to use the traditional e-commerce platform	
61.	I will focus on using the Douyin e-commerce platform for shopping in the future	
62.	I will focus on using the traditional e-commerce platform for shopping in the future	
63.	I am satisfied with the shopping experience on the Douyin e-commerce platform, and I will continue to use it	(Lingble, 2024)
64.	I am satisfied with the shopping experience on the traditional e-commerce platform, and I will continue to use it	
65.	I am satisfied with the customer service quality of the Douyin e-commerce platform and will continue to use it	
66.	I am satisfied with the customer service quality of the traditional e-commerce platform and will continue to use it	
The degree of intention to use: 1: strong disagree; 2: disagree; 3:natural; 4:agree; 5: strong agree		

3.1. Data Collection

When we mention the regions with the most developed e-commerce, it must be Beijing, Shanghai, Guangzhou, Shenzhen in China. These four cities not only have a large population and a huge market scale, but also have rich talent resources and technology accumulation, attracting countless e-commerce companies and entrepreneurs to develop. Among them, Beijing and Shanghai, as domestic financial centers and cultural centers, have attracted a large number of cross-border e-commerce companies to settle in, and have become important nodes in China's e-commerce industry (Guan, 2021). According to the data, Shanghai has 24.76 million, Beijing has 21.84 million, Guangzhou has 18.73 million, and Shenzhen has 17.66 million as shown in equation 1 below (Zheng, 2023).

Shanghai + Beijing + Guangzhou + Shenzhen = 24,760,000 + 21,840,000 + 18,730,000 + 17,660,000 = 82,990,000 (1)

In this paper, they create a questionnaire is based on the above dependent variables and independent variables, as well as questions created after the hypotheses raised. The number of surveys should be calculated by the Taro Yamane sample size formula (Umar & Wachiko, 2021). Taro Yamane sample size formula is shown in equation 2 below.

$$n = \frac{N}{K+N(e)^2} \quad (2)$$

N= Population of Beijing, Shanghai, Guangzhou, Shenzhen=82,990,000

K= Constant(1)

e= Degree of error expected(0.05)

n= Sample

Taro Yamane sample size formula of Beijing, Shanghai, Guangzhou, Shenzhen (the 4 cities with the most developed e-commerce in China) is shown in equation 3 below.

$$n = \frac{82990000}{1+82990000(0.05)^2} \quad (3)$$

n=399.9980720661666≈400

This article developed a questionnaire for 400 people based on the dependent and independent variables, and 100 persons for each city. as well as questions created after formulating hypotheses. Questionnaire production webpage: https://www.wjx.cn/.

The question answering method consists of 5 choices of 1 (very unwilling), 2 (unwilling), 3 (neutral), 4 (willing) and 5 (very willing) to express the user's response to different questions. So I can collect and analyze intension behavior after finally getting information feedback.

3.2. Factor Determining the Behavior Intention to Use the E-Commerce Platform

Objective 1 of this study are to examine factors determining the behavior intention to use the new e-commerce platform DouYin and the traditional e-commerce platforms TaoBao and JingDong. To estimate the effects of the factors, this study uses the multiple linear regression model as follows in equation 4.

$$BI_i^j = \beta_0^j + \beta_1^j PE_i + \beta_2^j EE_i + \beta_3^j SI_i + \beta_4^j P_i + \beta_5^j HM_i + \beta_6^j H_i + \beta_7^j SC_i + \epsilon_i^j. \quad (4)$$

For the dependent variable, BI_i^j is behavior intention of individual i to use the e-commerce platform j, where $j = \{NEW, TRAD\}$ are the new e-commerce platform and traditional e-commerce platform. For the independent variables, PE_i is performance expectation, EE_i is the effort

expectation, SI_i is the social influence, P_i is the price, HM_i is Hedonic Motivation, H_i is the habit, SC_i is the support condition.

Based on the independent variables and dependent variables provided above, it is hypothesized that: BI represents behavioral intention, PE represents performance expectation, EE represents effort expectation, SI represents social influence, P represents price value, HM represents hedonic motivation, H represents habit, SC represents supporting conditions.

3.3. Compare the Usage and Factors Determining the Behavior Intention to Use the New and the Traditional E-Commerce Platforms

Objective 3 of this study are to compare consumers' usage behavior and compare factors determining the behavior intention to use the new e-commerce platform DouYin and the traditional e-commerce platforms TaoBao and JingDong. To fulfill these objectives, this study employed the t-test of significance for two unknown means and unknown standard deviations as shown in equation 5 below.

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}, \quad (5)$$

where $\bar{x}_1, \mu_1, S_1$, and n_1 are the sample mean, population mean, sample standard deviation, and sample size of the new e-commerce platform group. $\bar{x}_2, \mu_2, S_2$, and n_2 are the sample mean, population mean, sample standard deviation, and sample size of the traditional e-commerce platform group.

For Objective 3, we employ the t-test to compare the means of the behavior intention to use the new e-commerce platform (BI^{NEW}) and the behavior intention to use the traditional e-commerce platform (BI^{Trad}).

For Objective 4, the t-test is used to compare the means of all factors affecting the behavior intention to use the new and traditional e-commerce platform. Specifically, we test the differences between PE^{NEW} and PE^{TRAD}, EE^{NEW} and EE^{TRAD}, SI^{NEW} and SI^{TRAD}, P^{NEW} and P^{TRAD}, HM^{NEW} and HM^{TRAD}, HA^{NEW} and HA^{TRAD}, SC^{NEW} and SC^{TRAD}.

4. RESULTS

4.1. Beijing Basic Information (Male: 35/Female: 69)

1. Gender: More female respondents (66.35%) than males (33.65%) as women shop more online.

2. Age: 20-29 age group largest (33 people), followed by 30-39. Online shopping new trend, so these age groups more likely.

3. Educational background: 72.12% have bachelor's degree. Educational level concentrated, related to survey in Beijing.

4. Occupation: Private employees (50.96%), business owners (15.38%), and students (11.54%) top three. Private employees have stable income, business owners have decision-making power, students have time.

5. Income: 7501-8500-yuan highest proportion (23.07%), followed by 8001-9000 yuan. Monthly income above 15001-yuan low. Different incomes affect consumption patterns.

6. Amount spent on online shopping each month: High at both ends and low in the middle. Average 2,888.68 yuan. Reflects diversity and personalization. Platforms can provide diverse goods.

7. Products you usually purchase from online platform: Sports/outdoor highest (26.92%), then culture/entertainment. Shows diverse consumption patterns.

8. How often do you use the e-commerce platform to make a purchase in a week: 65.38% 3 - 6 days, 23.08% 1 - 2 days, 11.54% every day. High interaction. Platforms should provide seamless experience.

9. When do you typically shop online: Night (36.54%) and afternoon (13.46%) highest. Businesses should focus marketing efforts on these times.

10. Which online shopping platform do you usually use: 59.62% traditional Taobao/Jing Dong, 40.38% new DinYin. Traditional has significant share but new platforms growing. Factors influence choices.

4.2. Beijing Reliability and Validity Analysis

Cronbach's Alpha Based on Standardized Items = 0.975(Douyin-e commerce)/0.980(traditional e-commerce). Table 4 shows Validity of Beijing DouYin e-commerce whereas Table 5 shows Validity of Beijing traditional e-commerce below.

Table 4: Validity of Beijing DouYin e-commerce

Eigen value (Unrotated)	18.504	1.618	1.386	1.170	1.057	-
% of Variance (Unrotated)	56.074%	4.903%	4.201%	3.544%	3.204%	-
Cumulative % of Variance(Unrotated)	56.074%	60.977%	65.178%	68.723%	71.926%	-
Eigen value(Rotated)	6.294	5.327	4.222	3.990	3.903	-
% of Variance(Rotated)	19.072%	16.141%	12.795%	12.092%	11.826%	-

Cumulative % of Variance(Rotated)	19.072%	35.213%	48.008%	60.100%	71.926%	-
KMO value	0.798					-
Bartlett's Test value	1256.383					-
Df	528					-
Sig.	0.000					-

Table 5: Validity of Beijing traditional e-commerce

Eigen value (Unrotated)	20.457	1.171	1.046	-
% of Variance (Unrotated)	61.991%	3.550%	3.169%	-
Cumulative % of Variance(Unrotated)	61.991%	65.541%	68.710%	-
Eigen value(Rotated)	9.425	7.593	5.656	-
% of Variance(Rotated)	28.561%	23.010%	17.139%	-
Cumulative % of Variance(Rotated)	28.561%	51.571%	68.710%	-
KMO value	0.912			-
Bartlett's Test value	1924.537			-
Df	528			-
Sig.	0.000			-

(The results after the reliability and validity test are shown as above. Only the result part is intercepted.)

4.3. Beijing the Results of the Regression Model and T-Test are as Follows

4.3.1. Linear Regression Analysis Result (*n=104)* Male: 35/Female: 69

R ^{2}	0.979
Adjust R ^{2}	0.921
F	F (75,28)=17.110,p=0.000
D-W value	2.142

Remark: Dependent variable = 10、（Which online shopping platform do you usually use?)* p<0.05 ** p<0.01

(The results after the reliability and validity test are shown as above. Only the result part is intercepted.)

4.3.2. Positive Influence Relationship

Using Douyin e-commerce allows users to buy their favorite products, Douyin e-commerce platform social celebrities have a great influence, and the shopping method on the platform is novel. These three aspects will have a significant positive influence on "Which online shopping platform am I used to shopping on?" This means that when users think that they can buy their favorite products on Douyin e-commerce, are greatly influenced by social celebrities, and think that the shopping method is novel, they are more inclined to choose Douyin e-commerce platform for online shopping.

4.3.3. Negative Influence Relationship

Douyin e-commerce allows users to buy better quality products, users are satisfied with the ease of use of personalized recommendations provided by Douyin e-commerce platform, feel happy when shopping, even if they do not use Douyin e-commerce and use other platforms with similar shopping methods, they are satisfied and continue to use Douyin e-commerce platform customer service quality. These five aspects will have a significant negative influence on "Which online shopping platform am I used to shopping on?" This seems a bit contradictory, but it may mean that these factors may, to a certain extent, lead to users' high satisfaction with other platforms, thereby reducing their unique preference for Douyin e-commerce platform.

4.3.4. T-Test Analysis Results (n=104) Male:35/Female:69

The T-test result for different online shopping platforms. The results show that for different variables (such as gender, age, educational qualifications, occupation, income, monthly online shopping expenditure, usually purchased products, online shopping frequency, online shopping time, various evaluations of Douyin e-commerce platform and traditional e-commerce platform, etc.), in the comparison of the two types of platforms, the p-value is all 0.000, reaching an extremely significant level. This indicates that there are significant differences between the Douyin e-commerce platform and the traditional e-commerce platform in various indicators. Specifically,

for all questions involving evaluations of the Douyin e-commerce platform, when the respondents choose the Douyin e-commerce platform as the usually used platform (n = 42), there are specific mean and standard deviation data; while when the respondents choose the traditional e-commerce platform as the usually used platform (n = 62), the mean value of the corresponding question is 0. Conversely, for all questions involving evaluations of traditional e-commerce platforms, the situation is the opposite. This shows that respondents have obvious differences in feelings and evaluations of different types of e-commerce platforms.

4.3.5. Guangzhou Basic Information (Male: 24/Female: 79)

1. Gender: Females (76.70%) dominate over males (23.30%). Implies female users might be more dominant in both traditional and Douyin e-commerce.

2. Age: Diverse age range from 18 to 59. No specific dominant age group, indicating e-commerce caters to a wide range.

3. Educational qualifications: Majority (76.70%) have bachelor's degree. Suggests those with this level are main e-commerce users.

4. Occupation: Private employees (63.11%) largest, followed by business owners (12.62%) and students (11.65%). Reflects diverse usage.

5. Income: Scattered distribution from 1900 to 20000 yuan. Shows different income levels engage in e-commerce.

6. Amount spent on online shopping each month: High proportion spend less or at intermediate level in Guangzhou. Average 2935.62 yuan. Reflects rational consumption.

7. Products you usually purchase from online platform: Sports/outdoor (25.24%) highest, followed by beauty/skin care (17.48%). Suggests product variety on both platforms.

8. How often do you use the e-commerce platform to make a purchase in a week: 72.82% use 3 - 6 days? Indicates high engagement.

9. When do you typically shop online: Afternoon (35.92%) and night (33.98%) most popular. Platforms should focus on these times.

10. Which online shopping platform do you usually use: 62.14% use Douyin. Shows its growing popularity. Traditional platforms need to innovate.

4.3.6. Guangzhou Reliability and Validity Analysis

Cronbach's Alpha Based on Standardized Items = 0.977 (DouYin e-commerce)/0.982(traditional e-commerce). Validity of Guangzhou DouYin e-commerce shown in Table 6 and Validity of Guangzhou traditional e-commerce shown in Table 7.

Table 6: Validity of Guangzhou DouYin ecommerce

Eigen value (Unrotated)	19.056	1.326	1.140	-	19.056	1.326
% of Variance (Unrotated)	57.745%	4.018%	3.453%	-	57.745%	4.018%
Cumulative % of Variance(Unrotated)	57.745%	61.763%	65.216%	-	57.745%	61.763%
Eigen value(Rotated)	7.829	7.579	6.113	-	7.829	7.579
% of Variance(Rotated)	23.725%	22.966%	18.526%	-	23.725%	22.966%
Cumulative % of Variance(Rotated)	23.725%	46.691%	65.216%	-	23.725%	46.691%
KMO value	0.924					-
Bartlett's Test value	1778.275					-
Df	528					-
Sig.	0.000					-

Table 7: Validity of Guangzhou traditional e-commerce

Eigen value(Rotated)	7.821	6.763	5.277	4.726
% of Variance(Rotated)	23.699%	20.494%	15.991%	14.321%
Cumulative % of Variance(Rotated)	23.699%	44.193%	60.184%	74.505%
KMO value	0.692			-
Bartlett's Test value	1416.413			-
df	528			-
Sig.	0.000			-

(The results after the reliability and validity test are shown as above. Only the result part is intercepted.)

4.4. Guangzhou the Results of the Regression Model and T-test are as follows

4.4.1. Linear Regression Analysis Results (n=103) Male:24/Female:79)

R ^{2}□	0.987
Adjust R ^{2}□	0.950
F□	F (75,27)=26.711,p=0.000

Remark: Dependent variable = 10、（Which online shopping platform do you usually use?）* p<0.05 ** p<0.01

(The results after the reliability and validity test are shown as above. Only the result part is intercepted.)

4.4.2. Positive Influence Relationship

For traditional e-commerce platforms, four variables show significant positive influence relationships:

“(Traditional e-commerce platforms are useful for my online shopping)”.

“(Traditional e-commerce platform makes me more willing to shop online)”.

“(My payment system and process on the traditional e-commerce platform is safe and convenient)”.

“(I am satisfied with the quality of customer service provided by the traditional e-commerce platform and will continue to use it)”.

These variables indicate that when consumers believe that traditional e-commerce platforms are useful for online shopping, make them more willing to shop online, have a safe and convenient payment system, and are satisfied with the quality of customer service, they are more inclined to choose traditional e-commerce platforms for shopping.

4.4.3. Negative Influence Relationship

“Occupation” will have a significant negative influence on consumers' choice of online shopping platforms. This may mean that when consumers in certain occupations choose online shopping platforms, their work characteristics may cause them to be less inclined to choose specific online shopping platforms.

The two variables “(When shopping, I will recommend traditional e-commerce platforms to my friends or family)” and “(When I shop on traditional e-commerce platform, I am satisfied with its novel shopping method)” also have a significant negative impact on consumers’ choice of online shopping platforms. This may indicate that when consumers recommend traditional e-commerce platforms to others or believe that traditional e-commerce platforms have novel shopping methods, they are less likely to choose traditional e-commerce platforms for shopping. This seemingly contradictory result may be related to other consumer needs or psychological factors.

4.4.4. No Influence

Many variables related to Douyin e-commerce platform, such as "(Using DouYin e-commerce allows me to buy the products I like)", "(DouYin e-commerce allows me to buy higher quality products.)", "(I satisfy to the simplicity of payment process on Douyin e-commerce platform) i", etc., and most variables related to traditional e-commerce platforms but not mentioned in positive or negative influence relationships, such as "(Using traditional e-commerce allows me to buy the products I like)", "(I am satisfied with the content of traditional e-commerce platform, which is simple and easy to understand.)", etc., will not have an influence relationship on "Which online shopping platform do I usually use for shopping?". These variables cover multiple aspects such as product preferences, payment processes, content understandability, and influence of social celebrities, indicating that in the current study, these factors have not significantly affected consumers' choice of online shopping platforms.

4.4.5. T-Test Analysis Results (n=103) Male:24/Female:79)

A study in Guangzhou using an independent sample t-test found no significant differences in variables [1]-[9] depending on shopping platform choice. However, for variables [11]-[44] related to Douyin e-commerce, users had significantly higher average values in multiple dimensions compared to traditional e-commerce (variables [45]-[76]), highlighting Douyin e-commerce's advantages and traditional e-commerce's challenges. This provides insights for e-commerce platforms to meet evolving consumer demands.

4.4.6. Shenzhen Basic Information (Male: 35/Female: 70)

1. Gender: Females (66.67%) more than males (33.33%). Suggests more female users on e-commerce platforms.

2. Age: No dominant age group. Shows e-commerce attracts various ages.

3. Educational qualifications: Majority have bachelor's degree (74.29%). Implies active users at this level.

4. Occupation: Private employees (47.62%) largest, followed by retirees and students. Reflects diverse usage.

5. Income: Diverse. Shows different levels affect shopping choices.

6. Amount spent on online shopping each month: In Shenzhen, mainly 2,500 - 3,000 yuan. Reflects rational consumption.

7. Products you usually purchase from online platform: Culture/entertainment (25.71%) highest, then beauty/skin care. Suggests variety on platforms.

8. How often do you use the e-commerce platform to make a purchase in a week: 68.57% use 3 - 6 days. High engagement.

9. When do you typically shop online: Night (38.10%) and afternoon (25.71%) popular. Platforms should focus on these times.

10. Which online shopping platform do you usually use: 61.90% traditional TaoBao/Jing Dong, 38.10% new DinYin. Traditional has share but new gaining popularity.

4.4.7. Shenzhen Reliability and Validity Analysis

Cronbach's Alpha Based on Standardized Items = 0.959(Douyin e-commerce)/0.981(traditional e-commerce). Validity of Shenzhen DouYin e-commerce shown Table 8 and Validity of Shenzhen traditional e-commerce sown in Table 9.

Table 8: Validity of Shenzhen DouYin e-commerce

Eigen value (Unrotated)	14.447	1.900	1.671	1.521	1.419	1.287
% of Variance (Unrotated)	43.780%	5.758%	5.063%	4.608%	4.299%	3.901%
Cumulative % of Variance(Unrotated)	43.780%	49.538%	54.600%	59.209%	63.508%	67.409%
Eigen value(Rotated)	4.207	3.721	3.247	3.231	3.212	2.456
% of Variance(Rotated)	12.749%	11.276%	9.839%	9.790%	9.735%	7.443%
Cumulative % of Variance(Rotated)	12.749%	24.024%	33.863%	43.653%	53.388%	60.830%
KMO value	0.496					-
Bartlett's Test value	1004.716					-
Df	528					-
Sig.	0.000					-

Table 9: Validity of Shenzhen traditional e-commerce

Eigen value (Unrotated)	20.619	1.070	1.038	-
% of Variance (Unrotated)	62.481%	3.244%	3.145%	-
Cumulative % of Variance(Unrotated)	62.481%	65.725%	68.869%	-
Eigen value(Rotated)	8.822	7.330	6.574	-
% of Variance(Rotated)	26.734%	22.213%	19.923%	-
Cumulative % of Variance(Rotated)	26.734%	48.947%	68.869%	-
KMO value	0.906			-
Bartlett's Test value	2028.943			-
Df	528			-
Sig.	0.000			-

(The results after the reliability and validity test are shown as above. Only the result part is intercepted.)

4.5. Shenzhen the Results of the Regression Model and T-test are as Follows

4.5.1. Linear Regression Analysis Results (n=105) Male:35/Female:70)

R ^{2}□	0.987
Adjust R ^{2}□	0.955
F□	F (75,29)=30.153,p=0.000
D-W value	2.233

Remark: Dependent variable = 10、（Which online shopping platform do you usually use?）* p<0.05 ** p<0.01

(The results after the reliability and validity test are shown as above. Only the result part is intercepted).

4.5.2. Positive Influence Relationship

Variables "Shopping on Douyin e-commerce platform can help me save time" and "I am satisfied with the ease of use of personalized recommendations provided by Douyin e-commerce platform" have a significant positive influence on choosing Douyin e-commerce for shopping.

4.5.3. Negative Influence Relationship

Factors like "The amount of money spent on online shopping each month", "Douyin e-commerce platform is useful for your online shopping", "When I shop, Douyin consumption is happier", "When I use Douyin e-commerce platform, I can solve problems immediately", "The payment system and process on Douyin e-commerce platform is safe and convenient", and "I am very satisfied with the shopping experience of Douyin e-commerce platform and will continue to use it" have a significant negative influence on choosing Douyin e-commerce. This may mean consumers have higher expectations for other platforms.

4.5.4. No Influence

Many variables including personal characteristic variables like gender, age, education, and variables related to traditional e-commerce platforms and some aspects of Douyin e-commerce platform do not influence the choice of online shopping platforms.

4.5.5. T-Test Analysis Results (n=105) Male:35/Female:70)

A study in Shenzhen used an independent sample t-test to analyze differences between “Which online shopping platform do I usually use for shopping” and other variables. No significant differences were found in variables related to gender, age, etc. but significant differences emerged in many other variables. Douyin e-commerce is highly recognized by users, likely due to its combination of short-video content, influence of social celebrities, personalized recommendations, and easy payment processes. Traditional e-commerce platforms have lower average values on corresponding variables compared to Douyin e-commerce. They may be slower to adapt to market trends and user demands. The study shows differences in user choices between Douyin e-commerce and traditional platforms, providing an important reference for e-commerce development. In the future, e-commerce platforms need to find a balance between functionality and entertainment and continuously innovate to meet evolving user needs.

4.5.6. Shanghai Basic Information (Male: 30/Female: 74)

1. Gender: Females (71.15%) more than males (28.85%). Suggests more female users on e-commerce platforms.

2. Age: No dominant age group. Shows e-commerce attracts various ages.

3. Educational qualifications: Majority have bachelor's degree (80.77%). Implies active users at this level.

4. Occupation: Students (44.23%) largest, followed by private employees. Reflects diverse usage.

5. Income: Diverse. Shows different levels affect shopping choices.

6. Amount spent on online shopping each month: In Shanghai, high at both ends and low in the middle. Average 5,046.54 yuan. Reflects high consumption starting point.

7. Products you usually purchase from online platform: Sports/outdoor (28.85%) highest, then culture/entertainment. Suggests variety on platforms.

8. How often do you use the e-commerce platform to make a purchase in a week: 68.27% use 3 - 6 days? High engagement.

9. When do you typically shop online: Afternoon and night popular. Platforms should focus on these times.

10. Which online shopping platform do you usually use: 59.62% traditional (TaoBao/Jing Dong), 40.38% new (DinYin). Traditional has share but new gaining popularity.

4.5.7. Shanghai Reliability and Validity Analysis

Cronbach's Alpha Based on Standardized Items = 0.975(Douyin ecommerce)/0.982(traditional ecommerce). Table 10 shows Validity of Shanghai DouYin e-commerce and Validity of Shanghai traditional e-commerce shown in Table 11.

Table 10: Validity of Shanghai DouYin e-commerce

Eigen value (Unrotated)	18.497	1.458	1.323	1.082	-	18.497
% of Variance (Unrotated)	56.051%	4.418%	4.010%	3.280%	-	56.051%
Cumulative % of Variance(Unrotated)	56.051%	60.468%	64.478%	67.758%	-	56.051%
Eigen value(Rotated)	8.529	5.400	4.441	3.989	-	8.529
% of Variance(Rotated)	25.847%	16.365%	13.457%	12.089%	-	25.847%
Cumulative % of Variance(Rotated)	25.847%	42.212%	55.669%	67.758%	-	25.847%
KMO value	0.795					-
Bartlett's Test value	1201.033					-
Df	528					-
Sig.	0.000					-

Table 11: Validity of Shanghai traditional e-commerce

Eigen value (Unrotated)	20.863	1.061	-	20.863
% of Variance (Unrotated)	63.220%	3.217%	-	63.220%
Cumulative % of Variance(Unrotated)	63.220%	66.436%	-	63.220%
Eigen value(Rotated)	11.791	10.133	-	11.791
% of Variance(Rotated)	35.730%	30.707%	-	35.730%
Cumulative % of Variance(Rotated)	35.730%	66.436%	-	35.730%
KMO value	0.902			-
Bartlett's Test value	1957.792			-
Df	528			-
Sig.	0.000			-

(The results after the reliability and validity test are shown as above. Only the result part is intercepted.)

4.6. Shanghai the Results of the Regression Model and T-Test are as Follows

4.6.1. Linear Regression Analysis Results (n=104) Male:30/Female:74)

R^2	0.975
Adjust R^2	0.906
F	F (75,28)=14.284,p=0.000
D-W value	2.009
Remark: Dependent variable = 10、（Which online shopping platform do you usually use?）	

* $p<0.05$ ** $p<0.01$

(The results after the reliability and validity test are shown as above. Only the result part is intercepted.)

4.6.2. Positive Influence Relationship

“Shopping on Douyin e-commerce platform can help me save time” makes consumers more likely to choose Douyin.

“If I don’t use Douyin e-commerce shopping and use other e-commerce platforms with the same shopping method, I will be satisfied” has a positive influence, indicating some universality in Douyin's shopping methods.

4.6.3. Negative Influence Relationship

“Douyin e-commerce platform is useful for your online shopping” has a negative influence as consumers may have similar expectations for other platforms.

“When I shop, Douyin consumption is happier” has a negative influence as happiness may not be unique to Douyin.

4.6.4. No Influence

Personal characteristic variables, traditional e-commerce platform related variables, and most Douyin e-commerce platform variables did not significantly affect consumers' choice of online shopping platform. This may be due to these not being key decision factors or differences between platforms not being obvious enough.

4.6.5. T-Test Analysis Results (n=104) Male:30/Female:74)

A study in Shanghai used an independent sample t-test to analyze differences between "Which online shopping platform do I usually use for shopping?" and 76 other variables. Variables related to gender, age, etc., showed no significant differences, but a divergence was seen in many other variables. Douyin e-commerce is highly regarded by users for its usefulness in online shopping, ability to help find desired products, offer high-quality items, save time, be user-friendly, have a simple payment process, offer multilingual support, personalized recommendations, be influenced by social celebrities, offer price advantages, ensure authenticity, have promotions, be novel and interactive, and more. In contrast, traditional e-commerce platforms fall short in these areas. This highlights the disparities in user choices between Douyin e-commerce and traditional platforms. Douyin's social media integration and continuous feature improvement contribute to its popularity. Traditional platforms need to innovate to remain competitive. Understanding these differences can guide future e-commerce developments, focusing on enhancing user experience, leveraging social media, improving personalization, and ensuring authenticity and quality.

5. CONCLUSION

In conclusion, the e-commerce scene in these four cities paints a vivid picture of shared habits and unique preferences, offering plenty of valuable lessons for platforms to stay ahead. With more female shoppers and a wide range of age groups, it is clear that e-commerce has become a regular part of daily life for many. This means platforms must be thoughtful—not just in catering to different types of customers, but in delivering quality and convenience, especially during the popular afternoon and evening shopping hours. However, each city brings its flavour regarding

what people buy and where they shop, reminding us that a one-size-fits-all approach will not work. TaoBao and JingDong still hold their ground with solid reputations. However, Douyin's fast-growing popularity, driven by its engaging and social shopping experience, is a wake-up call for the entire industry. To thrive in the future, platforms must balance offering trustworthy, reliable services and creating exciting, interactive experiences that truly connect with their users. The future of e-commerce belongs to those who can build that personal touch while staying ahead of changing consumer needs.

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Analyzing the Impact of Shenzhen's Cross-Border E-commerce Platform on Consumers' Willingness to Purchase

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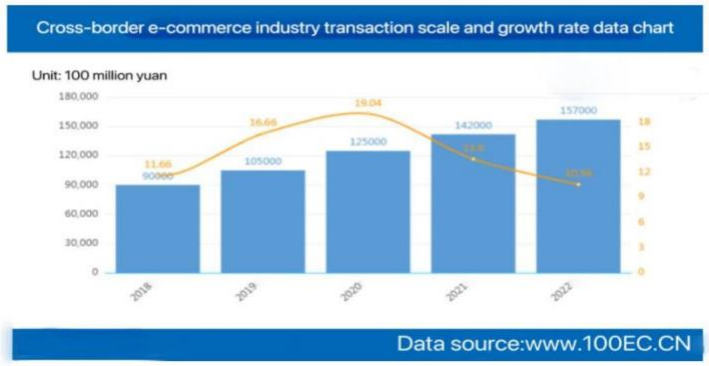
ABSTRACT

In the era of economic globalization and rapid advancements in Internet technology, e-commerce is emerging as the dominant force reshaping international trade landscapes. While China's international trade growth has experienced a notable slowdown in recent years, the rise of cross-border digital commerce has signified a transformative shift. Since its inception in 2011, cross-border digital commerce in China has gained significant momentum, with Shenzhen emerging as a pioneering city in this domain. By 2013, Shenzhen had established itself as a leader in e-commerce exports, and by 2017, it began to excel in imports as well. The city boasts a rich tapestry of resources, exceptional innovation capabilities, and highly efficient logistics networks, all of which bolster its position in the realm of international digital commerce. This dynamic environment not only offers consumers a wide array of shopping opportunities but also plays a pivotal role in enhancing Shenzhen's GDP, thereby underscoring the critical impact of digital commerce on the economy and positioning China as a key player in the global marketplace.

Keywords: Multiple Logistic Regression Model, SOR Theoretical model, Shenzhen's cross-border E-commerce platform

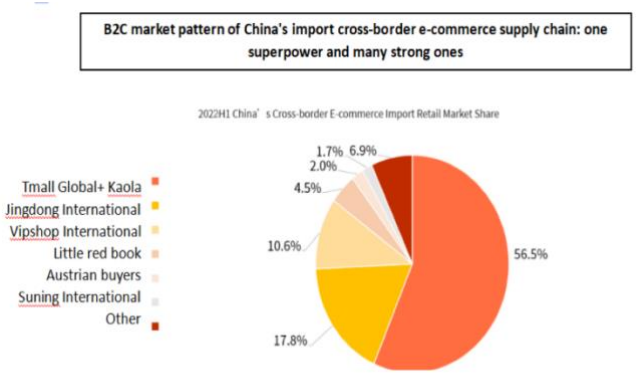
1. INTRODUCTION

Despite the global economic downturn and China's slowdown in foreign trade, international e-commerce has emerged strongly. It has grown remarkably as a new economic growth catalyst in recent years. As a new trade form, it simplifies the trading process, reduces time, and has unique immediacy while increasing profit margins for both sides. As shown in Figure 1, China's international e-commerce market is expected to reach 15.7 trillion yuan in 2022, with an annual growth of 10.56% from 2021(Kang & Chen, 2023). The market has expanded substantially from 2018 to 2021 with sizes and growth rates as follows: 9 trillion yuan (11.66%), 10.5 trillion yuan (16.66%), 12.5 trillion yuan (19.04%), and 14.2 trillion yuan (13.6%). The data shows an upward trend in China's international e-commerce. Especially in recent years, cross-border trade volumes have surged from 9 trillion yuan in 2018 to 15.7 trillion yuan in 2022 (Zhu et al., 2023).



Source: Wangjingshe ;www.100EC.CN

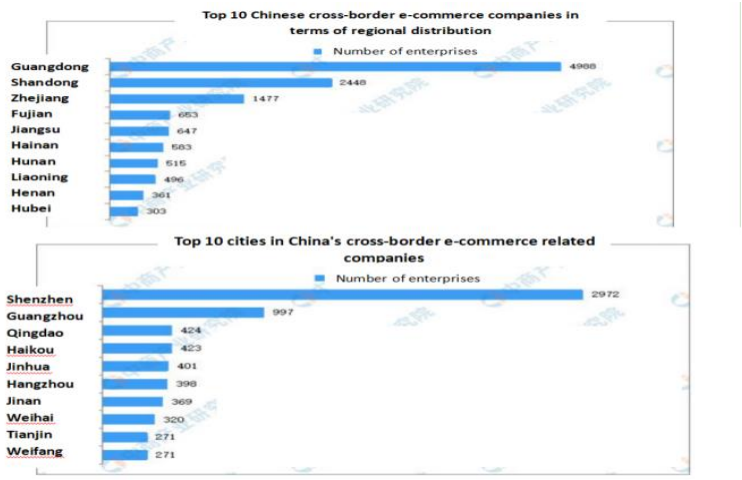
Figure 1: 2018-2022 cross-border e-commerce industry transaction scale and growth rate data chart



Source: data.iimedia.cn

Figure 2: 2022H1 China's cross-border e-commerce import retail market share

Tmall Global and KaolaHaigou have a combined 56.5% market share. They are under Alibaba with strong resources and influence. JD International has 17.8%. Vipshop International (10.6%) and Xiaohongshu (4.5%) also have shares. Others account for 6.9%. Overall, Alibaba platforms have a large combined share, JD has a certain share, and there's competition (Luo, 2024). The market share reflects key players and the competitive landscape in China's cross-border e-commerce market as shown in Figure 2.



Source:www.askci.com

Figure 3: Regional distribution of China's cross-border e-commerce related companies

In regional distribution in 2022, Guangdong ranks first with 4,988 companies in international e-commerce. Shandong and Zhejiang are second and third with 2,448 and 1,477 companies (Kang & Chen, 2023). Fujian, Jiangsu, Hainan, Hunan, etc. are also in this industry. From the city perspective in 2022, Shenzhen is first with 2,972 cross-border e-commerce companies as shown in Figure 3. Guangzhou and Qingdao are in the top three with 997 and 424 companies. Then there are Haikou, Jinhua, Hangzhou, Jinan, etc.

1.1. Research Objective

1. To study the influencing factors of Shenzhen’s cross-border e-commerce platform on consumers' purchase intention.

2. Analyze the market trends and future development prospects of Shenzhen's cross-border e-commerce platform.

2. LITERATURE REVIEW

In recent years, the significance of international trade has increased significantly due to various global factors, which has prompted researchers to investigate the impact of e-commerce platforms on consumer purchase intentions. For example, Xiao et al. (2019) conducted a comprehensive examination of the context that influences consumers' purchase intentions on cross-border e-commerce platforms. They effectively identified the primary influencers of these intentions and created a comprehensive theoretical framework. They acknowledged the necessity of further refining specific aspects of their questionnaire to improve reliability even though they had validated their proposed model (Cai et al., 2018).

Luo(2024) examined the impact of wireless networks and machine learning on the purchase intentions of cross-border e-commerce consumers. The research conducted by the authors combined an exhaustive literature review with an empirical survey, which provided valuable

insights. However, the generalizability of their findings was restricted by the small sample size and non-random sampling. Han et al. (2023) implemented the Information System Success Model to investigate how consumer purchase intentions are affected by the quality of cross-border e-commerce platforms. They acknowledged that the applicability of their results may be restricted by regional variations, which could limit their applicability to consumers in various geographic locations despite the significant contribution of their study (Zhu et al., 2023).

On a more extensive scale, Tikhomirova et al. (2021) investigated the relationship between customer characteristics and purchase intentions in various e-commerce environments. Their research contributes to the body of knowledge regarding digital consumer behaviour by elucidating how personal characteristics can impact purchasing decisions in various contexts. Similarly, Han et al. (2023) employed the theory of planned behaviour to investigate the correlation between consumers' perceptions of e-service quality and their desire for uniqueness in Korea. Their research developed a comprehensive framework that addressed factors that had been previously disregarded, thereby providing valuable insights into the field of consumer behaviour within the context of e-commerce (Beatty et al., 2011). Nevertheless, it also recognized the need for additional research to substantiate its conclusions, as with other studies.

Domestic and foreign scholars approach the subject of cross-border e-commerce with distinct methodologies and areas of focus when summarizing the research. The cross-border e-commerce market in China is the primary focus of domestic academicians, who employ qualitative and quantitative methodologies (Liu et al., 2021). Their research frequently concentrates on domestic platforms, integrating Chinese cultural nuances into their theoretical frameworks to better understand the local consumer market. These academicians typically investigate consumer acceptance, preferences, and behaviour within China's distinctive market dynamics. Conversely, foreign scholars embrace a more comprehensive, global perspective (Jin& Wang, 2016). Their research frequently employs international surveys and other methodologies to provide a more comprehensive understanding of consumer behaviour. In contrast to domestic researchers, foreign academicians concentrate on global market trends, underscoring the disparities in consumer behaviour among various nations. They typically employ internationally recognized consumer behaviour theories to analyze and elucidate their findings rather than incorporating specific cultural paradigms.

In general, domestic scholars prioritize comprehending the Chinese market through the prism of local culture and consumer preferences, whereas foreign researchers endeavour to offer insights into global e-commerce trends and cross-cultural differences in consumer behaviour. This distinction underscores the researchers' diverse priorities and methodologies, contingent upon their geographic focus and the unique characteristics of their investigated markets.

3. RESEARCH METHODOLOGY

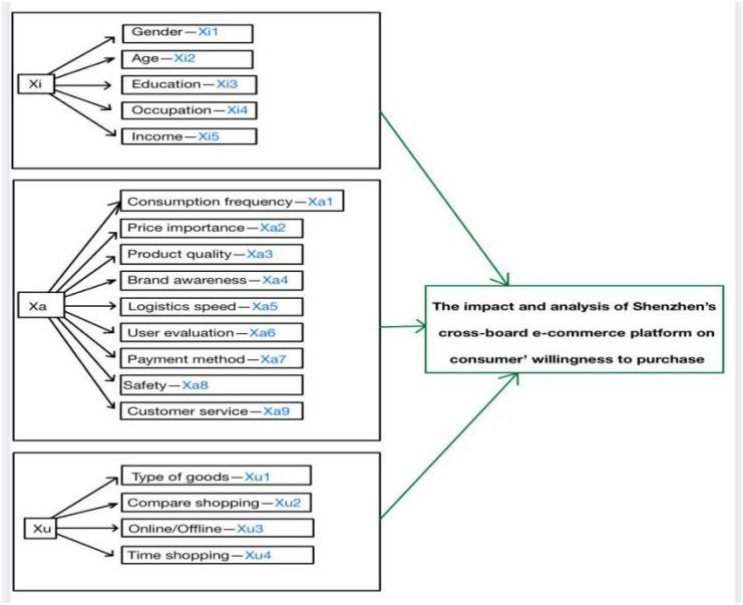
The objective of this research is to guarantee a comprehensive and dependable examination of consumer behavior by utilizing primary data that is directly collected from participants through a meticulously designed questionnaire process. In order to ensure the precision of data acquisition and interpretation, the investigation will implement a structured, sequential methodology. The initial phase entails the meticulous selection of a sample group that accurately represents the population under investigation and the development of instruments to assess critical factors,

including behaviors and purchase intentions. Questionnaires will be distributed across multiple software platforms to reach a widespread audience once the sample is finalized, and the collected responses will be subjected to a detailed analysis. To gain a more comprehensive comprehension of the factors at play, we will utilize regression analysis and descriptive statistics to identify relationships between various variables. The objective of the research is to collect 384 completed surveys, which will be subsequently analyzed using software such as Stata and Excel to guarantee accurate interpretation of the data. Subsequently, we will conduct a more comprehensive analysis of the participants' characteristics, with a particular focus on the specific factors that influence consumer purchasing behavior, particularly in the international e-commerce market of Shenzhen. In the final stage, we will construct a predictive model using the data and analyze the coefficients of the model to extract valuable insights. These findings will assist in the identification of the primary determinants that influence consumer behavior in this market, thereby generating valuable information for both academic research and practical implementations in the e-commerce sector.

4. RESEARCH RESULTS

4.1. Scope of the Study

The main analysis of this study is: the impact of Shenzhen cross-border e-commerce platform on consumers' willingness to purchase. The study was conducted in the form of an online questionnaire with citizens aged 18 to 50 (the majority of online shoppers in China are between the ages of 18 and 50). Figure 4 illustrates the Conceptual Framework and model.



Logit model. VS Probit model:

1.The form of the Logit regression model is as follows:

$$P(Y=1) = \frac{1}{1+e^{-(\beta_0+\beta_1 Gender+\beta_2 Age+\beta_3 Edu+\beta_4 Occu+\beta_5 income+\beta_6 Consumption\ Frequency\ldots+\beta_{18} Time\ shopping)}}$$

1. P=(Y=1)=The probability of happening
2. e=Base of natural logarithm
3. β0, β1...β18=Model parameters, indicating the impact of independent variables on the probability of occurrence of dependent variables

2.The form of the Probit model is as follows:

$$P(Y=1) = \Phi\ (\beta_0 + \beta_1 Gender + \beta_2 Age + \beta_3 Edu + \beta_4 Occu + \beta_5 income + \beta_6 Consumption\ Frequency\ldots + \beta_{18} Time\ shopping)$$

1. P=(Y=1)=The probability of happening
2. Φ= The cumulative distribution function (CDF) of the standard normal distribution
3. β0, β1...β18=Model parameters, indicating the impact of independent variables on the probability of occurrence of dependent variables

Figure 4: Conceptual Framework and Model

4.2. Maximum Likelihood Estimation

Available through Maximum Likelihood Estimation：

$$Y_i \begin{cases} 1, & Y_i > 2.5 \\ 0, & Y_i < 2.5 \end{cases}$$

Y = dependent variable (consumer's willingness to purchase)

1=willing to buy (when the test result is greater than 2.5)

0=unwilling to buy (when the test result is less than 2.5)

4.3. Factor Description

4.3.1. Xi：Basic Information

Xi1：Gender；Xi 2：Age；Xi 3：Education；Xi 4：Occupation；Xi 5：Income

4.3.2. Xa：Secondary Information

Xa1：Consumption frequency；Xa2：Price importance；Xa3：Product quality；Xa4：Brand awareness；Xa5：logistic speed；Xa6：User evaluation；Xa7：Payment method；Xa8：Safety；Xa9：Costumer service

4.3.3. Xu：Third Information

Xu1：Type of groups; Xu2: Compare shopping; Xu3: Online/Offline; Xu4: Time Shopping

4.4. Measures of Model Fit

- AIC: Model performance evaluation uses fit indices like AIC. AIC for model selection: AIC = -2lnL(Mβ) + 2k. -2lnL(Mβ) (0 to +∞), more parameters make it smaller. Add 2k. Smaller AIC means better fit. Equation 1 as mentioned below.

$$AIC = -2\mathrm{In}L(M_\beta) + 2k \qquad (1)$$

- BIC and sBIC: Also called SIC or sBIC. Raftery (1996) proposed for model fit. BIC = -2lnL(Mβ) + kln(n). sBIC adjusted. Smaller BIC means better fit. BIC difference shows model likelihood. The description for the dependent variable and explanatory variables are shown in Table 1. Equation 2 is mention below.

$$BIC = -2\mathrm{In}L(M_\beta) + k.\mathrm{In}(n). \quad (2)$$

Table 1: Variable description

Variable	**Variable name**	**Variable description**
Dependent variable		
Y	Purchase Intention	0 = Do not buy, 1 = Buy
Explanatory variables		
Q1	Gender	0=Female，1=Male
Q2	Age	From 18~~50 years old
Q3	Education level	1=High school and below, 2=Junior college, 3=Undergraduate, 4=Master and above
Q4	Occupation	1=Student, 2=Office worker, 3=Freelancer, 4=Other
Q5	Income(per month)	1=Less than 5,000 yuan, 2=5,000 yuan - 10,000 yuan, 3=10,000 yuan - 20,000 yuan, 4=20,000 yuan - 30,000 yuan, 5=More than 30,000 yuan
Q6	Consumption frequency	1=Very Less, 2=Less, 3=Generally, 4=Frequently,5=Very Frequently
Q7	Price importance	1=Unimportant,2=not so important, 3=Generally,4=Important,5=Very Important
Q8	Product quality	1=Unimportant,2=not so important, 3=Generally,4=Important,5=Very Important
Q9	Brand awareness	1=Unimportant,2=not so important, 3=Generally,4=Important,5=Very Important
Q10	Logistics speed	1=Unimportant,2=not so important, 3=Generally,4=Important,5=Very Important
Q11	User evaluation	1=Unimportant,2=not so important, 3=Generally,4=Important,5=Very Important

Q12	Payment method for online	1=Unimportant,2=not so important, 3=Generally,4=Important,5=Very Important
Q13	Payment safety	1=Unimportant,2=not so important, 3=Generally,4=Important,5=Very Important
Q14	Customer service	1=Unimportant,2=not so important, 3=Generally,4=Important,5=Very Important
Q15	Types of goods	1=Beauty products, 2=Clothing, 3=Digital products, 4=Household products, 5=Other
Q16	Compare goods when shopping	1=No,2=Yes, 3=As the case may be
Q17	Online /Offline	1=Online shopping,2=Offline shopping,3=Both
Q18	Time shopping	1=Weekdays, 2=Weekends, 3=Holidays

4.5. Data Collection

This study analyzes influencing factors of Shenzhen's cross-border e-commerce on consumers' purchase intention, market trends, and prospects. Data is collected via an online questionnaire from http://www.wjx.cn/. A screening question is set. Targeted 18 – 50 year olds are major online shoppers. Sample size is at least 384. Questionnaire has three sections: participant info, influencing factors, shopping behaviors & preferences.

5. EMPIRICAL RESULT

5.1. Sample Description

During the formal investigation, 384 online questionnaires were sent and 384 were recovered. After excluding invalid questionnaires, the remaining 384 valid questionnaires were 100%. The questionnaire data are valid and can be used for empirical analysis. The respondents involved different genders and ages, which made the questionnaire more representative and effective.

Sample information in the figure 5, reveals that gender - 55.99% male, 44.01% female. 87.50% bought, 12.50% didn't. Women buy more, men don't buy more. Ages 18 - 50 are evenly distributed. 23 & 28-year-olds bought most. In Education, mostly are undergraduates. In Occupation, mostly are office workers. Mostly have Income mainly 5000 - 10,000 yuan. This shows different consumers have different purchase intentions on Shenzhen's cross-border e-commerce platforms and provides research basis.

Gender:

Table 1: Distribution of respondents by gender

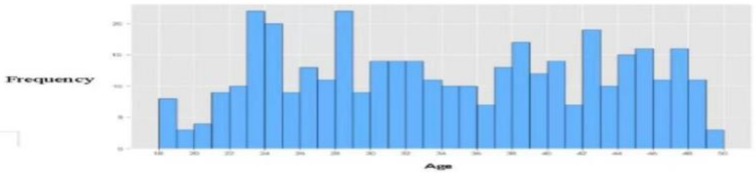
Gender	Frequency	Percent
Male	215	55.99%
Female	169	44.01%
Total	384	100%

Gender	Frequency	Percent
Male (Buy)	134	34.89%
Male (Do not buy)	35	9.11%
Male (Total)	169	44.01%
Female (Buy)	202	52.60%
Female (Do not buy)	13	3.39%
Female (Total)	215	55.99%
Total	384	100%

Age:

Table 2: Distribution of respondents by age

Age	Frequency	Percent
18	8	2.08%
19	3	0.78%
20	4	1.04%
21	9	2.34%
22	10	2.60%
...	...	...
49	1	0.26%
50	2	0.52%
Total	384	100%



Education level:

Table 3: Distribution of respondents by education level

Education level	Frequency	Percent
High school and below	64	16.67%
Junior college	107	27.86%
Undergraduate	180	46.88%
Master and above	33	8.59%
Total	384	100%

Occupation:

Table 4: Distribution of respondents by occupation

Occupation	Frequency	Percent
Student	40	10.42%
Office worker	208	54.17%
Freelancer	88	22.92%
Other	48	12.50%
Total	384	100%

Current income (monthly average):

Table 5: Distribution of respondents by income

Current income (monthly average):	Frequency	Percent
less than 5,000 yuan	140	36.46%
5,000-10,000 yuan	144	37.50%
10,000-20,000 yuan	47	12.24%
20,000-30,000 yuan	31	8.07%
30,000 yuan or more	22	5.73%
Total	384	100%

Figure 5: Sample Information

Model	Current Function Value	Iterations	Function Evaluations	Gradient Evaluations
Logit	0.193829	9		
Probit	0.19215	55	58	58

Figure 6: Model construction (Logit model VS Probit model.)

During model optimization, both Logit and Probit models found the optimal solution illustrates in Figure 6. Logit's final log likelihood value is 0.193829 after 9 iterations. Probit's final value is 0.192150 after 55 iterations. Probit might fit data slightly better but is more complex, needing more computation. Its log-likelihood function and gradient were evaluated 58 times each.

5.2. Model Summary and Significance Analysis

We summarize the results of the Logit and Probit models, and analyze the coefficients, significance levels, and corresponding confidence intervals for each variable. Here are the detailed results of the two models illustrates in Figure 7.

Variable name	Coef (Standard error)	P-value	[0.025, 0.975] CI
Constant term	-0.8837 (2.527)	0.727	[-5.837, 4.069]
Gender	-1.4467 (0.493)	0.003	[-2.414, -0.480]
Age	-0.1162 (0.031)	0.000	[-0.176, -0.056]
Education level	0.0747 (0.318)	0.814	[-0.548, 0.697]
Occupation	1.2075 (0.450)	0.007	[0.326, 2.089]
Income (per month)	0.1118 (0.251)	0.656	[-0.380, 0.604]
Consumption frequency	1.2047 (0.233)	0.000	[0.747, 1.662]
Price importance	0.0209 (0.199)	0.916	[-0.369, 0.411]
Product quality	0.2424 (0.229)	0.289	[-0.206, 0.690]
Brand awareness	0.3024 (0.258)	0.242	[-0.204, 0.809]
Logistics speed	0.0017 (0.209)	0.993	[-0.408, 0.412]
User evaluation	0.2927 (0.212)	0.166	[-0.122, 0.707]
Payment method for online	0.4264 (0.226)	0.060	[-0.017, 0.870]
Payment safety	0.2030 (0.229)	0.376	[-0.247, 0.653]
Customer service	-0.0560 (0.232)	0.809	[-0.511, 0.399]
Preferred product category	-0.3912 (0.221)	0.077	[-0.825, 0.042]
Research preference	0.5174 (0.311)	0.096	[-0.092, 1.127]
Shopping preference	-1.4346 (0.493)	0.004	[-2.401, -0.468]
Shopping time preference	0.2190 (0.284)	0.441	[-0.338, 0.776]

Figure 7: Analyze the coefficients, significance levels, and corresponding confidence intervals for each variable

In the Probit model, gender and age significance is similar to Logit model. Gender coefficient -0.7893, P value 0.003, meaning male users less inclined to make purchase decisions. Age variable coefficient -0.0655, P value 0.000, are confirming age's impact. Occupation and shopping frequency are significant and positive. Consistent with Logit model preferred product category is significant in Probit model with P-value 0.044.

5.2.1. Summary

Analysis shows Logit and Probit models have similar impacts on key variables. Gender, age, occupation, shopping frequency, and shopping preference significantly affect users' purchasing

decisions. Gender and age have negative effects. Occupation and frequency have positive effects. Shopping preference has a negative effect. Preferred product category is significant in the Probit model. Logit and Probit models have strong explanatory power and consistent results. They help understand user characteristics' impact on decisions and assist enterprises in marketing and product positioning.

5.3. Model Index Evaluation

Model	AIC	BIC
Logit	186.8608916	261.9231001
Probit	185.5708612	260.6330697

Figure 8: AIC. & BIC.

From AIC and BIC perspectives, Logit model has AIC 186.861 and BIC 261.923; Probit model has AIC 185.571 and BIC 260.633. Lower values mean better data fitting considering model complexity illustrates in Figure 8. Probit model's values are slightly lower, suggesting it may be slightly better in data fitting but the difference is small. Both models are close for this dataset.

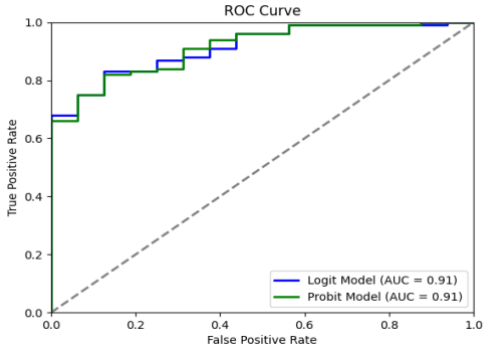


Figure 9: ROC curve. & AUC**.**

From ROC curve and AUC values, both models have AUC of 0.91. Their ROC curves nearly overlap. AUC close to 1 means good prediction. No significant difference in AUC shows little difference in classification performance shown in Figure 9.

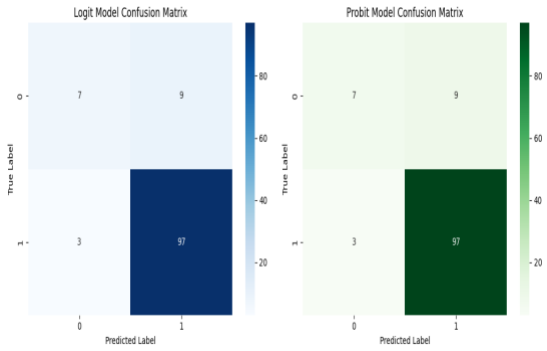


Figure 10: Confusion matrix

The confusion matrix analyzes the models' classification shown in Figure 10. For both models, the matrix results are the same: 7 TN, 9 FP, 3 FN, 97 TP. They behave similarly.

Model	F1 Score	Accuracy	Precision	Recall
Logit	0.941747573	0.896551724	0.91509434	0.97
Probit	0.941747573	0.896551724	0.91509434	0.97

Figure 11: Model Performance Metrics

The two models perform the same on all metrics as illustrates in Figure 11. The F1 score of 0.9417 shows a good balance. The accuracy rate is 0.8966. The accuracy is 0.9151. The recall rate is 0.97. The high consistency indicates little difference in their classification ability. Both models balance recall and accuracy well and classify most samples accurately.

5.4. Likelihood Ratio Test

The Likelihood Ratio Test result is 1.2900304236233353, showing the fitting difference between the Logit and Probit models. The test uses logarithmic likelihood value difference. The ratio is 1.290, meaning the models are similar in fitting. A larger ratio means a greater difference. But 1.290 is small, indicating no significant fit difference. Choosing either model has similar results. In practice, consider other factors for model selection. This agrees with previous analyses, confirming both models work well.

5.4.1. Summary

Overall, Logit and Probit models highly agree. Differences are small in fitting optimization, AIC/BIC comparison, and evaluations of ROC, confusion matrix, and classification indicators. Probit has slight advantages in some aspects but not significant. In practice, model choice can depend on efficiency, complexity, or application needs instead of performance differences. Both models can complete the classification task effectively on the current data set with equivalent effects.

6. SUGGESTION

In order to improve the cross-border e-commerce ecosystem of Shenzhen, platforms must prioritize transaction security by refining their security systems and conducting rigorous merchant evaluations, quality control, and intellectual property protection. By providing comprehensive data services, such as tools for market trend analysis, user insights, and sales data, businesses can make informed decisions. Expanding market reach will be facilitated by strengthening international partnerships and promoting enterprise collaboration through resource-sharing activities and communication platforms. Diversifying product offerings, adapting portfolios to market demand, enhancing brand identity through storytelling and active participation in industry events, and improving user experience through optimized logistics and website design are critical for brands and merchants. Visibility will be enhanced by increasing marketing initiatives through exhibitions, influencer partnerships, and social media. Furthermore, merchants should improve customer service by offering 24/7 availability, multilingual support, and simplified after-sales processes. On the other hand, consumers should make rational purchasing decisions based on their actual requirements, increase their awareness of risk prevention, choose products wisely, and safeguard their personal information by using trustworthy platforms and reviewing return policies.

7. CONCLUSION

In conclusion, utilizing both Logit and Probit models, the study examined the impact of Shenzhen's cross-border e-commerce platform on consumers' purchasing decisions, with an emphasis on critical demographic and behavioural variables. The analysis demonstrated that consumer behaviour was significantly influenced by gender, age, occupation, and purchasing frequency. For example, males were discovered to be 12% less likely to make purchases on the platform, whereas frequent shoppers exhibited a 23% higher likelihood of purchasing cross-border goods. The results also indicated that the Probit model provided a slightly superior fit for the data even though both models, Logit and Probit, performed similarly in predicting consumer decisions. These results provide critical insights into consumer dynamics in the cross-border e-commerce sector, underscoring the necessity for businesses to customize their strategies per demographic and purchasing behaviour trends to optimize customer engagement and sales potential.

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Cold Chain Distribution Path Optimization from the Perspective of Low-Carbon Multi-factor

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ABSTRACT
This paper delves into the intricate relationship between costs and carbon dioxide emissions in the cold chain logistics distribution process. It meticulously examines various factors that influence these emissions, including the flexible (soft) and inflexible (hard) time windows at distribution points, the condition of distribution roads, and how these elements collectively impact the overall efficiency of the cold chain logistics network. Furthermore, the study incorporates an analysis of China's current carbon emission trading policy, evaluating its implications for the low-carbon cold chain logistics landscape in the country. To achieve this, a robust mathematical analysis model is developed, aiming to minimize the total distribution costs while addressing the environmental challenges posed by carbon emissions. By applying a sophisticated design scheme and fitting algorithms, the research reveals optimal solutions that demonstrate how the total costs associated with cold chain logistics extend beyond mere distribution expenses. Notably, it highlights the potential for significant cost reductions through the application of an enhanced genetic algorithm, validating the effectiveness of the proposed model and the improved algorithmic approach. This comprehensive exploration not only sheds light on cost management strategies in cold chain logistics but also emphasizes the critical need for environmentally sustainable practices within the sector.

Keywords: Low carbon, Cold chain logistics, Distribution route optimization, Genetic algorithm

1. INTRODUCTION

In the past ten years, with the rapid development of China's economy, the cold chain logistics industry has entered a stage of rapid development in China. The study found that the cold chain industry's market demand and infrastructure construction have shown a growing trend. At the same time, the air pollution problem brought about by the cold chain industry should not be underestimated. In order to meet the requirements of the future development of a low carbon economy and to ensure the development of China's cold chain industry towards a healthy trend, it is necessary to realize green transformation (Ye & Zhao, 2022). In order to meet the requirements of the future development of a low carbon economy and ensure the healthy development of China's cold chain industry, it is necessary to realize the green transformation (Yang & Lo, 2024). Therefore, understanding the development of low-carbon cold chain logistics precisely and grasping how to reduce CO The release of the "14th Five-Year Plan" for the development of cold chain logistics signifies that China will make great efforts to promote the long-term development of cold chain logistics under the continuous development trend of the world. At the same time, the relevant departments of our government have put forward relevant policies emphasizing the need

to vigorously promote the rapid development of urban logistics and distribution, third-party logistics, and cold chain logistics in China. There is an urgent need to solve the potential problems of additional costs, higher consumption rates than other logistics distribution, and environmental pollution in the cold chain logistics distribution process. How to effectively call vehicles and adjust distribution routes in cold chain logistics and distribution is of great significance for realizing enterprise and social benefits.

2. LITERATURE REVIEW

Dantzig and Ramser (1959) proposed the Vehicle Routing Problem (VRP) 1959. With the rapid development of cold chain logistics in China, more and more scholars at home and abroad have conducted in-depth research on the VRP problem of cold chain logistics. The complexity of the workshop and improving the genetic algorithm, adding teaching and learning crossover in the crossover phase of the genetic algorithm improves the local search ability of the algorithm and, at the same time, adding self-adaptation to improve the global search ability of the improved algorithm, in response to the attention paid to carbon trading by scholars at home and abroad. Drawing on foreign experience, the slow development of China's carbon trading market and the lack of regulatory power is proposed, and the econometric model is used to propose an improvement program (Song et al., 2022).

It is proposed that under the dual-carbon target, the transportation industry welcomes the challenges and opportunities of transformation and development, and doing an excellent job in dual-carbon work is also an important project to promote the development of transportation construction in the 14th Five-Year Plan period (Siyuan et al., 2021). Nowadays, the coverage of green standards in the transportation industry is not in place, which means the market for low-carbon transformation has not yet been formed, and the research focus should be on the problem of unbalanced development that leads to the transformation of transportation. Efficient logistics and distribution services played an essential role in the beginning of the epidemic and the resumption of work and production after the improvement. However, the problems of low safety and poor quality of logistics services in the cold chain industry must be further strengthened and dealt with. Zhang et al. (2022) Introducing triangular fuzzy variables and setting a fuzzy time window, establishing an optimization model with the objectives of minimizing vehicle distribution cost and carbon emission cost, predicting the time window and solving the problem with a heuristic algorithm Under the premise of complying with the vehicle capacity and transit capacity, the distribution path is optimized, which reduces the transportation cost and carbon emission cost (Zhang et al., 2022). Cao et al. (2019) Used the principal component analysis (PCA) method and grey correlation analysis to construct a co-linkage model of low-carbon distribution and product coupling in the cold chain (Pan, 2021). The coupling mechanism of cold chain distribution under low carbon distribution is designed, and it is proposed that introducing the low carbon concept into cold chain logistics is of great practical significance. The carbon emission and integrating the green concept into the vehicle path optimization problem of cold chain logistics, a hybrid ant colony algorithm is constructed to minimize the total cost, and simulation optimization and comparative analysis are carried out to verify the model's effectiveness and the algorithm. Binet al. (2023) used the two-layer planning method (the upper layer is the government's goal, and the lower layer is the cold chain logistics enterprise's goal) to construct a system optimization decision-making model from a low-carbon perspective and solve the model with the chaotic particle swarm algorithm, which provides a basis for the enterprise's decision-making, and provides an idea for the energy

saving and emission reduction of the cold chain distribution link in the future. Cao et al. (2019) considered the multi-factor cost under the calculation of carbon emissions, with the minimum cost as the goal and used this to construct the cold chain logistics distribution path optimization, using a genetic algorithm to compare and solve the importance of considering carbon emissions. Shiet al. (2022), aiming at the actual situation of urban traffic congestion, a hybrid vehicle path planning model is constructed by considering multiple factors and solved by an improved ant colony algorithm, which proves that the hybrid vehicle path planning scheme meets the objectives and reduces the total distribution cost in a short period. Fang et al. (2019), an adaptive genetic simulated annealing algorithm, is used to construct a multi-vehicle path optimization model considering congestion index, carbon emission and customer satisfaction and to study the optimization of cold chain logistics paths with time windows.

The research found that low carbon has an essential value for the study of cold chain logistics distribution path. However, combined with examples of comparative research to improve the genetic algorithm at the same time to consider the low carbon perspective combined with the optimization of the cold chain path of multi-factor less, this paper combines the current carbon trading policy in China, in order to analyze the current stage of the cost of the cold chain logistics and distribution process and distribution of the total process of transportation, fuel consumption and cooling of the total amount of carbon dioxide produced. Amount to cold chain logistics company minimum total cost of establishing optimization objectives, and use the more improved genetic algorithm to solve the model. On this basis, taking the cold chain logistics distribution centre of Company A as an example, the results show that the algorithm model established by considering customer satisfaction and carbon emission can effectively control the carbon emission generated by the relevant cold chain logistics companies in China in the development, to achieve a high level of customer satisfaction and realize the goal of the lowest total cost.

3. MATHEMATICAL MODELING

3.1. Basic Assumptions Of The Model

Assumption 1, the vehicle is only responsible for delivering the product during the entire process, not for tasks such as pickup;

Assumption 2, the vehicle will not change the delivery task in the middle of the delivery process, and will not receive unexpected tasks such as midway assignments;

Assumption 3, a distribution center is surrounded by a sufficient number of user demand points;

Assumption 4, for each customer's demand point, the location and distance of the store location and distribution center coordinates are determined and known, and the quantity demanded at each user's demand point is known at the same time;

Assumption 5: During the vehicle delivery process, the goods at each user demand point are delivered at once and not in batches;

Assumption 6, the distribution center has enough refrigerated vehicles and meets the company's distribution requirements;

In Assumption 7, the refrigerated trucks for distribution start at the distribution center and end at the distribution center;

Assumption 8, to carry out distribution in the travel impedance impact parameters are determined and known, the vehicle distribution process travel speed is set to the average speed, the average speed is determined to be known and unchanged;

3.2. Definitions Related to Model Parameters

The significance of the relevant symbols in the mathematical model is shown in Table 1 below:

Table 1: Definitions of model-related symbol

Notation	Hidden meaning
V={0,1,2,…,n}	A collection of n customer points, with 0 being the distribution center
K={1,2,…,m}	Aggregate number of refrigerated trucks owned by distribution centers
G	Prescribed fixed cost per refrigerated truck (constant)
?	Transportation costs per kilometer of fuel consumption per refrigerated vehicle
P	Average unit economic utilization value of cold chain food during transportation
β_1	Spoilage rate of foodstuffs at specific temperatures during the distribution process
β_2	Consideration of food spoilage rates during loading and unloading
W	Prescribed refrigeration cost per unit area
R_1	Thermal conductivity of the compartments of refrigerated vehicles used for transportation
R_2	Heat transfer coefficient during loading and unloading
S_1	Heat transfer area of the compartment of a refrigerated truck
S_2	Heat transfer area of refrigerated trucks
T	Outside ambient temperature of transported refrigerated trucks
T_0	Temperature of commodities stored in compartments of refrigerated trucks

q_i	Demand at distribution point i
q_i^k	Weight of cold chain food remaining on refrigerated vehicle k at arrival at customer i
Q_m	Vehicle capacity of refrigerated trucks used for transportation
t_{ij}	Travel time of refrigerated vehicles from customer point i to customer point j, i.e., considering urban road impedances
α	The impedance impact parameter is 0.15
β	The impedance impact parameter is 4
Z	Impedance influence parameter, take the recommended value 11/21
t_i	Time spent by refrigerated vehicles servicing distribution point i
t_i^k	Time of arrival of refrigerated vehicle k at customer point i
ε_1	Penalty coefficients in case of early arrival at the client's point
ε_2	Penalty factor for failure to reach the client point in a timely manner
ε_3	Client time sensitivity factor
d_{ij}	Transportation distance between distribution point i and distribution point j
μ	Net weight of refrigerated truck
f_i^k	Vehicle load when refrigerated vehicle k arrives at distribution point i
H	Parameters related to distribution roads
η	Parameters related to refrigerated truck models
V	Vehicle travel speed
FC	Carbon emission factor

x_{ij}^k	0-1 are the decision variables, with x_{ij}^k = 1 when the kth refrigerated vehicle travels from customer point i to customer point j, and vice versa x_{ij}^k = 0.
y_j^k	0-1 are decision variables, y_j^k =1 when the kth refrigerated vehicle provides delivery service to customer j and vice versa y_j^k =0
$[e_i,\ l_i]$	Optimal service time window for distribution point i
$[E_i,\ L_i]$	Acceptable time window for distribution point i

3.3. Objective Function of the Mathematical Model

Constructing a mathematical model requires the objective function to be an important consideration. In this paper, when constructing the mathematical model, we not only consider the cost of loss of freshness of additional cold chain products in the distribution process and the cost of time penalty for delays, but also consider the cost of vehicle travel in the distribution process and the cost consumed by refrigeration and insulation of distribution refrigerated trucks. Here is a Mathematical model below.

1. Fixed costs (T_1)

$$T_1 = \sum_{k=1}^{K} g_k$$

2. Transportation costs (T_2)

$$T_2 = \sum_{k=1}^{K} \sum_{i,j=0}^{n} \lambda_k d_{ij} x_{ij}^k$$

3. Cost of refrigeration (T_3)

The cost of refrigeration during distribution:

$$T_3^{'} = \sum_{k=1}^{K} \sum_{i,j=1}^{n} WR_1 S_1 (T - T_0) t_{ij} x_{ij}^k$$

Refrigeration costs during handling:

$$T_3^{''} = \sum_{k=1}^{K} \sum_{i,j=1}^{n} WR_2 S_2 (T - T_0) t_i x_{ij}^k$$

Hence: cooling costs $T_5 = T_5^{'} + T_5^{''}$

$$T_3 = \sum_{k=1}^{K} \sum_{i,j=1}^{n} W(T - T_0)(R_1 S_1 t_{ij} + R_2 S_2 t_i) x_{ij}^k$$

4. Cargo damage costs (T_4)

The cost of cargo damage during distribution:

$$T_4^{'} = \sum_{k=1}^{K} \sum_{i,j=0}^{n} p q_i^k (1 - e^{-\beta_1 t_{ij}}) y_j^k$$

Consider road impedance travel time:

$$t_{ij} = t_0 (1 + \alpha (1 - (1 - \frac{k}{k_j})^z)^\beta)$$

The cost of cargo damage during loading and unloading:

$$T_4^{''} = \sum_{k=1}^{K} \sum_{i,j=0}^{n} p (q_i^k - q_i)(1 - e^{-\beta_2 t_i}) y_j^k$$

Therefore, the cost of cargo damage $T_4 = T_4^{'} + T_4^{''}$

$$T_4 = \sum_{k=1}^{K} \sum_{i,j=0}^{n} p[q_i^k (1 - e^{-\beta_1 t_{ij}}) + (q_i^k - q_i)(1 - e^{-\beta_2 t_i})] y_j^k$$

5. Time-waiting delay costs (T_5)

With a soft time window expression of:

$$C_{p2}(t_i^k) = \begin{cases} \varepsilon_1 (e_i - t_i^k), E_i < t_i^k < e_i \\ 0, e_i < t_i^k < l_i \\ \varepsilon_2 (t_i^k - l_i), l_i < t_i^k < L_i \end{cases}$$

$$x_{ij}^k = \begin{cases} 1, , i \neq j \\ 0, \end{cases}$$

So: the delayed cost of time waiting

$$T_5 = \sum_{k=1}^{K} \sum_{i,j=1}^{n} C_{p2}(t_i^k)$$

6. Total carbon emissions (C_2)

$$C_2 = \sum_{k=1}^{K} \sum_{i,j=1}^{n} F C_{ij} [h(\mu + f_{ij}) + \eta * v^2] d_{ij}$$

The objective function of the above constructed band mathematical model has been determined, next the user satisfaction and freshness of fresh products are taken into account in the constraints of the model, the mathematical model can be built as follows:

3.4. Objective Function

The objective function for minimizing the total cost of distribution using refrigerated trucks in a fresh food distribution center is mentioned in equation below and constraints divided into equation 1to 12 below.

$$\min c_1 = T_1 + T_2 + T_3 + T_4 + T_5 + C_2$$

Constraints

$$\frac{\sum_{i=1}^{n} U(S_i)}{n} \geq R \quad (1)$$

$$\sum_{k=1}^{K}\sum_{i=1}^{n} y_i^k = n, \forall i \in n, k \in K \quad (2)$$

$$\sum_{i=1}^{n} y_i^k q_i \leq Q_m, \forall i \in n, \forall k \in K \quad (3)$$

$$\sum_{i,j=1}^{n}\sum_{k=1}^{K} x_{ij}^k \leq K, i, j = 1,2,...,n \quad (4)$$

$$\sum_{i=0}^{n}\sum_{k=1}^{K} x_{ij}^k = 1, i = 1,2,...,n \quad (5)$$

$$\sum_{j=0}^{n}\sum_{k=1}^{K} x_{ij}^k = 1, i = 1,2,...,n \quad (6)$$

$$\sum_{j=1}^{n} x_{ij}^k = \sum_{j=1}^{n} x_{ji}^k \leq 1, i = 0, k = 1,2,...,K \quad (7)$$

$$[\sum_{k=1}^{K} Z_k \geq \sum_{k=1}^{K} d_k] = q \quad (8)$$

$$\{\max(t_i^k, e_i) + S_i + t_{ij}^k - t_j^k\} = 0 \quad (9)$$

$$f_i^k + \sum_{i=0}^{i-1} q_i = Q \quad (10)$$

$$C_{p2}(t_i^k) = \begin{cases} \varepsilon_1(e_i - t_i^k), E_i < t_i^k \\ 0, e_i < t_i^k < l_i \\ \varepsilon_2(t_i^k - l_i), l_i < t_i^k < L_i \\ \infty \end{cases} \quad (11)$$

$$U(S_i) = \begin{cases} \left(\frac{t_i - E_i}{e_i - E_i}\right)^{\varepsilon_3} E_i \le t_i < e_i \\ 100\% e_i \le t_i < l_i \\ \left(\frac{L_i - t_i}{L_i - l_i}\right)^{\varepsilon_3} l_i \le t_i < L_i \end{cases} \quad (12)$$

Equation 1 is the customer satisfaction constraint (R is a constant)

Equation 2 is the number of customers served is fixed to n;

Equation 3 is the sum of all customers' demand on the same distribution route is less than or equal to the maximum capacity of a single refrigerated vehicle;

Equation 4 is the prescribed route in which the prescribed vehicles do not exceed the total number of vehicles available to the company;

Equation 5 and 6 are the distribution points that can only receive the service of one refrigerated vehicle service;

Equation 7 for the specified route of each refrigerated vehicle: distribution center - to perform distribution tasks - return to the distribution center;

Equation 8 for each distribution point of the demand can be met;

Equation 9 for the distribution time is continuous, that is, to reach the customer point of the total time used for the vehicle's travel time and unloading at the customer point of the sum of time;

Equation 10 for the distribution point of the total time used for the vehicle's travel time and unloading at the customer point and; is that the load of the distribution vehicle is continuous;

Equation 11 is the constructed time window constraint;

Equation 12 is the customer's satisfaction constraint;

4. ALGORITHM IMPLEMENTATION

4.1. Genetic Algorithms

The main study of this paper belongs to the path optimization problem under multi-objective . In order to make up for the lack of stability of the genetic algorithm, this study adopts the adaptive cross-mutation improvement of the genetic algorithm solution mode, the core theme of the improved algorithm is "survival of the fittest, survival of the fittest", optimization through the cross-mutation reversal operation, so as to improve customer satisfaction, to achieve the lowest total cost, and to complete the least carbon emissions. The goal is to achieve the adaptability to the environmental constraints.

4.2. Improved Genetic Algorithm Design

Step 1: Natural number coding. Since the construction model studies the cold chain logistics distribution path optimization problem under low-carbon multi-factor, based on the improved genetic algorithm needs to be the distribution center and demand points for the natural number of coding, the code number of the distribution center is 0, respectively, for the 32 distribution demand points coded as 1, 2, 3, ..., 32. In the process of cold chain distribution, it is accordance with the specified driving route. Refrigerated trucks carry out orderly distribution according to the coding of 1-32 distribution points.

Step 2: Generation and expansion of the initial population (the initial population N=100 is set in this study). The initial population is generated in order to produce more feasible solutions in the known specified feasible domain, which refers to the size of the initial population on the one hand. After generating the initial population the process of chromosome generation is repeated according to the natural number coding method in step 1 to generate a randomized initial population N and then stops

Step 3: Determination of fitness function. The inverse of the total cost of the logistics and distribution pathway process considering the low carbon cold chain with multiple factors is determined as the fitness function in the improved genetic algorithm.

Step 4: Selection is performed. The selection operation is evaluated by the fitness value that has been determined in step 3, and the size of the fitness value is the criterion for performing retention and elimination. The individuals of the initial population (N=100) that has been generated are then sorted according to the size of the fitness value, with large fitness values being retained and small fitness values being screened for elimination.

Step 5: Perform crossover operation. In order to reduce the possibility of falling into a local optimum, the golden section method is added to the improved genetic algorithm, to avoid the possibility of falling into local optimization (Cao et al., 2019).

Step 6: Perform the mutation operation. Add the same golden section method as in step 5Adaptive crossover operation to perform mutation.

Step 7: Perform the reversal operation.

Step 8: Update population operation after crossover mutation reversal.

Step 9: Judge whether the stop condition is satisfied. If yes, end - output the optimal solution under the improved genetic algorithm, otherwise go to step 3 and repeat the operation until the stopping condition is satisfied.

5. SIMULATION EXPERIMENTS

5.1. Data Sources

According to the real working condition of A cold chain company, a set of data is simulated to verify, because A company has nearly one hundred stores in the area with the highest sales volume and several distribution centers, because there are too many stores, so this paper only assumes that A company is a little close to the city center of 32 stores as a distribution point and a distribution center as a reference for distribution simulation and optimization. The number 0 represents the distribution center, and the number 1-32 represents the store distribution points. In order to facilitate the statistics of fuel consumption and unified carbon emissions, the four refrigerated trucks responsible for cold chain distribution business in the logistics center of Company A are extracted, and the refrigerated truck model is the standard configuration of Jiangling New Shunda National Five 4.2 m refrigerated truck, and the vehicle model is: CLW5041XLCJ5. The horizontal and vertical coordinate positions of the distribution center 0 and the distribution points (1-32) are stipulated, and the demand of the distribution points, the soft and hard time windows, and the service time of each distribution point as shown in Table 2.

Table 2: Demand, time window and service hours for store demand points

(retail) store	Coordinate position	Demand/t	M1	M1	N1	N1	Service time/min
0	(80,80)	0	5.5	9.5	5	10	0
1	(40,66)	1	6	6.33	5.67	6.67	15
2	(56,30)	2	6.17	6.5	5.83	6.83	15
3	(99,45)	3	6.83	7.17	6.5	7.5	15
4	(110,70)	4	6.67	7	6.33	7.33	15

5	(10,30)	3	6.5	6.83	6.17	7.17	15
6	(40,48)	3	7	7.33	6.67	7.67	15
7	(30,95)	4	6.5	6.83	6.17	7.17	15
8	(78,33)	4	7.67	8	7.33	8.33	15
9	(130,135)	5	7.17	7.5	6.83	8.83	15
10	(30,130)	2	7.5	7.83	7.17	8.17	15
11	(45,14)	2	7.67	8	7.33	8.33	15
12	(156,100)	2	6.67	7	6.33	7.33	15
13	(99,100)	3	6.33	6.67	6	7	15
14	(125,30)	4	7.5	7.83	7.17	8.17	15
15	(135,120)	2	7.83	8.17	7.5	8.5	15
16	(110,15)	1	7.33	7.67	7	8	15
17	(45,125)	4	6.5	6.83	6.17	7.17	15
18	(99,80)	3	7.83	8.17	7.5	8.5	15
19	(20,35)	2	8.33	8.77	8	9	15
20	(99,120)	3	8.83	9.17	8.5	9.5	15
21	(80,44)	2	7.5	7.83	7.17	8.17	15
22	(105,16)	3	6.33	6.67	6	7	15
23	(145,23)	3	8.33	8.67	8	9	15

24	(140,121)	2	7.67	8	7.33	8.33	15
25	(130,85)	3	8.5	8.83	8.17	9.17	15
26	(20,18)	3	6.67	7	6.33	7.33	15
27	(22,50)	2	7.33	7.67	7	8	15
28	(50,70)	2	8.67	9	8.33	9.33	15
29	(55,85)	2	7.17	7.5	6.83	7.83	15
30	(88,100)	3	6.83	7.17	6.5	7.5	15
31	(110,88)	2	8.17	8.5	7.83	8.83	15
32	(65,45)	2	8	8.33	7.67	8.67	15

5.2. Analysis of Results

Based on the above experiments, the constructed mathematical model was solved using a more improved genetic algorithm. The parameters of the algorithm are as follows: the population size is 100, and the number of iterations in the improved genetic algorithm is 1000, and the improved genetic algorithm is realized by using the newer and more stable version of Matlab 2021b, and the results are shown in Figure 1. The improved genetic algorithm converges faster than the traditional algorithm in solving the optimization problem of low-carbon cold-chain logistics distribution paths, and to a certain extent reflects good solution results. The optimal result of the improved genetic algorithm is $801.46, which is a saving of $358.7695 compared with the previous optimal result run with the traditional genetic algorithm. The individual costs in the improved genetic algorithm are as follows: the distribution cost is $640.73, the carbon trading cost is $64.59, the reefer truck refrigeration cost is $38.33, and the time penalty cost is $57.81. Customer satisfaction based on time window is 0.72942.

The number of refrigerated trucks is 4, the total distance traveled by the vehicles is 164.8km, and the total load of the vehicles is 9.2t. The four refrigerated trucks are traveling according to the requirements of the specified routes, and the distribution routes are shown as follows:

Distribution route 1: 0->19->11->31->6->15->32->0

Distribution route 2: 0->20->25->24->23->28->0

Distribution route 3: 0->3->7->1->5->22->2->0

Distribution route 4: 0->8->30->27->12->21->26->13->17->10->16->4->29->9->14->18->0

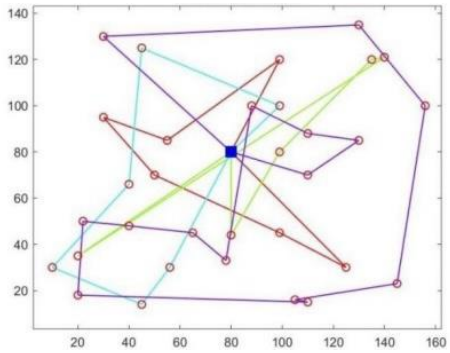

Figure 1: Optimal delivery route

6. CONCLUSION

This paper combines the current hotspot and the study of cold chain logistics vehicles in the distribution path optimization problem as the primary direction. It considers the carbon emissions and soft time window cost to arrange the vehicle scheduling of refrigerated trucks for reasonable distribution to minimize the total cost of the cold chain logistics distribution process as the research objective and considering the customer's satisfaction. In order to solve the shortcomings of traditional genetic algorithms that are prone to locally optimal solutions and early convergence, a more improved genetic algorithm is used to solve the problems of high carbon emissions in cold chain logistics and distribution and reduce the total cost of logistics. The study's results confirm that the optimal result of enterprise A based on the traditional genetic algorithm is 1160.2295 yuan. In comparison, the optimal result of the improved genetic algorithm is 801.46 yuan, of which the carbon trading cost considering carbon emissions is 64.59 yuan. Based on the cost reduction, it can be inferred that the improved genetic algorithm designed in the study can improve the shortcomings of the traditional genetic algorithm. It was found that the solution results under the consideration of carbon emission constraints are better than those of the traditional genetic algorithm, which provides a relatively valuable reference for solving the current optimization problem of the cold-chain logistics and distribution paths of enterprises in China.

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Li Yue Culture in Heluo Region: Inheritance Crisis and Vocational Education

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ABSTRACT

The rich tapestry of Li Yue culture, a significant component of Chinese traditional heritage, encompasses a profound historical background and intricate cultural meanings that resonate through generations. This study aims to delve into the pressing challenges faced in the inheritance of Li Yue culture within the Heluo area, while simultaneously exploring effective vocational education strategies to address these issues. Utilizing a qualitative research approach, the investigation engages a diverse sample comprising five key respondents, ten temporary information providers, and twenty general information providers, allowing for a comprehensive understanding of the subject. Data collection methods include meticulous interview records, insightful observations, and dynamic group discussions, culminating in a thorough descriptive analysis of both literature and field survey data. The findings reveal critical insights: The Li Yue culture in the Heluo area is confronted with significant threats from modernization, a stark deficiency in skilled inheritors, limited financial resources, and insufficient market engagement. In response to these challenges, the study advocates for the introduction of specialized courses in vocational colleges, the cultivation of dedicated teaching staff, enhanced school-enterprise collaborations, and the establishment of a vibrant campus culture. Notably, this research pioneers the exploration of Li Yue culture inheritance through the lens of vocational education, marking a significant contribution to existing literature. The implications of this study hold substantial value for practitioners involved in Li Yue skills inheritance, relevant vocational institutions, and local governmental bodies, offering a pathway to rejuvenate and sustain this vital cultural legacy for future generations.

Keywords: Heluo region; Li Yue culture; inheritance crisis; vocational education

1. INTRODUCTION

This research topic focuses on the Li Yue culture in the Heluo region, which is an integral part of Chinese traditional culture. The Heluo region refers to the Funiu Mountains with Luoyang as the centre, west to Tongguan and Huayin, east to Zhengzhou and Kaifeng, south to the upper reaches of the Ru River and Ying River, and north to the Yellow River to Jiyuan and southern Shanxi. It is the birthplace of Chinese traditional culture.

Li Yue culture is a comprehensive cultural system that originated from ancient Chinese society, with Li and Yue complementing each other and serving as the inside and outside of each other. Therefore, its central core is divided into Li and Yue. "Li" mainly refers to social norms, moral codes, behavioural rituals and hierarchy; "Yue" is an art form covering music performance, dance, poetry, musical instruments, music creation, and music education. Chen and Sensai (2023) pointed

out that Li Yue culture integrates moral norms with artistic expression, aims to cultivate people's moral sentiments, shapes social customs, and promotes social civilization and progress. It is an essential part of Chinese traditional culture and has a profound and lasting impact on the Chinese nation's values, thinking patterns and behaviour patterns.

However, with the development of the times and the acceleration of urbanization, the exchange and integration of world culture has caused the impact of various countries on Chinese traditional culture. People began to pursue more trendy and foreign cultures, and the influence of the ancient "Li Yue" concept in society gradually weakened. Through field investigation and literature review, researchers found that Li Yue's inheritance method can no longer meet cultural heritage's current inheritance and protection status. In addition, the severe ageing of inheritors, low participation of young people, and vague cognition of cultural values and connotations have also restricted the inheritance and innovation of Li Yue culture (Huang, 2012). The research on Li Yue culture mainly focuses on historical origins, cultural values, and ideological connotations. For example, Ho (2023) detailedly discussed the origin of Li Yue civilization, and Peng and Doar (2023) explored the ideological connotation of Li Yue culture in different eras. However, there are few studies on the various problems faced in the inheritance of this culture and how to solve this problem through vocational education strategies.

To sum up, this study aims to deeply explore the various problems in the inheritance of Li Yue culture in the Heluo area, propose effective vocational education strategies, provide new ideas and paths for the protection and inheritance of Li Yue culture in the Heluo area, and contribute new theoretical perspectives and practical references to the inheritance and protection of cultural heritage.

1.1. Research Objectives

1. To study the crisis faced by the inheritance of Li Yue culture in Heluo area.
2. To study effective vocational education countermeasures.

2. LITERATURE REVIEW

Previous research on Li Yue culture has accumulated rich results thatrevealingthe historical origins and cultural connotations of Li Yue culture and deeply explorings value in contemporary society. For example, Yan (2023)emphasized the critical position and value of the Li Yue civilization community in history in his paper and analyzed how it gradually transformed into a new form of human civilization with the development of the times, which may involve changes and evolutions in many aspects such as society, culture, and values, and provided a unique cultural perspective for understanding the development of civilization. Zhang (2018) believes that Li Yue culture has continuously absorbed nutrients in the process of historical development, kept pace with the times, maintained national stability and social stability, promoted national integration and achieved social harmony, and played an essential role in the development of feudal society. Today, when we advocate constructing a harmonious society, it still provides us with positive factors for reference. It has crucial contemporary value and research value in understanding ethics, cultivating self-cultivation, purifying customs, promoting harmonious social development, improving national quality, and cultivating national moral cultivation (Chen & Sensai, 2023). Li Yue's thought has a

solid implicit ideological and political education colour. It regulates people's emotions through various forms with order and distinction to achieve the ultimate educational goal of "benevolence". Discussing Li Yue's thoughts can provide sufficient guidance and inspiration for future implicit ideological and political education activities (He, 2023).

Regarding the role of vocational education in the inheritance of cultural heritage, Lin (2020) believes that incorporating cultural heritage inheritance into the modern vocational education system is a significant practical issue related to the inheritance of Chinese national traditional culture, and it is also a historical responsibility and primary mission that current vocational colleges must undertake and complete. Although the inheritance of intangible cultural heritage is still in the exploratory stage in vocational colleges, enriching and improving the school model of intangible cultural heritage inheritance by using modern apprenticeship is of great significance. Cultural heritage inheritance promotes the adaptive development of vocational education, while vocational education promotes the adequate cultural heritage inheritance. Because of the current dilemma of lack of teaching staff, lack of talent training model, and outdated inheritance form in the actual inheritance of cultural heritage, he proposed the realization path of building an excellent teaching staff, creating a distinctive talent training model, and pioneering innovative inheritance forms, in order to accelerate the pace of inheritance and protection, development and prosperity of cultural heritage, and open up new development space for cultural heritage inheritance. Lin (2020), taking art vocational colleges as an example, explored ways to integrate cultural heritage with art college courses. They believe that it is necessary to strengthen the construction of cultural heritage courses, create a new model of vocational cultural heritage inheritance education, rationally design teaching activities, implement the normalization of cultural heritage courses, integrate cultural heritage with subject courses, and run through the entire process of talent training, to achieve the organic integration of cultural heritage courses and education and teaching and enhance the awareness and ability of vocational college students to protect and inherit cultural heritage.

Although many achievements have been made in the research on Li Yue cultural heritage and vocational education, there are still some gaps and deficiencies in the current research. First, there are relatively few specialized studies on Li Yue culture in the Heluo region, especially the lack of in-depth research on the crisis faced by its inheritance and the coping strategies of vocational education; second, the existing research focuses on the cultural value or inheritance mechanism analysis of Li Yue itself, and there is little research on the specific role and implementation path of vocational education in cultural heritage inheritance; finally, there is a lack of systematic and comprehensive research that closely combines Li Yue inheritance with vocational education innovation.

3. RESEARCH METHODOLOGY

3.1. Research Methodology

This study adopted a mixed research methodology combining qualitative and quantitative research by collecting and analyzing quantitative data, including non-scaled questionnaires, and qualitative data, including interview transcripts and observation notes, in order to explore the research questions in a more comprehensive and multi-faceted way, and to integrate the strengths of the two research methods, so as to draw more comprehensive and accurate conclusions.

3.2. Population and Sample Group

This study involved a total of 35 respondents, all from Luoyang City, the core area of the Heluo region. They were divided into the following categories: 5 key respondents, including intangible cultural heritage inheritors, cultural experts and related scholars. 10 casual informants, all of whom are practitioners related to Li Yue culture. 20 general informants, who come from a wider community and have varying degrees of connection with this cultural phenomenon.

3.3. Research Tools

3.3.1. Literature Review

This study uses journals, professional books, and related articles to obtain information on the history, inheritance, identity, and cultural heritage dissemination of Li Yue culture, as well as some information needed for research. By analyzing the research results of predecessors, it provides relevant theoretical basis and methods for the development of this study.

3.3.2. Interviews

Interviews involve researchers collecting information and insights through informal conversation and dialogue. They are characterized by spontaneity and randomness. In this study, both closed-ended and open-ended questions were used, allowing participants to respond freely beyond predefined frameworks, thereby providing a diverse range of responses. While open-ended questions are easier to design, the process of analyzing the collected data can be time-consuming and complex. Conversely, closed-ended questions require more time to develop but enable participants to respond more easily and quickly. Throughout the study, observers need to document what people say, their experiences, and their perspectives.

3.3.3. Observations

The two main forms of observation used in this study are direct observation and participatory observation. During the research process, the direct observation method was used to observe the preparation and performance of Li Yue activities as a bystander and record relevant information. Participatory observation involves establishing close relationships with local residents, taking on certain roles, immersing oneself in daily life, and experiencing and observing the performance of Heluo Li Yue culture.

3.3.4. Group Discussions

Group discussion involves face-to-face conversations. During the research, the process of group discussion involved delivering pre-prepared questions related to Li Yue culture to group members, allowing them 2-5 minutes to prepare, ensuring that everyone can express their views and opinions, and recording the key points and details of the process in preparation for further data analysis.

4. DATA COLLECTION

4.1. Preliminary Investigation

The preliminary investigation of this study mainly adopted the literature survey method, obtaining domestic and foreign literature on the history and development of Heluo Li Yue through the online China Knowledge Network database, Google Scholar website and Luoyang Library, in order to provide useful information and basic theories for the research.

4.2. Observation Records

Observe and record during field trips, respect local festivals and customs, and integrate into their lives in order to obtain the most authentic discoveries. By recording their Li Yue activities and Li Yue-related performances, you can understand the true meaning behind the Li Yue culture.

4.3. In-Depth Interviews

Record different groups of people's understanding of Li Yue's related issues through notes, audio and video. This study obtained valuable information and research materials through interviews with the subjects. These questions need to be informed to the researcher before the interview. In addition to using electronic devices to record information, the questions can also be recorded in a notebook. The informant's name, gender, phone number, and address will also be recorded in case of later need.

4.4. Data Analysis

Data analysis refers to the process of using appropriate statistical analysis methods to analyze the data collected by the survey, extract useful information, form conclusions, and conduct detailed research and summary of the data. Data analysis can be used as an important argument to prove the subject's point of view. Objective and reliable, it is also an important basis for subject research.

Using data analysis is a very important process. This means performing appropriate analysis on the large amounts of data collected. This is the process of extracting useful information and conclusions and conducting a detailed study and summary of the data. In data statistics, it is necessary to describe the overall characteristics and basic characteristics of the data. And verify the results of data analysis by exploring changes in data. During this process, we should focus on discovering new features of the data and linking them to the results. Figure 1 illustrates the conceptual framework for the research on Li Yue culture in the Heluo region.

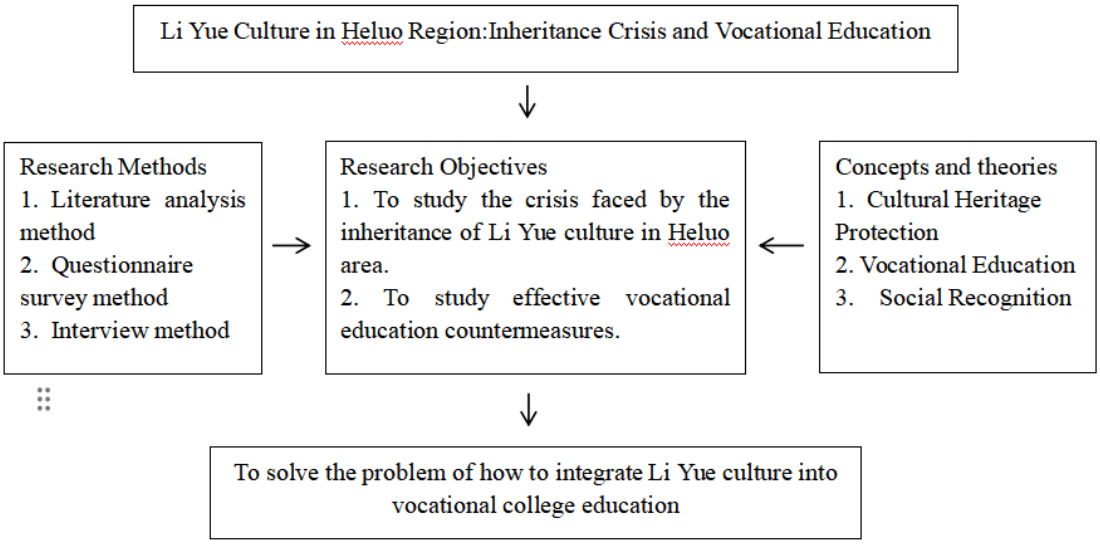

Figure 1: Conceptual Framework

5. RESULTS

5.1. Crisis Faced by the Inheritance of Li Yue Culture in Heluo Area

5.1.1. Severe Impact of Modernization

With the acceleration of modernization, Li Yue culture in the Heluo area faces unprecedented impact. With the rapid progress of science and technology and the advent of the information age, people's lifestyles and values have undergone tremendous changes. The popularity of modern entertainment methods such as movies, television, and online games has powerfully attracted people's attention, making the traditional Li Yue culture gradually marginalized in people's daily lives. Young people are more inclined to pursue fashionable, exciting, and diverse forms of entertainment, and they lack interest in and understanding of the ancient and solemn Li Yue culture. The rapid advancement of urbanization has also impacted the inheritance of Li Yue culture in the Heluo area. Large-scale urban construction and population migration have led to the gradual disappearance or change of many traditional communities and villages, and the original cultural and ecological environment has been destroyed. In cities, high-rise buildings and modern life rhythms have weakened people's connection with traditional culture. In addition, the focus of the modern education system is often on science and technology, practical skills, and examination subjects, and insufficient attention is paid to education and the inheritance of traditional culture. There is little content about Li Yue culture in the school curriculum, which leads to the lack of systematic learning and in-depth understanding of local culture in the younger generation during their growth, making it difficult for them to form a sense of identity and inheritance of Li Yue culture. The impact of this modernization has caused severe challenges to the inheritance of Li Yue culture in the Heluo region. Many traditional Li Yue rituals, performances, and skills have gradually declined or even been lost due to the lack of audiences and inheritance venues. Some

ancient music scores, dance scores and related literature are also in danger of being lost because no one cares about them.

5.1.2. Lack of Talents for Inheritance

In the inheritance of Li Yue culture in the Heluo region, the lack of talent is an urgent problem that needs to be solved. Due to the limitations of the inheritance method and the changes in the inheritance environment, young people are generally not willing to inherit Li Yue culture. Although the older generation of artists have superb skills, they are old and face the dilemma of no successors. Many young people believe that learning traditional Li Yue culture cannot bring stable economic income and good career development prospects, so they are unwilling to devote themselves to the cause of inheritance.

Therefore, due to the influence of modernization and the increasing pressure of life, many young people choose to leave their hometowns to seek development in big cities and are unwilling to devote themselves to the inheritance of Li Yue culture. This has led to the severe ageing of the inheritance team and the lack of fresh blood. The skills and knowledge of the older generation of inheritors are complex to inherit and develop effectively. Secondly, the inheritance of Li Yue culture requires long-term learning and practice, which requires a lot of time and energy. However, in the current fast-paced social environment, few people can be patient enough to concentrate on studying and inheriting this ancient culture. At the same time, inheritance work often cannot bring rich economic returns, discouraging many potential talents.

Furthermore, cultivating an excellent Li Yue cultural inheritor requires systematic education and rigorous training. However, the Heluo region currently lacks professional educational institutions and a complete training system and cannot provide strong support for cultivating inherited talents. Some existing inheritance methods are primarily oral and mental, lacking standardization and scientificity, quickly leading to deviations and omissions in the inheritance content.

Due to the lack of talent in inheritance, the Li Yue culture in the Heluo region has experienced discontinuity and deformation in the inheritance process. Some complex etiquette norms, exquisite performance skills and unique dance movements have been gradually lost, making it impossible to display the connotation and charm of Li Yue culture fully.

5.1.3. Funding Shortage

The development of inheritance activities requires a significant capital investment, including the protection of cultural heritage, the training of inheritors, the organization of cultural activities, the development of academic research, etc. However, due to the relatively low level of economic development in the Heluo region, limited government financial investment, and insufficient participation of social capital, the problem of funding shortage is more prominent.

On the one hand, Li Yue culture's protection, inheritance and development require a lot of capital investment. For example, the restoration and protection of ancient Li Yue cultural relics, the repair and maintenance of traditional Li Yue places, and the in-depth academic and cultural research require sufficient financial support. However, the government's financial investment is often limited, and it is challenging to meet all the needs. On the other hand, the participation of private

capital is not high. Since the inheritance projects of Li Yue culture usually cannot bring obvious economic benefits in the short term, they lack appeal to enterprises and individuals seeking a return on investment. Therefore, it is difficult to attract enough social funds to support the inheritance of Li Yue culture. The shortage of funds also leads to low economic treatment of inheritors, and their lives are not guaranteed, which affects their enthusiasm and initiative in inheriting culture. At the same time, it also limits the scale and quality of cultural inheritance activities. It is impossible to organize large-scale performances, exhibitions and training activities, purchase advanced equipment and props, and effectively promote and disseminate the skills of inheritors. In addition, the lack of funds also prevents some industries related to Li Yue culture from being effectively developed, such as cultural tourism and cultural and creative products. It is impossible to feed back cultural inheritance through the development of industries and form a virtuous circle.

5.1.4. Insufficient Market Development

The Li Yue culture in the Heluo region has not yet fully realized its potential in market development, and has failed to effectively use market mechanisms to achieve cultural inheritance and development. On the one hand, the lack of in-depth research and analysis of market demand has led to a disconnect between the supply of cultural products and services and market demand. For example, the design and development of some cultural products lack innovation and appeal, and cannot meet the needs and preferences of consumers. On the other hand, the single marketing and promotion methods, lack of brand building and marketing strategies, have limited the popularity and influence of the Li Yue culture in the Heluo region in the market. For example, in the tourism market, the tourism products of the Li Yue culture in the Heluo region have not been effectively integrated and promoted, and cannot attract more tourists to experience and consume.

5.2. Effective Vocational Education Responses

5.2.1. Curriculum Setting and Teaching Reform

Offer courses related to Li Yue culture in vocational colleges. Through the course of the cultural overview, the historical origins, development context, main content, and characteristics of Li Yue culture in the Heluo area will be systematically introduced. Let students fully understand the vital position and unique contribution of the Heluo area in the development of Chinese Li Yue culture through art courses, including teaching music, dance, etiquette performance and other aspects. Through practical teaching, students can experience the artistic charm of Li Yue culture in the Heluo area and improve their artistic accomplishment and performance ability. It can also be combined with professional courses to integrate Li Yue elements. For example, in the tourism major, Li Yue cultural tourism courses can be offered to introduce attractions and tourist routes related to Li Yue culture; in the hotel management major, Li Yue culture and hotel service courses can be offered to cultivate students to embody the qualities contained in Li Yue in hotel services.

5.2.2. Teacher Team Building

Strengthen the training of existing teachers, organize teachers to participate in training courses and academic seminars on Li Yue culture in the Heluo area, and improve teachers' professional quality and teaching level. Attract talents with a professional background in Li Yue culture to join the vocational education teaching team through recruitment and introduction. Support teachers in

applying for relevant scientific research projects, publishing academic papers, and improving their scientific research ability and academic level. You can also invite folk Li Yue inheritors in the Heluo area to enter the classroom to teach students traditional Li Yue skills and cultural connotations. Folk inheritors have rich practical experience and profound cultural heritage. Their participation can enable students to understand better the original flavour of Li Yue culture in the Heluo area. Moreover, it set up a folk inheritor studio in the school to provide a place for teaching and creation for the inheritors and also provide students with opportunities to communicate and learn with the inheritors. Select students with interest and potential, worship folk inheritors as teachers, conduct one-to-one apprenticeship teaching, and cultivate professional Li Yue cultural inheritors.

5.2.3. Practical Teaching and School-Enterprise Cooperation

Strengthen the practical teaching link, establish cooperative relations with museums, cultural centres, art groups, etc., in the Heluo area, establish a practical teaching base, and provide students with places and opportunities for practical teaching. In addition, it can also be expanded to traditional etiquette training centres, folk villages, historical and cultural blocks and other places. For example, in cooperation with folk villages, students can participate in etiquette displays and performances in traditional folk activities in the Heluo area and experience the inheritance and application of Li Yue culture in folk life. In the historical and cultural blocks, students can conduct field research, understand the etiquette regulations and cultural connotations in ancient buildings, and provide professional advice for protecting and inheriting these historical sites.

Deepen corporate cooperation and jointly develop Li Yue cultural products with the characteristics of the Heluo area. Design and produce traditional etiquette costumes, musical instruments, handicrafts, etc., in the Heluo area. Students can participate in the design, production, marketing, and other product links to improve their professional skills and innovation capabilities. At the same time, through the development and promotion of cultural products, it can also promote the dissemination and development of Li Yue culture in the Heluo area. Enterprises can also sign order-based training agreements with vocational colleges according to their development needs. The school formulates a particular teaching plan and curriculum system according to the requirements of enterprises to cultivate urgently needed Li Yue culture professionals for enterprises. After graduation, students can directly enter the enterprise to work, realizing the seamless connection between school and enterprise.

5.2.4. Campus Culture Construction

Build Li Yue culture theme squares, corridors and other landscapes on campus. Li Yue cultural performances and activities can be held regularly in the square; historical pictures and text introductions of Li Yue culture in the Heluo area can be displayed in the corridor. Through constructing these landscapes, students can feel the atmosphere of Li Yue culture anytime and anywhere on campus. Encourage students to set up Li Yue cultural student clubs, such as etiquette clubs, music clubs, classical dance clubs, calligraphy clubs, etc. Clubs can organize activities regularly, such as etiquette training, music performances, dance performances, calligraphy exhibitions, etc. Through club activities, students' interests, hobbies, and spirit of teamwork are cultivated, and they are provided with a platform to show themselves and create a robust Li Yue cultural atmosphere. In addition, theme education activities can be carried out, with Li Yue culture

as the theme, to carry out theme education activities such as patriotism education, traditional culture education, and moral education. For example, organize students to visit the patriotism education base in the Heluo area to learn about the history and culture of the Heluo area and enhance students' patriotic feelings; carry out traditional cultural classics recitation activities to allow students to learn and inherit the excellent traditional culture of the Heluo area; hold moral lectures, invite moral models to tell their own stories, and guide students to establish correct values and morals.

6. DISCUSSION讨论

The study found problems in Li Yue culture's inheritance, such as the severe impact of modernization, lack of inheritance talents, shortage of funds, insufficient market development, etc. In response to these problems, this paper proposes a strategy to incorporate Li Yue culture into the vocational education system, including setting up relevant majors, opening relevant courses, strengthening the construction of the teaching staff, deepening practical teaching and school-enterprise cooperation, strengthening campus culture construction, and highlighting cultural confidence and value identification education, to improve the inheritance level and social recognition of Li Yue culture, attract more young people to participate in inheritance, and achieve a win-win situation of cultural inheritance and economic development.

The current manifestation of the crisis of Li Yue cultural inheritance is the severe impact of modernization, lack of talent for inheritance, shortage of funds, and insufficient market development. This result is both similar and different from the research of Pan and Sirisuk (2023), who also pointed out that Li Yue inheritance has problems such as the impact of popular culture, a decrease in the number of inheritors, lack of interest among young people, and shortage of funds. However, this study found a difference between them through analysis; that is, insufficient market development cannot meet the needs and preferences of consumers. This problem is a unique finding of this study.

The development of the market economy and the acceleration of urbanization has led to the fact that the youngest people are studying or looking for jobs outside, and young people are receiving education and cultivation of modern culture, which has left the younger generation with no time to learn and train Li Yue culture and skills. The popularization of mass media has also reduced their interest and attention to Li Yue culture. The inheritance of Li Yue is mainly carried out by the middle-aged and elderly, and their age structure is ageing. The inheritors are old, and the inherited craftsmanship faces the dilemma of being lost. This echoes Zhang's (2018) analysis of the problems existing in the contemporary value embodiment of Li Yue.

In rapidly developing modern society, people pay increasing attention to practical material interests and efficient lifestyles. Traditional etiquette norms are often simplified or even ignored in fast-paced social scenes, and solemn music and dance forms are difficult to mainstream in the wave of popular culture. This undoubtedly increases the difficulty of inheritance for young people in modern, fast-paced life.

The curriculum of Li Yue culture is relatively few and unsystematic in school education. Except for some professional art colleges or cultural research institutions, there are few systematic Li Yue

cultural education contents in the curriculum of ordinary schools. Even if there are relevant courses, they are often elective courses or short-term cultural experience activities, lacking coherence and depth (Yan & Li, 2023).

In the teaching process of Li Yue culture, the teaching methods are relatively traditional and single, lacking innovation and appeal. Students passively accept knowledge, lack interaction and practice, and find it difficult to truly understand and feel the charm of Li Yue culture, resulting in low interest and enthusiasm in learning. This finding supports the results of Lin (2020) on the current status of integrating cultural heritage into ideological and political education in colleges and universities.

This study proposes strategies to integrate Li Yue culture into the vocational education system, including setting up relevant majors, opening relevant courses, strengthening the construction of the teaching staff, deepening practical teaching and school-enterprise cooperation, and strengthening campus culture construction. These strategies not only draw on the research results of predecessors, such as the strategies of Li Yue in education proposed by Pan & Sirisuk (2023) but also combine the actual situation of Li Yue in the Heluo region to propose more innovative solutions. The establishment of relevant majors aims to cultivate a new generation of inheritors through systematic and structured courses. This strategy not only helps to improve the professional skills of Li Yue masters but also strengthens their cultural identity and pride in Li Yue's culture.

In summary, from the perspective of research concepts, compared with previous studies, although the previous studies on Li Yue culture, inheritance protection, and vocational education have made outstanding achievements, there are relatively few special studies on the Heluo region and even fewer studies on the specific role of vocational education in the inheritance of cultural heritage and its implementation path. Therefore, the research lacks systematicity and comprehensiveness and cannot combine the inheritance of Li Yue culture with the innovation of vocational education.

The innovation of this study lies in the pertinence and comprehensiveness of applying research concepts. This study is the first to study Heluo Li Yue with the concept of vocational education, which is strong, rational, and relevant and can provide targeted guidance for the inheritance of local cultural heritage.

The limitation of this study is that the sample size is relatively small, although diverse, which may limit the generalizability of the research results. In addition, we focus on the Li Yue culture of the Heluo region, which means that the research results may not be directly applicable to other traditional crafts. Future research should involve a larger sample size and explore different cultural backgrounds to verify and expand these findings.

7. RECOMMENDATIONS

7.1. Theoretical Recommendations

Adopting a multidisciplinary research method, combined with the theories and perspectives of cultural anthropology, sociology, education, economics and other disciplines, a comprehensive review of the inheritance and development of Li Yue culture in the Heluo region is helpful to explore the complex social, economic and cultural factors behind the inheritance of Li Yue, and

provide theoretical support for the formulation of more scientific and reasonable protection strategies.

The concepts of conflict and negotiation can be used in the context of the inheritance of Li Yue culture in the Heluo region. Conflict in the inheritance of Li Yue culture in the Heluo region mainly refers to the various obstacles and contradictions encountered in cultural inheritance. Negotiation refers to seeking consensus and solutions to conflicts and differences. This process is particularly evident in the context of globalization.

7.2. Policy Recommendations

Vocational education institutions have an important responsibility, so they should formulate and implement comprehensive policies to support the inclusion of traditional crafts in vocational education courses. This includes establishing professional courses and subjects focusing on traditional culture in vocational colleges. The setting of these courses and subjects should fully consider the rich connotation and unique value of traditional culture and conduct in-depth exploration and systematic integration from multiple angles.

The government should encourage young people to engage in occupations related to traditional culture by providing financial incentives such as grants and subsidies. This would alleviate the economic pressure faced by these occupations and inject new vitality and impetus into the inheritance and development of traditional crafts.

Vocational colleges should actively seek opportunities for school-enterprise cooperation. On the one hand, it can provide students with more practical training opportunities so that they can better master the skills and essence of traditional crafts in actual operation and practice; on the other hand, it can also ensure that the relevant plans formulated by vocational education can be closely integrated with the actual needs of the industry, avoiding the embarrassing situation of disconnection between education and practice, and mismatch between talent training and market demand. In this way, the partnership between educational institutions and industry stakeholders is promoted, and vocational education plans are closely integrated with industry needs.

7.3. Practical Recommendations

Vocational schools should develop professional courses and teaching plans, such as "Li Yue Art Performance and Vocational Skills", combining music, dance, etiquette performance and other art forms in Li Yue culture to cultivate students' artistic performance ability and professional stage performance skills; "Li Yue Culture Early Childhood Education", for early childhood education majors, teaches students how to integrate Li Yue culture into early childhood education and cultivate children's moral cultivation, artistic literacy and social skills.

Modern vocational schools and enterprises can implement modern apprenticeships, select apprentices through interviews, talent shows, cultural knowledge tests, etc., and select students who have a strong interest in Li Yue culture and have specific artistic literacy and learning abilities as apprentices. Let experienced Li Yue practitioners lead young apprentices to ensure the smooth inheritance of skills.

Modern marketing methods, such as social media and e-commerce platforms, can enhance the popularity and market competitiveness of traditional culture and open up new economic opportunities for traditional craftsmen.

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Research on the Evaluation of Jiangsu Province's High-Quality Development Level Based on Entropy Weight TOPSIS Method

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ABSTRACT

This paper constructs an evaluation system for the level of high-quality development of Jiangsu Province based on the entropy weight TOPSIS method, including three index dimensions, namely, 'level of development of industrial structure', 'level of development of ecological environment' and 'level of development of urbanization'. The evaluation system includes three index dimensions: 'industrial structure development level', 'ecological environment development level' and 'urbanization development level'. After standardizing the indicators of different prefecture-level cities, the entropy weighting method is used to calculate the weights of the indicators, and then the TOPSIS method is used for comprehensive evaluation to obtain the comprehensive evaluation index and ranking of the high-quality development of each prefecture-level city. The results show that Suzhou City ranks first in Jiangsu Province in 2021, reflecting its outstanding performance in industrial structure, ecological environment and urbanization. The research in this paper provides reference and guidance for high-quality development in Jiangsu Province and other regions.

Keywords: High-quality development; Entropy weight TOPSIS; Comprehensive evaluation

1. INTRODUCTION

Since the 19th National Congress of the Communist Party of China (CPC) first put forward the new expression of high-quality development in 2017, the 20th National Congress of the CPC once again made it clear that high-quality development is the primary task of building a modern socialist country in an all-round way. The 3rd Plenary Session of the 20th Central Committee of the CPC, held from 15 to 18 July 2024, once again emphasized that high-quality development is the primary task of building a modern socialist country in an all-round way and proposed to lead reforms with the new development concept of innovation, coordination, greenness, openness and sharing, deepen supply-side structural reforms, and shape new dynamics and new advantages for development.

Furthermore, as a significant economic province, Jiangsu Province must play a pioneering role in leading the way. We should implement the new development concept entirely and accurately, continue to be an exemplary leader in reform and innovation, promote high-quality development, strive to be a model in serving the country to build a new development pattern, take the lead in realizing socialist modernization, make breakthroughs in scientific and technological innovations,

show new roles in strengthening and supplementing the chain and extending the chain, explore new experiences in building a modern civilization of the Chinese nation, and realize new achievements in modernizing the governance of the society. We will make breakthroughs in science and technology innovation, make new achievements in strengthening and supplementing chains, explore new experiences in building a modern civilization of the Chinese nation, and achieve new achievements in promoting the modernization of social governance.

Therefore, to have a better plan for the subsequent development of Jiangsu, it is necessary to assess the level of high-quality development in Jiangsu Province accurately. The evaluation system of the level of high-quality development is different due to the different evaluation objects and perspectives, and the respective evaluation index systems are also different. As early as the initial concept of 'high-quality development' and 'new development concept', Ding and Gu (2018) constructed an evaluation index system for the 'five development concepts'. Based on this system, they used grey correlation theory to analyze the relationship between scientific and technological innovation drive and high-quality economic development from the perspective of its intrinsic correlation. After collating relevant evaluation index systems at home and abroad, Li et al. (2019) constructed a high-quality development evaluation index system with economic vitality, innovation efficiency, green development, people's life, social harmony and five significant categories of indicators from the perspectives of 'people's need for a better life' and 'unbalanced and inadequate development' in the main contradiction of China's society. Based on the connotation of high-quality development, Su and Chen (2019) selected six items as the first-level indicators of their high-quality development evaluation index system, namely, 'quality and efficiency improvement', 'structural optimization', 'transformation of kinetic energy', 'green and low-carbon', 'risk prevention and control' and 'improvement of people's livelihood' as the first-level indicators of its high-quality development evaluation index system, and based on this, it conducted a comprehensive evaluation of the high-quality development of 31 provincial-level administrative regions across the country. Based on these indicators, a comprehensive evaluation of the high-quality development of 31 provincial-level administrative regions across the country was conducted.

The perspective of high-quality development of new urbanization constructed an evaluation index system from five dimensions: industry, green, society, space and life, and used the improved entropy method to comprehensively evaluate the level of high-quality development of new urbanization in 31 provinces in China in the decade 2010-2020 (Xu, 2024). The perspective of urban innovation used the frontier distance method, three-stage DEA model, and coupling coordination degree model to conduct a comprehensive analysis to explore the evolution law of spatio-temporal coupling between urban innovation efficiency and high-quality development level within the urban agglomeration (Shi et al., 2024). Pan and Yang (2024) analyzed the high-quality development of the construction industry. They constructed an evaluation index system for the high-quality development of the construction industry, followed by a comprehensive assessment of the high-quality development of the construction industry in the Yangtze River Delta region from 2014 to 2021 using the entropy-weight-TOPSIS method. Based on high-quality development, previous literature has used different methods to conduct comprehensive evaluations from different perspectives and for different targets. Based on the entropy weight TOPSIS method, this paper constructs an evaluation system that includes three major categories of indicators: ' industrial structure development level', 'ecological environment development level' and 'urbanization

development level'. The selection of these three categories of indicators covers the core elements of economy, environment and society and reflects the comprehensive and multidimensional characteristics of high-quality development. Through this evaluation system, the level of high-quality development of Jiangsu Province can be comprehensively and scientifically assessed and, simultaneously, provide a reference for the high-quality development of other regions.

2. CONSTRUCTION OF A HIGH-QUALITY DEVELOPMENT INDICATOR SYSTEM

This paper constructs an indicator framework for assessing the level of high-quality development in Jiangsu Province. Table 1 shows the index system for evaluating the level of high-quality development of each prefecture-level city in Jiangsu Province.

Table 1: Evaluation Indicator System for High Quality Development Level of Prefecture-level Cities in Jiangsu Province

Target layer	Guideline layer	Indicator layer	Nature of indicators
High-quality level of development	Level of development of industrial structure	Total GDP (hundred million yuan)	+
		Primary industry output (hundred million yuan)	+
		Secondary industry output (hundred million yuan)	+
		Tertiary industry output (hundred million yuan)	+
		GDP per capita (yuan)	+
		Fixed investment in the primary industry, represented by agriculture, animal husbandry and fisheries (hundred million yuan)	+
		Fixed investment in the secondary industry, represented by the manufacturing sector (hundred million yuan)	+
		Fixed investment in the tertiary industry, represented by the accommodation and catering industry (hundred million yuan)	+
		Area afforested in the current year (ha)	+

Level of ecological development	Forest cover (%)	+
	Capacity of industrial wastewater treatment facilities (ten thousand t/d)	+
	Comprehensive use of industrial solid waste (ten thousand t)	+
	Industrial fume (dust) emissions (ten thousand t)	-
	Carbon footprint (ten thousand t)	-
	Sulphur dioxide emissions (ten thousand t)	-
Level of urbanisation development	Number of resident urban population (ten thousand persons)	+
	Urbanisation rate of the resident population (%)	+
	Population with tertiary education and above (ten thousand persons)	+
	Built-up area of municipal districts (km^2)	+
	Density of the motorway network (km/km^2)	+
	Expenditure on research and experimental development (hundred million yuan)	+
	Local fiscal expenditure /General public budget expenditure (hundred million yuan)	+
	Consumption level of urban residents/ Disposable income per capita of urban residents (yuan)	+

3. DATA SOURCES AND RESEARCH METHODOLOGY

3.1. Descriptive Statistics and Data Sources

In this paper, the data of 13 prefecture-level cities in Jiangsu Province for 2019-2021 are taken and analysed, and the data of each indicator are obtained from the China Statistical Yearbook and the statistics database of CEIC. Table 2 shows the descriptive statistical analysis of each indicator.

Table 2: Results of descriptive statistics for variables

Name	Sample volume	Minimum	Maximum	Average	Standard deviation
Total GDP (hundred million yuan)	13	3719.011	22718.340	9022.577	5660.679
Primary industry output (hundred million yuan)	13	130.330	743.340	363.215	199.190
Secondary industry output (hundred million yuan)	13	1648.430	10872.810	4067.223	2621.514
Tertiary industry output (hundred million yuan)	13	1704.030	11655.800	4607.617	3202.638
GDP per capita (yuan)	13	74476.000	187415.000	132539.850	39563.487
Fixed investment in the primary industry, represented by agriculture, animal husbandry and fisheries (hundred million yuan)	13	3.670	122.046	35.888	35.174
Fixed investment in the secondary industry, represented by the manufacturing sector (hundred million yuan)	13	506.359	4021.678	2199.242	1094.252
Fixed investment in the tertiary industry, represented by the accommodation and catering industry (hundred million yuan)	13	593.691	4606.780	2129.443	1254.346
Area afforested in the current year (ha)	13	135.000	7387.000	1630.492	1964.478
Forest cover (%)	13	11.830	31.900	25.556	4.729
Capacity of industrial wastewater treatment facilities (ten thousand t/d)	13	22.596	331.500	96.286	77.157

Comprehensive use of industrial solid waste (ten thousand t)	13	217.990	2822.000	937.187	723.592
Industrial fume (dust) emissions (ten thousand t)	13	0.180	5.422	1.354	1.480
Carbon footprint (ten thousand t)	13	1712.790	13229.420	4087.409	3124.134
Sulphur dioxide emissions (ten thousand t)	13	0.205	2.162	0.646	0.525
Number of resident urban population (ten thousand persons)	13	256.990	1052.620	483.762	238.908
Urbanisation rate of the resident population (%)	13	62.380	86.900	72.555	8.315
Population with tertiary education and above (ten thousand persons)	13	89.834	494.961	289.281	109.612
Built-up area of municipal districts (km^2)	13	147.290	868.280	367.354	227.435
Density of the motorway network (km/km^2)	13	0.022	0.082	0.053	0.019
Expenditure on research and experimental development (hundred million yuan)	13	7.946	776.456	195.989	228.450
Local fiscal expenditure /General public budget expenditure (hundred million yuan)	13	534.180	2583.700	1026.016	600.265
Consumption level of urban residents/ Disposable income per capita of urban residents (yuan)	13	35056.330	76888.200	54734.238	13833.930

3.2. Comprehensive Evaluation Model For High-Quality Development

In evaluating and comparing the level of high-quality development of different prefecture-level cities in Jiangsu Province, the entropy weight TOPSIS method provides a systematic and objective way, and this distance-based comparison is not only easy to calculate, but also produces logically coherent and easy-to-understand results. The combined use of Entropy Weight TOPSIS skilfully blends the objectivity of the Entropy Weight method with the intuition of TOPSIS, ensuring both the rationality of weight allocation and the transparency of the evaluation process and the reliability

of the results, and providing a powerful tool for multi-dimensional assessment of high-quality development. The basic steps are as follows:

In the first step, the measurement data of all indicators were preprocessed using the method of standardisation of extreme deviations, thus eliminating differences in orders of magnitude and units among the indicators in the evaluation system. This process ensures that indicators of different magnitudes can be fairly compared on the same scale, thus improving the accuracy and comparability of the evaluation results. It is expressed as follows:

$$Y_{ij} = \begin{cases} \dfrac{X_{ij} - min(X_{ij})}{max(X_{ij}) - min(X_{ij})}, & X_{ij}\text{为正向指标} \\ \dfrac{max(X_{ij}) - X_{ij}}{max(X_{ij}) - min(X_{ij})}, & X_{ij}\text{为负向指标} \end{cases}, \tag{1}$$

where *i* denotes prefecture-level cities, *j* denotes indicators, and X_{ij} and Y_{ij} denote the evaluation indicators of the high-quality development level of each prefecture-level city in Jiangsu Province before and after standardisation.

In the second step, the information entropy E_j is calculated based on the standardised assessment indicator Y_{ij}:

$$E_j = \ln\frac{1}{n}\sum_{i=1}^{n}\left[\left(Y_{ij}/\sum_{i=1}^{n}Y_{ij}\right) ln\left(Y_{ij}/\sum_{i=1}^{n}Y_{ij}\right)\right]. \tag{2}$$

In the third step, the weight W_j of each evaluation index value Y_{ij} in the evaluation system is calculated according to the above derivation:

$$W_j = (1 - E_j)/\sum_{j=1}^{m}(1 - E_j). \tag{3}$$

In the fourth step, the weighting matrix $\mathbb{R}$ of the evaluation indicators is constructed:

$$\mathbb{R} = (r_{ij})_{n\times m}, \tag{4}$$

where $r_{ij} = W_j \times Y_{ij}$.

In the fifth step, the optimal solution T_j^+ and the worst solution T_j^- are determined:

$$T_j^+ = (maxr_{i1},\ maxr_{i2},\ \cdots,\ maxr_{im}), \tag{5}$$

$$T_j^- = (minr_{i1},\ \ minr_{i2},\ \ \cdots,\ \ minr_{im}). \tag{6}$$

In the sixth step, the Euclidean distances d_j^+ and d_j^- are calculated for each of the evaluated scenarios and the optimal scenario T_j^+ and the worst scenario T_j^-:

$$d_i^+ = \sqrt{\sum_{j=1}^{m}\left(T_j^+ - r_{ij}\right)^2}, \tag{7}$$

$$d_i^- = \sqrt{\sum_{j=1}^{m}\left(T_j^- - r_{ij}\right)^2}. \tag{8}$$

In the seventh step, the high-quality development evaluation index C_i is calculated:

$$C_i = \frac{d_i^-}{d_i^+ + d_i^-}, \tag{9}$$

where $C_i \in [0,1]$, the larger its value means the better the evaluation of the high-quality development of the prefecture-level city.

4. COMPREHENSIVE EVALUATION OF THE LEVEL OF HIGH-QUALITY DEVELOPMENT OF PREFECTURE-LEVEL CITIES IN JIANGSU PROVINCE

4.1. Analysis of Evaluation Indicator Weights

Table 3 shows the table of weights calculated by the entropy method for the evaluation indicators of the high quality development level of each prefecture-level city in Jiangsu Province, which gives the information entropy value E_j and the weight coefficient W_j of each indicator calculated according to the entropy method, and it can be seen from the table below that, among these indicators, the level of development of industrial structure and the level of urbanisation development play a bigger impact on the high quality development of each prefecture-level city in Jiangsu Province, and the level of ecological development is relatively weaker but also plays a big supportive role. relatively weaker influence on their high-quality development level, but also played a great supporting role.

Table 3: Table of weights calculated by entropy value method for evaluation indexes of high quality development level of each prefecture-level city in Jiangsu Province

Guideline layer	Indicator layer	Information entropy E_j	Weighting coefficients W_j	Guideline layer weighting coefficients
Level of development of industrial structure	Total GDP (hundred million yuan)	0.8067	6.19%	39.78%
	Primary industry output (hundred million yuan)	0.8634	4.38%	
	Secondary industry output (hundred million yuan)	0.8061	6.21%	
	Tertiary industry output (hundred million yuan)	0.7988	6.44%	
	GDP per capita (yuan)	0.8966	3.31%	
	Fixed investment in the primary industry, represented by agriculture, animal husbandry and fisheries (hundred million yuan)	0.8053	6.24%	
	Fixed investment in the secondary industry, represented by the manufacturing sector (hundred million yuan)	0.9162	2.68%	
	Fixed investment in the tertiary industry, represented by the accommodation and catering industry (hundred million yuan)	0.8649	4.33%	
Level of ecological development	Area afforested in the current year (ha)	0.7569	7.79%	22.23%
	Forest cover (%)	0.9650	1.12%	
	Capacity of industrial wastewater treatment facilities (ten thousand t/d)	0.8495	4.82%	
	Comprehensive use of industrial solid waste (ten thousand t)	0.8433	5.02%	
	Industrial fume (dust) emissions (ten thousand t)	0.9618	1.22%	
	Carbon footprint (ten thousand t)	0.9649	1.12%	
	Sulphur dioxide emissions (ten thousand t)	0.9644	1.14%	
Level of urbanisation development	Number of resident urban population (ten thousand persons)	0.8148	5.93%	37.99%
	Urbanisation rate of the resident population (%)	0.8668	4.27%	
	Population with tertiary education and above (ten thousand persons)	0.9349	2.09%	

	Built-up area of municipal districts (km^2)	0.8250	5.60%
	Density of the motorway network (km/km^2)	0.9186	2.61%
	Expenditure on research and experimental development (hundred million yuan)	0.7877	6.80%
	Local fiscal expenditure /General public budget expenditure (hundred million yuan)	0.7675	7.45%
	Consumption level of urban residents/ Disposable income per capita of urban residents (yuan)	0.8988	3.24%

4.2. Comprehensive Evaluation of the Level of High-Quality Development of Prefecture-Level Cities in Jiangsu Province

Taking 2021 as the year of horizontal evaluation, through the calculation and comparison of entropy weight TOPSIS method, as shown in Table 4, this paper obtains the comprehensive evaluation scores and rankings of the level of high-quality development of each prefecture-level city in Jiangsu Province in 2021, and there are also the subdivided scores and rankings of each prefecture-level city in each criterion layer.

Table 4: Evaluation and Ranking of the High-Quality Development Level of Prefecture-level Cities in Jiangsu Province, 2021

City	Comprehensive evaluation		Level of development of industrial structure		Level of ecological development		Level of urbanisation development	
	Score	Ranking	Score	Ranking	Score	Ranking	Score	Ranking
Suzhou	0.624	1	0.625	1	0.453	2	0.911	1
Nanjing	0.508	2	0.517	2	0.255	5	0.731	2
Xuzhou	0.425	3	0.337	7	0.647	1	0.256	5
Wuxi	0.361	4	0.421	3	0.208	7	0.399	3
Nantong	0.300	5	0.372	5	0.141	11	0.327	4
Yancheng	0.283	6	0.386	4	0.182	9	0.195	8
Huaian	0.277	7	0.368	6	0.236	6	0.133	11

Changzhou	0.245	8	0.277	8	0.207	8	0.238	6
Lianyungang	0.214	9	0.226	10	0.295	4	0.115	12
Zhenjiang	0.205	10	0.113	13	0.296	3	0.202	7
Yangzhou	0.193	11	0.244	9	0.119	13	0.185	9
Taizhou	0.165	12	0.205	11	0.122	12	0.151	10
Suqian	0.138	13	0.160	12	0.161	10	0.084	13

As can be seen from Table 4, Suzhou is the first prefecture-level city in Jiangsu Province with the highest quality development level in 2021, while Nanjing, Xuzhou and Wuxi are ranked second, third and fourth, respectively. Firstly, Suzhou's high-tech industries and industrial parks make its industrial structure development level rank first; secondly, even though Suzhou's industries continue to develop, its ecological environment development level is among the top 13 prefectural-level cities in Jiangsu Province, second only to Xuzhou. Lastly, Suzhou's level of urbanisation, supported by its counties and cities, is also firmly in the first place. On the other hand, Nanjing has a slight gap with Suzhou in terms of its high-quality development level score due to its relatively average ecological environment development level. Xuzhou's excellent ecological environment development level and its high-quality development level force Wuxi to rank third; it is reported that by 2021, Xuzhou's forest coverage will be sixteen years in a row, the province's first. Wuxi and Nanjing have the same problem, resulting in the ranking of Xuzhou. From back to front, Jiangsu Province's high-quality development levels ranked in the last four are Zhenjiang, Yangzhou, Taizhou, and Suqian, belonging to the Northern Jiangsu region.

Regarding regional distribution, the evaluation results of the level of high-quality development of prefecture-level cities in Jiangsu Province do not show too noticeable a difference between the 'Southern Jiangsu region', 'Central Jiangsu region' and 'Northern Jiangsu region'. For the South Jiangsu region, Suzhou and Nanjing, the overall level of high-quality development is higher, but the level of Changzhou is in the middle of the level; for the Central Jiangsu region, Yangzhou, Zhenjiang, Taizhou, the indicators are in the middle and lower levels; for the Northern Jiangsu region, Xuzhou's level of high-quality development of the better, but Yancheng, Lianyungang, Suqian, the indicators are in the middle and lower levels.

Table 5: Comprehensive Evaluation of High-Quality Development in Jiangsu Province, 2019-2021

Year	Score	Ranking
2019	0.190	3
2020	0.390	2
2021	0.814	1

Table 6: Comprehensive Evaluation and Ranking of High-Quality Development of Prefecture-Level Cities in Jiangsu Province, 2019-2021

City	2021		2020		2019	
	Score	Ranking	Score	Ranking	Score	Ranking
Suzhou	0.624	1	0.640	1	0.649	1
Nanjing	0.508	2	0.561	2	0.533	2
Xuzhou	0.425	3	0.391	3	0.373	3
Wuxi	0.361	4	0.376	4	0.373	4
Nantong	0.300	5	0.330	5	0.329	5
Yancheng	0.283	6	0.324	6	0.324	6
Huaian	0.277	7	0.297	8	0.319	7
Changzhou	0.245	8	0.251	9	0.233	9
Lianyungang	0.214	9	0.303	7	0.289	8
Zhenjiang	0.205	10	0.169	13	0.180	12
Yangzhou	0.193	11	0.229	10	0.211	11
Taizhou	0.165	12	0.178	12	0.178	13
Suqian	0.138	13	0.218	11	0.231	10

From the vertical timeline, Table 5 shows the comprehensive evaluation of the overall high-quality development of Jiangsu Province in 2019-2021, and Table 6 shows the comprehensive evaluation and ranking of the high-quality development of each prefecture-level city in Jiangsu Province in 2019-2021. From the two tables, it can be found that the overall high-quality development level of Jiangsu Province is improving year by year. Secondly, from the perspective of prefecture-level cities, among the first four prefecture-level cities, the comprehensive evaluation ranking of high-quality development has not changed, but the comprehensive scores of high-quality development of Suzhou, Nanjing and Wuxi in 2021 are not as good as those in 2020 or even 2019, while Xuzhou's high-quality development in 2021 is significantly higher than that of the previous two years; and among the five middle prefectures, the high-quality development of the three years in the comprehensive ranking has a slight fluctuation, and Nantong, Yancheng, Huaian, Lianyungang in 2021, the comprehensive score of high-quality development in 2021 is similarly compared with 2020 and even 2019 declined; and for the latter four prefectural-level cities, the rankings of each other have their own order, in which Zhenjiang's level of high-quality development is rising year by year, but Suqian, on the contrary.

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

By analyzing the level of high-quality development of 13 prefecture-level cities in Jiangsu Province, this paper applies the entropy weight TOPSIS method to construct a set of scientific evaluation systems, which helps comprehensively assess each prefecture-level city's development status. The study shows that Suzhou, Nanjing and Xuzhou are outstanding in high-quality development. Specifically, Suzhou, relying on developing high-tech industries and industrial parks, ranks first in the province in industrial structure development and has achieved remarkable ecological environmental protection and urbanization results. Xuzhou's remarkable results in ecological environment construction are an essential reason for its rising ranking in high-quality development. In contrast, Nanjing has a gap with Suzhou in its high-quality development score due to its more general level of ecological environment development.

Regarding spatial distribution, the level of high-quality development does not show apparent regional differences between Southern Jiangsu, Central Jiangsu and Northern Jiangsu. Although the overall development level in Southern Jiangsu is high, Changzhou's performance is only medium, indicating that even in developed regions, the development of individual cities still needs attention and improvement. Xuzhou City in the north of Jiangsu Province has driven the overall development level with its excellent ecological environment construction. In contrast, other cities in the north of Jiangsu Province, such as Yancheng City and Lianyungang City, have performed relatively average, showing unbalanced development within the region.

Longitudinally, the overall level of high-quality development in Jiangsu Province has been increasing between 2019 and 2021. However, in the specific performance of individual prefecture-level cities, there is still a need to be wary of declining scores, especially in Nanjing and Wuxi, whose scores in 2021 are lower than those in 2020, suggesting fluctuations in the development process. Overall, the research in this paper provides a valuable reference for high-quality development in Jiangsu Province and other regions while also emphasizing the importance of balancing economic growth with environmental protection and social development. In the future, Jiangsu Province should continue investing more in scientific and technological innovation, industrial optimization and ecological protection to achieve a more coordinated and sustainable high-quality development.

5.2. Managerial recommendations

5.2.1. Optimising Industrial Structure

Jiangsu Province should continue to promote the development of high-tech industries and modern service industries, especially in the southern part of Jiangsu Province, to further optimise the industrial structure and enhance the added value and competitiveness of the industries.

5.2.2. Strengthen Ecological Construction

In terms of environmental protection, prefecture-level cities should take Xuzhou City as an example, strengthen ecological environment management, enhance industrial pollution management and promote green development.

5.2.3. Promote Urbanisation

For areas with a low level of urbanisation, urban infrastructure construction should be strengthened, public service capacity should be upgraded, population agglomeration in cities should be promoted, and integrated urban-rural development should be promoted.

5.2.4. Coordinated Regional Development

To address the problem of unbalanced development within regions, Jiangsu Province should promote the economic development of central and northern Jiangsu, enhance the industrial competitiveness and innovation capacity of these regions, and promote the coordinated development between regions.

5.2.5. Enhancing Innovation Capacity

Strengthen investment in scientific research and talent cultivation throughout the province, especially in Nanjing and Suzhou, and continue to give full play to their advantages in scientific and technological innovation to drive technological progress and industrial upgrading in the province.

Through these measures, Jiangsu Province can play a greater leading role in high-quality development and provide experience and demonstration for high-quality development across the country.

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The Suffering of Life

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ABSTRACT

This study investigates the emotional impact of modern urban existence, focusing on pain, helplessness, and resilience in today's fast-paced, economically driven society. This project addresses the pervasive human experiences of anxiety, struggle, and uncertainty, amplified by economic challenges, job instability, and material pressures. Using woodcarving and resin as mediums, the artist applies sculpting and casting techniques to develop textured surfaces that convey raw emotional intensity. Contrasting forms, including exaggeratedly bloated or emaciated body parts, represent inner conflict and vulnerability, evoking a visceral depiction of human hardship. The study synthesizes data from environmental observations and visual arts influences, which inform the symbolic and technical choices that deepen the portrayal of resilience and adversity. The Suffering of Life encourages a profound engagement with the human condition by presenting pain as an abstract and physical reality. The work prompts viewers to see and feel the weight of these emotions through concrete imagery, bold textures, and strong contrasts, inviting contemplation on existence, resilience, and the complexities of human life. The artwork ultimately transforms pain into a relatable experience that resonates with the audience, prompting reflections on the fragility and strength inherent in life's challenges.

Keywords: Urbam Life , Suffering, Sculpture

1. INTRODUCTION

With the deepening of reform and opening up, China's economy has achieved remarkable accomplishments, lifting hundreds of millions of people out of poverty and propelling China to become the world's second-largest economy. New economic structural reforms have emerged as a pivotal driving force (Lin, 2011). To foster more efficient and rapid development, China has gradually adopted and integrated certain principles and mechanisms from Western capitalist market economies to facilitate the transformation and optimization of its domestic economic structure (Katzenstein, 1976). One direct consequence of this transformation is the proliferation of numerous economic zones in major cities. These economic zones tend to attract many enterprises and industries, thus becoming hotbeds for economic growth. The establishment and expansion of these zones attract significant investments and drive an influx of individuals into these areas. This acceleration in urbanization processes due to the emergence and expansion of economic zones has led to rapid urban growth with increased population density. Such swift urbanization processes have altered people's lifestyles and imposed higher demands on urban infrastructure and public services. As individuals migrate into cities, particularly into economic zones, for employment purposes, their way of life undergoes dramatic changes (Portes, 2010). To cope with soaring living

costs and fierce competition, individuals must work harder to attain better income and social status. However, such high-intensity work-life dynamics pose challenges to both physical well-being and mental health.

The high population density has exerted significant pressure on the urban environment. Issues such as limited housing space, traffic congestion, and air pollution have become increasingly prominent. Simultaneously, the fiercely competitive work environment intensifies psychological stress among individuals and contributes to social instability (Hilgartner & Bosk, 1988).

1.1. Research Objectives

1. To study the state of suffering, attachment, and people's way of life in urban society.

2. To create sculptures using human figures in poses that express the suffering of life.

2. METHODOLOGY

It is creative research. Collect documents and field data by observing and recording images, then analyze and interpret the data to create creations. It is using concepts and theories of art creation combined with imagination. The creative process begins with sketching. The basics of shapes and artistic possibilities that can respond to creative ideas lead to creating real works through sculpting clay and casting with resin. Presentation of research results in descriptive analysis. With sculptures, Writing supporting documents, and publishing research articles in academic journals in standard databases.

3. RESULTS

3.1. Artistic Outcomes

The sculpture depicts a distressed man clinging to a geometric form, conveying a materialistic life. The pained expressions and gestures of lifting geometric shapes suggest the inherent struggle and contradiction between material pursuits and spiritual satisfaction. Geometric shapes represent physical or social oppression and symbolize knowledge and responsibility. The man vividly depicts his inner turmoil, stress and helplessness by holding up geometric shapes. The sculpture perfectly captures the character's painful expression and muscle tension through exquisite carving techniques, enhancing the visual impact and creating a deeper emotional connection with the viewer (Chen & Yang, 2023). The man's twisted gesture of vigorously raising his hands contrasts with the regular shapes of the geometric form, effectively emphasizing the harrowing themes depicted in this article. By depicting his painful expression and the action of picking up a geometric shape, he successfully resonated with the audience, reminding us that while pursuing material wealth, we must pay attention to our inner needs and spiritual pursuits to avoid falling into endless turmoil (Mathews, 2013).

This mixed-media art creation uses shapes, materials, techniques, and methods. It mixes ideas, Feelings, and imagination that can convey the inner state of the researcher. The creative process is as follows.

3.2. Interpretation of Sculptures

By observing life and collecting material images, sketching becomes an indispensable step in sculptural art creation. A profound and exaggerated world is constructed using sketching to capture the forms and poses of different characters and transform them into the stretching and deformation between the tumbler figure and the bottom oval (Buchmann Galerie, n.d.). In this real world, people can examine themselves, explore the continuation of human nature, and reveal every decadent moment behind the hardships of life. Therefore, in the face of difficulties, we should maintain the indomitable spirit and strong will like a tumbler. The image of the tumbler is intertwined with her life experiences and social thinking. It gradually evolves into a way of expressing the spirit of life, eventually transforming into a stainless steel sculpture that is innocuous yet cold, compassionate yet cold-hearted (Cladel, 1917). The sketches and computer graphics in Figures 1, 2, 3, and 4 illustrate interpretations of sculptures analyzed within a specific social and cultural context.

Figure 1: Sketch Drawing and Computer Graphic 1

Figure 2: Sketch Drawing and Computer Graphic 2

Figure 3: Sketch Drawing and Computer Graphic 3

Figure 4: Sketch Drawing and Computer Graphic 4

Sculpture art is analyzed in the specific social and human cultural environment, and the relationship between the artworks and the background of The Times, social concepts, and people's cultural lifestyle is discussed. By revealing this correlation, we can have a deeper understanding of the meaning and value of art in society at that time.

3.3. Thesis Work 1

3.3.1. Idea/ Concept

This piece shows the instability of life, the insecurity as shown in Figure 5.

3.3.2 Form

The Tumbler figure stretches, deforms and combines with the oval shape at the bottom to embody the indomitable spirit and tenacious will of living in a painful society.

3.3.3. Meaning

A state of life caused by stress, competition, rushing, and attachment to the materialism of life in an urban society.

Figure 5: Thesis Work 1

3.4. Thesis Work 2

3.4.1. Idea/ Concept

Expressing the suffering state of hard struggle in life, bearing the burden of life struggle, living in the materialistic society of material flow, as shown in Figure 6.

3.4.2. Form

It uses the character's posture to bear or be affected by the physical world, represented by the geometry of large square bars. The human form represents a rough surface. It gives a dynamic feeling of movement and pain.

3.4.3. Meaning

It reflects the state that people are not easy to rush about for life.

3.4.4. Progress

Changed the shape to have a structure that was more relevant to the reality of the human anatomy. and creating a figure with a pose that directly represents the struggle of living life that conveys the idea of life's suffering.

Figure 6: Thesis Work 2

3.5. Thesis Work 3

3.5.1. Idea/Concept

Expressing the suffering state of hard struggle in life, bearing the burden of life struggle, living in the materialistic society of material flow, as shown in Figure 7.

3.5.2. Form

It uses the posture of the character to bear or be affected by the physical world, represented by the geometry of large square bars. The human form represents a rough surface. It gives a dynamic feeling of movement and pain.

3.5.3. Meaning

It reflects the state that people are not easy to rush about for life.

3.5.4. Progress

Because the second piece fell. So adjust the posture to be different and create a pose that has a relationship with the second piece. Arrange the elements of the pose so that they are coordinated.

Figure 7: Thesis Work 3

3.6. Thesis Work 4

3.6.1. Idea/ Concept

Expressing the suffering state of hard struggle in life, bearing the burden of life struggle, living in the materialistic society of material flow, as shown in Figure 8.

3.6.2. Form

It uses the posture of the character to bear or be affected by the physical world, represented by the geometry of large square bars. The human form represents a rough surface. It gives a dynamic feeling of movement and pain.

3.6.3. Meaning

It reflects the state that people are not easy to rush about for life.

3.6.4. Progress

Its shape is designed so that an adult can directly bear heavy objects. To create a sense of life in which humans rely heavily on materialism.

Figure 8: Thesis Work 4

4. DISCUSSION

4.1. Artistic Reflection

This study presents creative issues consistent with the current world situation, focusing on economic growth rather than pursuing the value of human life. Communicating through the sculptural form with an agonizing pose tied to the object in a straightforward shape thus directly affects the perception and aesthetics of art.

4.2. Social Implications

Through these works of mine, we can gain insight into the genuine reactions of human beings when faced with difficult situations. To resist and struggle with all your strength reflects the tenacity and perseverance of human beings in the face of difficulties and challenges and is the most glorious side of human nature. The fear and despair in the sculpture are also part of human nature. Faced with overwhelming forces, humans feel fear and despair. However, this kind of fear and despair is not negative. They can inspire human beings' desire for survival and resistance.

Every moment, every choice, every pain and joy in life is repeated ad infinitum. Sculptures of painful life figures can be seen as manifestations of this idea of eternal recurrence. Through the painful expressions and postures of the figures in the sculptures, we are reminded of the impermanence and repetitive pain of life, thus triggering in-depth thinking about the meaning and value of life. This sculpture inspires an appreciation of the uniqueness and meaning of life, the treasury of every experience, and the concept of eternal reincarnation (Morey, 1918).

The painful life portrait sculptures show the pain and despair of the characters and believe that the essence of life is pain and dissatisfaction. Desire is the root of pain because desire is always unsatisfied, causing people to continue to feel pain in the pursuit. Jamison (2003) suggests that, much like Rodin's sculptures, capturing the true essence of life means looking beyond what is

visible on the surface. It is about peeling back the layers to understand the daily challenges people navigate. This view reminds us that real empathy goes beyond just seeing someone's struggles; it requires us to grasp the often-hidden complexities and pressures that shape their experiences in today's fast-moving, high-stress world. My sculptures lead us to reflect on the nature of desire and how to find the balance between desire and pain. It encourages us to pursue inner peace and contentment beyond material pursuits to alleviate life's pain.

4.3. Audience Reception

By showing the painful state of life caused by pressure, competition, hurry, and attachment to materialism in urban society through sculpture works, the audience can be inspired to reflect deeply on the lifestyle and values of modern society. The audience can resonate through its unique form of expression and strong emotional conveyance. The audience may realize that they have also experienced similar pain and struggle under the pressure of urban life, thus better understanding and accepting their own emotional experiences, reflecting on their attitudes towards life and values, and starting to think about whether they are also bound by materialism, whether they are too much in pursuit of external success and achievements and ignore their inner needs and feelings. In the face of the challenges of pain and pressure, this work can inspire the audience to find balance in life. The audience may realize that besides work and material pursuit, there are other more important things, such as health, family, friendship, and spiritual satisfaction. By adjusting their lifestyle and finding a balance between their inner and outer worlds, people may be able to reduce pain and improve their quality of life. Sculpture works with the theme of pain can also arouse the audience's sympathy and care. The audience may realize that in this busy society, many others are experiencing the same pain and struggle (Chen & Yang, 2023). By paying attention to others, lending a helping hand, and working together to build a warmer and more inclusive society, people may be able to alleviate each other's pain and create a better future together.

5. CONCLUSION

This study delves into the profound intricacies of human experience, especially within the complexities of modern urban life. Inspired by Auguste Rodin's perspective that a true sculptor captures not just the physical form but also the essence of life itself, this work seeks to illuminate the significant challenges individuals face in today's society. The sculptures created serve as poignant reflections of the emotional struggles and turmoil that arise in a world increasingly defined by material pursuits.

Through the dynamic poses and rich textures of these figures, we engage with the tension between the external demands of our environment and the inner quest for peace and fulfilment. Each shape and form resonates deeply with viewers, inviting them to confront their experiences of pain and desire and the constant struggle to find balance in their lives. In an age where material gain often overshadows the value of human connection, these artistic expressions prompt critical reflection on what it means to exist genuinely.

Ultimately, this study underscores the indispensable role of art in shedding light on the complexities of the human condition. It encourages us to reflect on our journeys, adversities, and the resilience we cultivate to pursue meaning. Through the lens of sculpture, we are reminded that

amidst life's chaos, there is beauty in our shared experiences. Together, we possess a collective strength that can guide us toward a more compassionate and fulfilling existence.

6. FUTURE RECOMMENDATION

Consider embracing concrete figures alongside geometric shapes to express the depths of painful emotions in your sculptures effectively. By varying the forms, lines, and volumes, you can vividly convey feelings of discomfort and anguish. When you juxtapose these geometric elements with realistic figures, you create striking contrasts and resonances that enhance the richness of your artwork.

It is also essential to begin by fully recognizing and understanding the pain that life brings. This awareness can serve as a powerful catalyst for personal growth and transformation. As we confront our struggles, we can better appreciate the inherent value of human nature and the resilience that emerges from our experiences.

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The Flower of Goodness

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ABSTRACT
This article, The Flower of Goodness, is inspired by a mother's pure love for her child and aims to 1) explore how to express the ideals born from this love and 2) create visual art that embodies the "flower of goodness." Through field studies and literature reviews, data were analyzed for content, form, materials, and technique, merging theoretical principles with imagination to uncover artistic possibilities. The creative process began with pencil sketches of daylilies, lotuses, and jasmines, combined with Chinese characters from ancient poems, nursery rhymes, and traditional blessings expressing maternal love and hope. The installation comprises three sections: five fabric panels hanging in layered pathways, a circular mosquito net encasing a lotus sculpture and jasmine garlands, and a central large lotus sculpture, uniting all elements. White fabric and embroidered yarn evoke the tradition of mothers crafting clothes for their children, while flowers symbolize virtues like goodness, love, and respect. Chinese characters from poetry and teachings convey a mother's deep wishes for her child. The 2D floral patterns on fabric, circular net, 3D lotus sculptures, and soft, warm-coloured embroidery evoke purity, warmth, and gentleness. This immersive experience brings ancient Chinese literature into fine art through contemporary methods, achieving aesthetic value—through form, composition, and light—and humanistic value by celebrating the universal ideals of motherhood, compassion, and nurturing love.

Keywords: Mother’s love, Goodness, Mother's Day Flowers, Mixed Media Arts

1. INTRODUCTION

Since ancient times, maternal love, as a universal and deep emotion, has occupied a pivotal position in human society and culture. Since the 18th century, the ideology of maternal love has flourished in the 19th century and continues to this day. Influenced by the ideology of motherly love, this concept is embedded in educational books, literary works and artistic creations and has become part of society and culture (Anton, 2020). In various cultures, a mother's love for her child is accorded a high status and is regarded as a supreme emotion.

A mother's love is a deep emotion; it may not be publicized, but it can bring endless warmth and strength. It may be a look, an action or an everyday word from a mother in life. There is a classic painting, "Mencius' Mother Moved Three Times", in traditional Chinese painting, depicting the scene of Mencius' mother moving constantly to provide a suitable environment for her son to grow up. The maternal love and teachings behind it are deeply imprinted in the picture, highlighting the vital role of maternal love in the growth of children (Smith, 2004).

When I was young and saw my mother busy, I did not realize the responsibility and pressure she was under. At that time, I, like a bystander, could not understand that for the family, for me to pay the hard work and sacrifice. However, when I became a mother, the role shift opened me up to new perspectives and experiences. I watched my child grow from a baby in swaddling clothes to an independent individual who stepped into his life circle. This process is full of laughter and tears, challenges and growth. Every day and night with our children, we learn together and make progress together from the initial hope that the child can be healthy and happy to expect him to have a bright future gradually, our wish for his growth and continue to sublimate. This transformation is a good hope for our children's future and reflects our growth and progress as parents. Now, I can understand my mother's effort and hard work. Every time I see my mother calmly talking about the surgical scar on her stomach, I understand that it is a selfless love, a firm responsibility, and a determination to make unremitting efforts for the happiness of children and families (Wong, 2023). This inspired me to create mixed media art about the goodness of motherly love.

1.1. Objective

1. To study the ideals about the goodness that comes from a mother’s pure love for child.

2. To create the visual arts with form mater and creative methods that convey the goodness of a mother’s love for child.

1.2. Scope of Creation

1.2.1. Content

It is about the ideals of goodness that come from a mother’s pure love of child.

1.2.2. Form

Use the form of flowers to present ideals of goodness and poetry, nursery rhymes, and that express the love and relationship of a mother for child.

1.2.3. Techniques

Use embroidery techniques using yarn and to embroider to on thin white fabric. To connect to the relationship between a mother's love for child.

2. CONCEPTUAL FRAMEWORK

Visual art is created through language, form, materials and techniques. The concept of the flower of goodness is intended to present a sensual experience through visual art. This flower connects emotions gently and feels the beauty in the language of contemporary art (Paoliello, 2020). The image conveys the mother's awareness of purity, warmth and nurturing love for her child through materials, light, shadows, and detailed installations. Moreover, it conveys the value of humanity and celebrates the essential value of motherhood. Figure 1 shows the concept of the Framework.

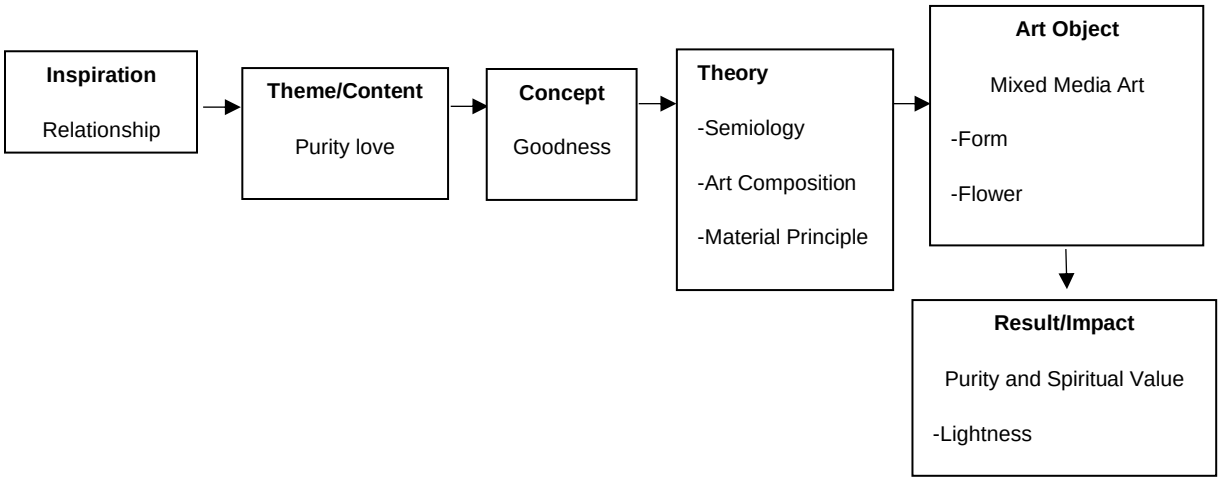

Figure 1: Conceptual of Frame Work

3. METHODOLOGY

3.1. Data Collection

3.1.1. The Importance of Mothers

Collect documentary data from various sources to explore the significance of mothers, the celebration of Mother's Day, and the cultural symbols associated with motherhood, particularly flowers that represent mothers in different cultures. This includes understanding the emotional depth of maternal love and the societal appreciation of mothers across different traditions.

3.1.2. Poetry, Nursery Rhymes, and Storytelling

Gather data related to poetry, nursery rhymes, and storytelling that express the profound love and relationship between mothers and their children. Focus on elements within Chinese literature, including nursery rhymes and storytelling traditions, that highlight the grace and unconditional love of a mother. For example, consider Meng Jiao's *Song of the Parting Son*, which poignantly captures a mother's care as she prepares her son for travel, symbolizing her fears and hopes. The poem illustrates the themes of maternal affection and the deep bond between mother and child (Meng Jiao, n.d.).

3.1.3. Chinese Faith and Symbolism

Investigate the significance of Guanyin Bodhisattva in Chinese culture. This being represents compassion and motherhood. The lotus flower symbolizes purity and maternal love, reflecting the belief in the endless mercy bestowed upon humanity.

3.2. Field Data

Collect field data from specific regions to study the characteristics and cultural meanings of flowers that symbolize motherhood in China. This may involve observing local practices, gathering firsthand accounts, and understanding how different flowers are utilized in celebrations of motherhood, particularly during occasions like Mother's Day or other familial gatherings.

This approach will provide a comprehensive understanding of the multifaceted roles of mothers in different cultures, the artistic expressions that celebrate them, and the symbolic flowers that reflect their importance, as shown in Figures 2, 3, and 4.

Figure 2: Jasmine garland for respecting the mother of Thailand (Love You Flower, n.d.)

Figure 3: Guanyin Bodhisattva Painting

Figure 4: Orange Daily Flower

3.3. Data Analysis

3.3.1. Content Analysis

This analysis focuses on delving into the concepts and purposes of creativity as expressed through various forms of artistic representation. We can uncover deeper meanings and intentions behind creative works by examining how different elements come together.

3.3.2. Form Analysis

This section interprets the symbolic use of three types of flowers—daylily, Lotus, and Jasmine—to convey specific content and emotions. Each flower acts as a vessel for expression, complemented by incorporating Chinese characters derived from ancient poems, nursery rhymes, and heartfelt words that mothers often share with their children. This blend of floral symbolism and linguistic heritage enriches the narrative of maternal love and connection.

3.3.3. Material and Technique Analysis

The primary material used in the creations is white cloth, which symbolizes purity and innocence, akin to the fabric mothers traditionally used to make clothes for their children. Yarn is then embroidered onto this fabric, reflecting the intricate care and craftsmanship that mothers devote to their families.

Artificial jasmine flowers serve as an honoring tribute to mothers, symbolizing the beauty and admiration associated with maternal figures.

3.3.4. Technique

Embroidery techniques are employed to stitch yarn onto the delicate white fabric, representing the unbreakable bond between a mother and her child. Additionally, the creation of a lotus sculpture involves draping white cloth over a bamboo structure, signifying resilience and the nurturing qualities of motherhood, as shown in Figure 5.

3.4. Creative Process

The creative journey begins with sketching the initial ideas in your imagination. Using simple lines, the aim is to translate these abstract concepts into tangible forms. Following this, the creative process unfolds through embroidery techniques applied to thin white fabric. The final stage involves systematically documenting the creative ideas and processes, leading to the publication of the work in academic journals and national databases, thus contributing to the broader discourse on maternal love and its artistic representations. Sketches of work 1, 2, 3, 4 and sketch for the allover view are shown in Figures 6, 7 and 8 below.

Figure 5: Material for creation

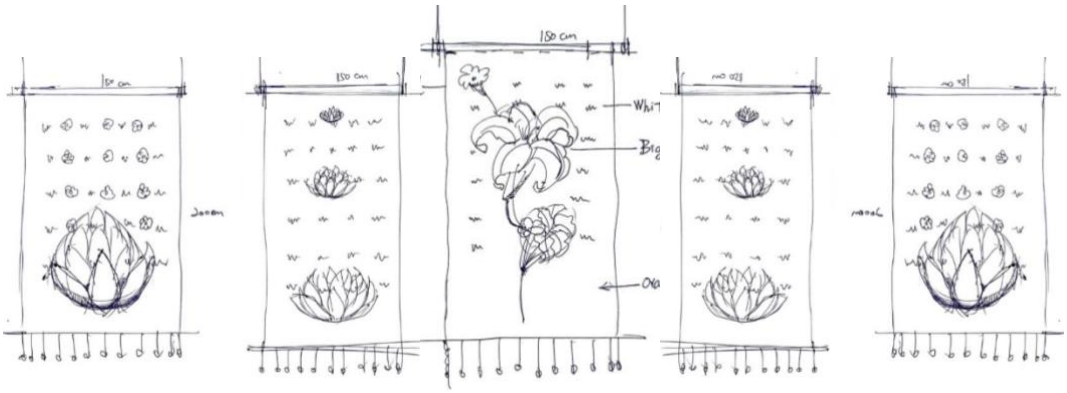

Figure 6: Sketch for Work 1 and 2

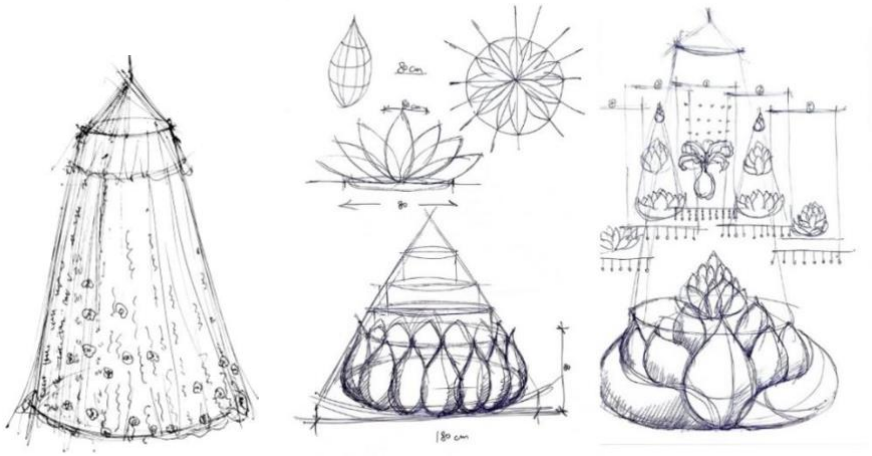

Figure 7: Sketch for Work 3 and 4

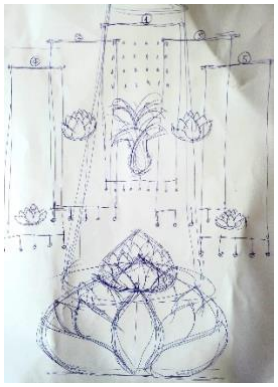

Figure 8: Sketch for Allover View

4. SUMMARY OF CREATIVE RESULTS

Creation of mixed media art set The Flower of Goodness uses embroidery techniques using yarn to embroider on thin white fabric combined with Readymade Objects such as artificial jasmine flowers and a circular mosquito net. The researcher proceeded with the creative process in sequence. Until the process is completed, the work is analyzed with illustrations to show the results of creativity, aesthetics, Visual elements, form, appearance and Interpretation. Which will reflect the results achieved according to the objectives of the creation. Presentation of the analysis results has the following points:

4.1. Artwork 1

4.1.1. Theme and Concept

The flower of goodness.

4.1.2 Form

Embroider a Daylily Flower form with yarn in the center of the fabric. It is a large form. Use orange and green to match the color and leaves of the Daylily. Both sides are embroidered with Chinese characters. It is an ancient poem that praises the grace of mothers. At the bottom of the cloth hung a string of artificial jasmine flowers. Hang them in alternating heights and lows slightly to make a feeling of movement.

4.1.3. Material and Technique

Embroider to on thin white fabric and hung a string of artificial jasmine flowers.

4.1.4. Installation and Presentation

Hanging from the ceiling, Installed in the center of all works and setting at back layer.

4.1.5. Results of Creativity

Rectangular white fabric suspended from the ceiling and gently dropped down. It is set to be installed at the centre of all the work. Large Daylily flowers are planted in the middle of the canvas for prominence and as a background for other works. Make artwork stand out. Meanwhile, the orange colour of the embroidery thread creates a bright, warm glow, while the surrounding Chinese characters are covered with white and light yellow thread and at the bottom of the fabric hung threads with artificial Jasmine flowers. With the essence of each type of material, It comes from yarn. Therefore, there is harmony. They convey an awareness of flowers' lightness, warmth, softness, and symbolism, making us aware of the value of goodness and nobility and honouring the grace of mother's love.

4.1.6. Work of Art

The art work 1: title; The flowers of goodness as shown in as shown in Figure 9.

Figure 9: Artwork 1: Title; The flowers of goodness

Dimension; 150x200cm., Technique; hand embroidery, artificial flower

4.2. Artwork 2

4.2.1 Theme and Concept

The flower of goodness.

4.2.2 Form

Four pieces of fabric are embroidered with yarn to praise mother's Chinese ancient poetry characters, ballads and flowers representing mother, such as day lilies and jasmine flowers, including flowers blooming and blooming state, small in size and large in number. The lotus flowers are embroidered with medium yellow wool, among which 3 lotus flowers from small to large are hidden in the words and flowers in 2 pieces of fabric; There are also 2 lotus flowers, hidden at the bottom of the other two pieces of fabric. At the bottom of the cloth hang uneven but regular artificial jasmine flower strings to create a feeling of rhythm.

4.2.3 Material and Technique

Embroider to on thin white fabric and hung a string of artificial jasmine flowers.

4.2.4. Installation and Presentation

Hanging from the ceiling, Installed in the center of all works and setting at back layer.

4.2.5. Results of Creativity

Two pieces hang on each side to form a complementary effect, echoing in color and elements, forming a harmonious whole that gives a sense of serenity and comfort. Ancient poems, ballads and flowers strike an emotional chord with the viewer. Secondly, the dislocation of the suspension allows the work to form an orderly space, guiding the audience to walk into the space and see the orange hemerocallis flower in the first work, creating a low-key and elegant beauty.

4.2.6. Work of Art

The art work 2 title: The flowersof goodness shown in Figure 10.

Figure 10: Artwork 2 (4 pieces, 2 pieces/site, right, left) Title: The flowers of goodness

Dimension; 150x200cm., Technique; hand embroidery, artificial flower

4.3. Artwork 3

4.3.1. Theme and Concept

The flower of goodness.

4.3.2. Form

On the white round mosquito net, Chinese characters are embroidered with white and yellow wool, the content is a message from a mother to her child, and the flowers representing the mother, different sizes; Hang a string of jasmine flowers from the top of the mosquito net, connected to small lotus flowers placed on the ground.

4.3.3. Material and Technique

Embroider to on thin white fabric and hung a string of artificial jasmine flowers.

4.3.4. Installation and Presentation

Hanging from the ceiling to the ground, Installed in front of all works.

4.3.5. Results of Creativity

From a visual point of view, the transparency of the mosquito net gives people a feeling of lightness and transparency, and the above text and flower embroidery increase the artistic and cultural charm of the mosquito net. Hanging strings of Jasmine flowers are connected with Lotus flowers on the ground, forming a symmetrical composition of vertical and horizontal, making the whole space

full of vitality and natural beauty. This design is not only creative, but also full of poetry, let people feel the charm of nature. Secondly, from a psychological and emotional point of view, Jasmine and Lotus are both symbolic plants. Combined with the mother's message to her child and the flowers on the mosquito net, it forms a profound artistic conception. People can feel a calm, peaceful atmosphere, as well as the yearning and pursuit of a better life. It triggers people to think about nature, life and culture, reminds people to cherish every moment of life.

4.3.6. Work of art

The art work 3 title; The flowers of goodness as shown in Figure 11.

Figure 11: Artwork 3: Title; The flowers of goodness

Dimension; 80 x 360cm., Technique: hand embroidery on mosquito net, artificial flower

4.4. Artwork 4

4.4.1. Theme and Concept

The flower of goodness.

4.4.2. Form

On the fabric, white and yellow wool was used to embroim Chinese characters, the content of which was an ancient Chinese poem praising the mother and a flower representing the mother, and it was used to make a 1.8m-diameter 3d shape of the lotus. The lotus structure gradually decreases, and there are four layers of petals from the outer layer to the inner layer, and the size of the petals gradually decreases. Each layer of petals is slightly smaller than the one above, creating a gradual effect. The outer nine petals appear in full shape and size, with the second layer slightly reduced and the third layer further reduced, obscured to reveal the delicate outline of the petals. The innermost 4 petals are the smallest and only the top is exposed.

4.4.3. Material and Technique

Embroider to on thin white fabric and hung a string of artificial jasmine flowers.

4.4.4. Installation and Presentation

Hanging from the ceiling, Installed in the center of all works and setting at back layer.

4.4.5. Results of Creativity

From a visual point of view, the layers of lotus sculpture are distinct, the embroidered Chinese characters and flowers gradually become smaller with the petals, and the Chinese characters and flowers are more prominent, leaving a deep impression. The embroidered text is a lot of ancient Chinese poems praising the mother, which not only conveys the gratitude to the mother, but also shows the respect and inheritance of traditional culture. And lotus fresh, elegant complement each other, formed a unique cultural atmosphere. The lotus is often associated with Guan Yin, symbolizing purity, compassion and wisdom. This symbolic meaning, combined with the theme of praising mother, makes the whole work more rich in cultural connotation and symbolic significance, and also conveys the Flower of Goodness.

4.4.6. Work of Art

The art work 4 title; The flowers of goodness as shown in Figure 12 and the art work of 1-4 Installation view are also shown in Figure 13 and 14.

Figure 12: Artwork 4: Title: The flowers of goodness, Dimension; 80 x 360 cm.,

Technique: white fabric covered over bamboo structure, hand embroidery

Figure 13: Artwork 1-4 Installation view

Figure 14: Artwork 1-4 Installation view

5. DISCUSSION

5.1. Artistic

The work shows artistic and cultural heritage through a combination of 2- and 3-dimensional flower forms. It is composed of a combination of three form elements. 1) Represented by daylilies, jasmine, lotus and other flowers, showing natural elegance and vitality 2) Quoting poems praising mothers in ancient Chinese literature, artistically integrating Chinese alphabets into the work, conveying the depth and goodness of maternal love 3) In terms of material selection, white linen fabric symbolizes purity and nurturing grace, while mosquito nets represent the mother's protection and care, guarding the growth of the child. The use of hand embroidery technology adds sophistication and warmth to the work. The works are installed in a suspended manner, allowing

the works to swing with the wind, conveying lightness and light emotions. In Chinese culture, hanging paintings is not only a form of expression of painting art, but also a symbol of culture. At the same time, the lotus flowers on the ground echo the suspended elements, expressing a beautiful state of internal and external beauty, highlighting the inner purity and elegance.

5.2. The New Finding the New Knowledge

This thesis introduced another branch of fine art, namely literary art. which comes from ancient literature that is an important part of Chinese culture. presented in the form of visual art with contemporary art methods using simple materials and creative processes, but there are two impacts on perception: 1) aesthetic value As art is a science of value. This thesis has created aesthetic value in terms of form. Various visual elements through materials, light, shadow, and meticulous installation. Passing on the perception of the purity, warmth, and nurturing of the love that a mother has for her child. 2) The value of humanity. This thesis presents the content and awareness of the value of motherhood which humans have always praised as the goodness.

5.3. The Impact on Social or Technical Field

Through the works, the understanding of maternal love and the expression of themes such as purity and nobility can touch people's emotions and resonate. At the same time, the works carry the connotation of cultural traditions and symbols, promote people's recognition and protection of traditional culture, and deepen their understanding of the symbolic meaning of culture. Using warm white tones and pure materials for creation, it creates a warm and comfortable atmosphere, which helps to promote mental health and relieve stress, anxiety and other negative emotions. The exploration of materials, themes, and ideas impacts the field of art education. It can stimulate students' creativity and aesthetic concepts and promote the diversified and innovative development of art education. The works have a positive impact on society and promote the development of cultural inheritance, emotional communication.

6. FUTURE RECOMMENDATION

This research is of great value to multiple groups and can help inspire creative inspiration and aesthetic concepts for artists. For educational institutions and educators, this research provides cases for exploring emotional, cultural and social meanings in art education and promotes the diversity and innovation of teaching content. In social psychology, we explore the role of emotions in social relationships and cultural inheritance, as well as the relationship between emotional expression and social interaction. Artistic creation can be necessary for emotional expression and psychological recovery, helping individuals relieve emotional distress and stress. In terms of cultural studies, explore the changes and meanings of emotional symbols and cultural symbols in different cultural backgrounds, as well as the impact of emotions on cultural identity and inheritance.

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Government and Public Reactions to Short Video Rumors: A Case Study of Thurman Cat and a Cup Incident

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ABSTRACT

This study explores the complex relationship between government responses and public attitudes toward rumors spread through short videos, using the viral case of internet celebrity "Thurman Cat and a Cup" as an example. Focusing on a fabricated story about a child's lost homework, the research examines how these interactions influence regulatory measures and shape public opinion, particularly in public relations, advertising, and media. Through a qualitative case study approach, data were gathered from social media analytics, expert interviews, and public opinion surveys to provide a comprehensive understanding of both government actions and public reactions. The findings reveal that while government efforts to curb misinformation in short videos are largely driven by public demand for authenticity and accountability, public opinion is divided. Some view these interventions as necessary for maintaining social order, while others see them as an overreach that could stifle freedom of expression. Ultimately, this study highlights the delicate balance between regulation and freedom in the digital age, emphasizing the crucial role of public relations and media strategies in shaping both public discourse and government policy.

Keywords: Public Relations, Advertising, Media, Short Videos, Rumor Management, Government Regulation, Public Attitude

Eco-Development Model for Regional Tourism Development: The Case of Silifke, Turkey

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ABSTRACT

The purpose of this research is to reveal the processes of determining the regional tourism development dynamics and putting them into practice by using the eco-development model to ensure regional tourism development by taking into account the ecological processes and concerns. This research was carried out with a phenomenological qualitative research method, and the research pattern was enriched by being transformed into a mixed method with qualitative research. Accordingly, 13 experts were interviewed with semi-structured questions in the qualitative part of the study and content analysis was made using the licensed MAXQDA Analytics Pro version. This study is a qualitative research and the result of the research is believed to support the tourism stakeholders, consisting of the operators, local people, small and middle scaled enterprises in Silifke, managers and employees of the touristic facilities operating in Silifke. As a result of this thesis research, the "eco-development model" was terminologically brought to the literature. The eco-tourism or alternative tourism potential of Silifke has been revealed, the interest of the local people in tourism has been determined, and it has been concluded that the unique dynamics of Silifke can be activated through the orchestration and leadership of local governments with the participation and direction of all stakeholders. As a result of the research, it was understood that local governments played a key role in the success of a development model to be implemented for regional tourism development.

Keywords: Eco-Development Model, Ecological Process, Regional Tourism Development, Orchestration, Eco-Tourism Potential, Alternative Tourism