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Humanized management, fairness perception and health of merchant ecosystem: Driving mechanisms of the digital age

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HUMANIZED MANAGEMENT, FAIRNESS PERCEPTION AND HEALTH OF MERCHANT ECOSYSTEM: DRIVING MECHANISMS OF THE DIGITAL AGE

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I hereby declare that this DBA dissertation is my original work and it has been written by me in its entirety. I have duly acknowledged all the sources of information which have been used in this DBA dissertation.

This DBA dissertation has also not been submitted for any degree in any university previously.

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Zhuang Zeyong

Abstract

In the era of digital transformation, the competition among individual enterprises has evolved into competition of business ecosystems, and the merchants in shopping malls have evolved from atomistic competition to ecological competition. Therefore, merchants must ensure the health of business ecosystems to establish competitive advantages. This study uses the survey data of merchants in five shopping malls in Guangzhou to empirically test the mechanism of the effect of humanized management on the health of business ecosystems in the context of digital transformation.

The empirical results show that: 1. Humanized management of shopping malls helps to build trust and loyalty, promote cooperation between merchants, and thus enhance the health of business ecosystems. 2. Humanized management of shopping malls means that merchants are treated fairly, thus enhancing their sense of fairness. 3. The sense of fairness of merchants plays a mediating role between humanized management and profitability, system connectivity, and relationship predictability, indicating that humanized management creates a good environment for merchants' development after enhancing fairness perception, and also helps to increase the predictability of partners' behavior, thus enhancing the health of business ecosystems. 4. Compared with the merchants in the low digitalization group, the humanized management

cognition of merchants in the high digitalization group has a greater effect on enhancing fairness perception, and digitalization positively moderates the indirect relationship between humanized management and profitability, system connectivity, and relationship predictability through fairness perception. The empirical results also show that although the mediating effects of profitability, system connectivity, and relationship predictability and moderating mediating effects are significant, the diversity of partners is not significant, indicating that fairness perception cannot enhance the diversity of partners of merchants.

This study discussed the driver mechanism of business ecosystem health from a micro perspective, and expanded the theory of business ecosystem system. From the perspective of practice, the conclusions of this study are also of great significance for the business practice of shopping malls: first, shopping malls should consider the merchants, monitor their sense of fairness, respect the merchants, and create a atmosphere of mutual trust to enhance their loyalty; second, for merchants, they should increase their investment in digitalization, actively embrace digital transformation, such as interacting with customers online, and publicizing and selling goods; for shopping malls, they can try to establish digital platforms to create an integrated shopping ecosystem beyond serving merchants and customers, in order to enhance competitiveness in the digital era.

Keywords: humanized management, fairness perception, business ecology healthy, digitalization, shopping mall

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Chapter I

Introduction

1.1 Background

As economic behavior shifts from individual to interconnected network-based economics, the study of business strategy has also evolved to encompass multiple dimensions for understanding the sustained interactions and behaviors among organizations (Martinelli, 1994). Atomsitic competition is no longer enough to describe the competitive-cooperative relationships within the networks of social, specialized, and inter-organizational networks (Baker, 2002; Galaskiewicz & Zaheer, 1999; M. Granovetter, 1985; Gulati, 1998). Thus, the concept of "business ecosystems" was introduced to describe economic unions based on the interactions among organizations and individuals (Moore, 1993, 1998). In practice, business ecosystems are composed of customers, suppliers, other partners, and stakeholders providing complementary products or services (Joo & Shin, 2018), and are characterized by self-organization, emergence, co-evolution, and adaptation (Song et al., 2018). With the acceleration of economic globalization and integration, the development of "business ecosystems" is very rapid, and many core companies have begun to actively abandon the previous "atom-centric" thinking, actively help other companies in the "business ecosystem" to improve the stability and competitiveness of the ecosystem, and traditional business competition has evolved from competition between individual companies to competition among business ecosystems (Iansiti & Levien, 2004; Kapoor & Agarwal, 2017; Song et al., 2018).

Shopping malls provide merchants with both competitive and cooperative opportunities for operations and marketing (Teller et al., 2016). The importance

of shopping malls lies in the provision of varied touchpoints (Lemon & Verhoef, 2016), constituted by the many different retail stores, brands, and services that are gathered in one location. Consequently, shopping malls can be seen as a business ecosystem (Picot-Coupey et al., 2021; C. Yiu & Xu, 2012; C.-Y. Yiu & Yau, 2006), that not only represent consumption spaces (Bloch et al., 1994), but also help consumers experience different stores, entertainment, and other services. Especially in shopping malls that are more specialized, such as home furnishings malls, merchants of different categories gathered in the mall form a business ecosystem of competition and cooperation: (1) as a service platform, the shopping mall property managers provide merchants with property management and brand marketing services; (2) in order to increase the attraction of customers, merchants of the same category can cooperate on marketing activities to form a win-win situation; (3) from the perspective of the decoration process, customers purchase hardware-related goods such as water and electricity, tiles, ceiling, sanitary ware, kitchenware, cabinets, etc., as well as soft-installed goods such as furniture, paintings, lighting, carpets and decorations. Merchants who operate a certain category of goods (such as tiles) can refer customers to merchants who operate other complementary categories of goods (such as ceiling) to achieve win-win cooperation; (4) as a nodal subject, some interior designers can integrate merchants of various categories to break through the whole decoration chain. In other types of shopping malls, we can also observe similar ecosystems. For example, some comprehensive shopping malls provide consumers with diversified services such as clothing, dining, and entertainment. Merchants of various categories often jointly hold promotional activities and introduce customers to each other, and service-oriented

enterprises or merchants can also realize the overall benign development of the shopping mall by integrating the merchants in the shopping mall, thus forming a benign commercial ecosystem in the shopping mall. In this business ecosystem, the ecological "health" of the participating members is an important prerequisite for the sustainable development of the business ecosystem (den Hartigh et al., 2006; Song et al., 2018). Therefore, the development of a shopping mall depends on the ecological health of the merchants in the shopping mall.

Attention must be paid to the rapid development of online shopping, especially the proliferation of new generation digital technologies such as mobile internet, AI, and big data, which have a crowding out effect on offline consumption. Data show that in 2020, e-commerce sales in the US rose sharply, while physical retail sales fell by about 14% (Lipsman & Liu, 2020). The harsh situation has forced offline retailers to start taking online retail seriously (Palmié et al., 2022). In order to stay competitive, physical retailers have developed web-based stores and mobile applications, increased the number of digital customer touchpoints, and started merging the offline and online worlds (Jocevski, 2020), including renowned retailers such as J.C. Penney and Sears (Hokkanen et al., 2020). This means that in the digital age, retailers must adapt to the impact of new technologies and carefully review their business ecosystems (Grewal et al., 2021). The key question is how the ecosystem health of merchants in shopping malls is determined in the digital age.

Research has suggested that the sustainability of a shopping mall ecosystem is dependent upon the collaborative behavior among merchants (C. Yiu & Xu, 2012), implying that the ecological health of the merchants is a

function of their collaborative behavior. In shopping malls, collaboration between merchants and mall operators is the most typical type of collaboration. Humanization has been recognized as a philosophical concept to promote cooperation and collaboration since the Renaissance period (Arnaud & Wasieleski, 2014). Classical philosophers such as Kant also placed humanization-based moral autonomy in a prominent position (Kant, 1876). In Eastern philosophy, humanized thoughts of Confucianism (Kim, 2022) and Taoism (Zhao, 2022) have been considered to have played an important role in the development of business cooperation in East Asia. Existing research has also suggested that humanizing management is beneficial for the elevation of trust and reciprocity (Melé, 2003; M. A. Pirson, 2022) as well as loyalty (Baard et al., 2004; Deci et al., 2001; Pajak & Glickman, 1989). Therefore, for shopping malls, creating an environment of humanized management could aid merchants in supporting and cooperating with each other, ultimately enhancing the ecological health of the merchants.

Humanized management helps promote an inclusive society and foster goodwill, sincerity, and fairness (Goldman Schuyler et al., 2021). Fairness theory holds that fairness perception has a significant impact on individuals' emotions and behaviors (Holbrook Jr & Kulik, 2001; Lind & Tyler, 1988). The higher the fairness perception of the parties involved, the greater the motivation for cooperative behavior (De Cremer & Van Knippenberg, 2002; Tabibnia & Lieberman, 2007). Therefore, for shopping malls, creating a fair environment and enhancing merchants' fairness perception has its commercial value - in the face of intense competition, enhancing merchants' fairness perception can help merchants achieve cooperative behavior, such as cooperation with shopping

mall management, referrals between merchants, thus creating a healthy ecological position for merchants, promoting agglomeration effect, and ultimately helping the shopping mall achieve prosperous development. Even in the digital age, although many transactions have extended to online, physical interaction remains the primary means of enhancing business ecosystem competitiveness (Palmié et al., 2022; Wang & Coe, 2021).

The aforementioned analysis indicates that, in the age of ecological competition, merchants in shopping malls need to establish a healthy commercial ecology. From the perspective of shopping malls, practicing humane management is conducive to enhancing the sense of fairness among merchants and further improving the level of healthiness of commercial ecology. Based on the commercial practices of the digital transformation era and the merchant survey questionnaire data of shopping malls, this study deeply investigates the mechanism of humane management affecting the healthiness of merchant commercial ecology, in order to understand the theoretical logic of constructing a healthy commercial ecology.

1.2 Significance

1. This study expands the theory of business ecosystems. Existing assessments of business ecosystem health are based on macro-level perspectives and are evaluations of the system's overall performance, rather than the immediate perceptions of system participants (den Hartigh et al., 2006; Song et al., 2018). This study, based on the perspective of shopping mall ecosystems, discusses the mechanisms of how humanized management affects the health of merchants from a micro-level, which helps us further understand the inner logic of the formation and sustainable development of business ecosystems.

2. It further deepens our understanding of humanized management in business practice. Existing literature has already pointed out that in business practice, humanized management plays an important role in enhancing trust levels (Melé, 2003; M. A. Pirson, 2022) and loyalty (Baard et al., 2004; Deci et al., 2001; Pajak & Glickman, 1989). However, these are mainly qualitative studies or only philosophically expounded. This study collects large sample data to empirically test the mechanisms of how humanized management affects the health of business ecosystems, which is an important supplement to the existing research.

3. This research expands the application context of fairness perception-related theories. Previous research has conducted effective research on the related theories and applications of fairness perception, enabling us to gain a deeper understanding of the influencing factors and consequences of fairness perception (Ambrose & Schminke, 2009; Barsky et al., 2011; Berry et al., 2007; Cohen-Charash & Spector, 2001; Colquitt et al., 2001, 2013, 2018; Rupp et al., 2014). However, these studies mainly focused on the fairness perception issues within the organization, while recognizing that fairness perception exists between organizations, the studies mainly focused on distribution channels (Griffith et al., 2006; N. Kumar et al., 1995; Samaha et al., 2011) and strategic alliances (Luo, 2005, 2007, 2008a), with insufficient attention paid to the structure of shopping malls, which lies between organizations and markets. Thus, this research applies fairness perception-related theories to explain cooperation and ecological health issues of merchants in shopping malls, thus expanding the application context of fairness perception theories.

4. Developing a theory of collaboration between commercial real estate

and merchants. Scholars have noted that commercial real estate projects are the result of joint ventures between real estate developers and merchants, and the continuous operation and development of the project requires cooperation between both sides based on the contractual relationship, thus there is a high level of collaboration between real estate developers and merchants around commercial real estate projects (Chen et al., 2012; Guo, 2010a, 2010b). However, these studies mainly conduct some qualitative research and do not delve into the micro mechanisms. Therefore, the findings of this research will help to make up for the above-mentioned shortcomings.

5. Enriched the strategies of running a shopping mall. The shopping mall industry has grown rapidly over the past two decades, but with the influx of capital, technological advances, and social changes, competition has intensified. COVID-19 pandemic in 2020 has greatly affected furniture industry. According to the Statistical Communiqué of National Economic and Social Development of the People's Republic of China in 2020, furniture retail sales declined by 7%. Shopping malls are also faced with the challenge of improving synergy with merchants and strengthening competitiveness through humanized management. This research investigates the fairness perception of merchants and the health of the ecology from the perspective of humanized management, which helps shopping malls to develop diversified strategies to cope with the challenges brought by the external environment.

Chapter II

Literature Review

2.1 The relationship between a shopping mall and its merchants

2.1.1 A contractual relationship between the shopping mall and the merchants

Transaction cost economics considers the mode of operation to be essentially a choice problem of contracts- different contractual sets between firms, markets and other organisational forms- with the aim of minimizing transaction costs (Williamson, 2002). As previously articulated, a special contract form emerges between the shopping centre and merchants, which falls between the Coase notion of firms and markets (Coase, 1995).

Coase pioneered the modern theory of the firm, in which if the pricing mechanism were perfectly efficient, then it should be full social division of labour and market price adjustment, with no firms or internal division of labour. By relaxing the neoclassical assumption of perfect information, Coase argued that in real life, obtaining information by producer or consumer was not costless. This cost was the friction of the market mechanism-transaction costs. Firms substituted for the market pricing mechanism through the authority of the entrepreneur or management, so as to lower transaction costs. Hence, firms exist as substitutes to the market mechanism for resource allocation. The substitute role of firms to the market pricing mechanism is mainly manifested in two ways: firstly, in the market, transactions between specialized producers require contracts, and the signing of contracts involves transaction costs. However, in the firm, the connection between specialized producers does not require contracts for buying or

producing, and their production can be coordinated by authority mechanisms. Secondly, the labour contracts within the firm are generally long-term contracts, thus reducing the cost problem caused by the short-term market fluctuations.

Coase divided contracts into two types, namely, business and market (Coase, 1995). However, in practice, the contracts are more diverse, such as relational contracts. Williamson argued that under the assumptions of “bounded rationality” and “opportunism”, the main distinguishing features of various transactions are asset specificity, uncertainty, and frequency of transactions (Williamson, 1985). In order to economize transaction costs, different transaction characteristics need to be matched with different contracts. If there is a high level of asset specificity and high frequency of transactions, the two parties to the transaction will adopt relational contracts to govern and form a “bilateral governance” framework. In practice, merchants who join furniture shopping malls need to invest a lot of money in decoration, forming a higher level of asset specificity, and generally form a very close and long-term cooperation relationship with shopping malls, and the two are essentially a relational contract.

2.1.2 Cooperating between shopping mall and merchants

The concept of synergy was first proposed by German physicist Haken in 1971 and further systematized in 1976, and the important work "Introduction to Synergy Studies" was published, which broadly discussed the synergistic phenomena and laws existing in the system from the perspective of natural science. It is proposed that first, anything and phenomenon are composed of multiple elements, and the occurrence of things between things and certain phenomena are derived from synergistic actions, not

the process of a single element acting, and the cooperative coordination between elements in the system can better achieve the goal, and these results are often difficult to achieve by a single element. Second, it is precisely because of this feature that the synergy within the system enables the system to achieve greater goals and make better use of its own resources and capabilities. Third, it is believed that the occurrence of synergy is derived from the openness of the system, and it is because of the openness that the system can exchange information, energy and other resources from the outside, thus achieving the transition from imbalance to balance in the dynamic process (X. Yang & Ng, 2015).

Ansoff introduced the concept of natural science into social science (Ansoff, 1965). In his research on corporate strategy, he enriched the connotation of synergistic strategy: On the one hand, the synergy between internal resources and capabilities and external opportunities and environment is that managers are seeking to allocate production factors to meet the characteristics of external environment and opportunities, better use their own resources and better expand future development direction. On the other hand, synergy between diversified businesses in the company should be formed, that is, synergistic strategy is a coordination mechanism that can link the diversified businesses of the company, realize scale economy and scope economy to increase returns. Subsequently, synergistic effects were further used to discuss inter-organizational relationships. Organizations generally exist in a network, alternating between competition and cooperation, in which the sharing of knowledge is an important condition for obtaining synergistic effects, so benign knowledge sharing and cooperation between organizations can create synergistic effects far greater than the

simple sum of individual parts (Tsai, 2002).

Essentially, the relationship between shopping malls and merchants is that of a real estate developer and on-site merchants. In traditional commercial real estate development models, shopping malls and merchants are independent of each other and pursue their own interests for maximum benefit. Due to conflicting demands, conflicts between shopping malls and merchants are inevitable, leading to increased transaction costs (Guo, 2010a). As a result, in practice, shopping malls act like a central management unit, aggregating and managing merchants (Teller & Elms, 2010). These management activities include measures or services provided by centralized aggregation management, such as consistent opening hours (Baker, 2002), cleanliness and security services (Bloch et al., 1994; Severin et al., 2001), public restrooms (Baker, 2002), customer leisure areas (Baker, 2002), central information counters (Reimers & Clulow, 2004), mall location system signage (Teller & Reutterer, 2008), maintenance and improvement of the building structure (Hackett & Foxall, 1994), consistency of store appearance (Howard, 1997), arrangement of stores within the aggregation area (Wakefield & Baker, 1998), and aggregation area branding (Dennis et al., 2005).

From the perspective of merchants, they seek benefits and synergies in malls, the driving factors of which include geographic location, accessibility and parking conditions (Teller & Schnedlitz, 2012). The strategic cooperation and consistency of long-term objectives between shopping malls and merchants effectively reduce the frequency of conflicts in the development and operation process; the system's clear division of labor and close cooperation make the roles of each member clear; the efficient and timely information sharing mechanism also effectively reduces the

possibility of conflicts. The collaborative network between shopping malls and merchants can improve their communication, resource sharing, risk sharing, achieve common expectations and goals, and ultimately achieve a "win-win" outcome (Guo, 2010a). In practice, a large number of small and medium-sized merchants in many shopping malls keep changing like a “rotating lantern”, while the larger merchants remain “as solid as a mountain”, which is due to the fact that those small and medium-sized merchants who cannot better adapt to the collaborative network can only withdraw from the shopping malls. This means that small and medium-sized merchants must take the initiative to integrate themselves into the existing collaborative network, and actively integrate themselves into the interaction with merchants and other large merchants by choosing the format under the limited spatial location, so as to actively embed themselves in the collaborative network and obtain coupling of benefits allocation (Guo, 2010b).

From the perspective of shopping malls, besides centralized management, high-level synergy is also very important. Studies have shown that consumer loyalty to merchants will affect loyalty to shopping malls, so shopping malls should not only limit their marketing efforts to the shopping malls themselves, but also provide enough support to the merchants in the shopping malls so that they can increase consumer loyalty to the merchants, which ultimately promotes loyalty to the shopping malls (Rabbanee et al., 2012).

2.2 Research on business ecosystems

2.2.1 The connotation of the commercial ecosystem

The concept of business ecosystems originated from ecology to understand how economic communities function, and has been described as an economic alliance based on the interactions between organizations and individuals (Moore, 1993, 1998). Nevertheless, compared to other economic and management theories, business ecosystems are still a relatively new research field. Due to different research perspectives and objectives, different researchers have different conceptualizations of business ecosystems.

Moore was the first scholar who proposed the concept of business ecosystems. Moore attempted to use the ecosystem in biology to explain the strategy changes in business networks, and argued that business ecosystems can be used to analyze microeconomic entities undergoing centralized co-evolution (Moore, 1993). In many industries, in order to meet consumer demand, businesses in the industry produce innovative products through co-evolution and achieve innovative sustainability through resource integration. Furthermore, Moore further used the ecosystem to describe how a company can fail or succeed in a business ecosystem, emphasizing that the competitive advantages of businesses in business ecosystems come from bargaining power, continuous innovation, and embeddedness in business ecosystems, thus innovation requires companies to co-evolve with other partners through cooperation, alliances, or standardization (Moore, 1998).

From a network perspective, a business ecosystem is composed of a network of

business actors that are interlinked (Iansiti & Levien, 2004). Because the concept of a business ecosystem has its roots in ecology, many of the features of natural ecosystems, such as structure, relationships among members, types of relationships, and roles of members, are strikingly similar to that of business networks. Thus, comparing business ecosystems to natural ecosystems is helpful in conceptualizing it. Thus, a business ecosystem can be thought of as the interconnections among economic entities, i.e. the characteristic of mutual dependency among them for survival and development (Den Hartigh & Van Asseldonk, 2004; Peltoniemi et al., 2005). In the networked structures between firms, a large number of diverse organizations cooperate in producing products for consumers, connecting their fates (Iansiti & Levien, 2004). Beyond the network structure, it is necessary to conceptualize a business ecosystem as a new theoretical framework to describe the health and composition of the industry.

Researchers have also discussed the business ecosystem from a dynamic perspective. Peltoniemi argued that the business ecosystem is very suitable for analyzing business systems with interconnecting features (Peltoniemi, 2004). Peltoniemi and Vuori further suggested that a business ecosystem is composed of a large set of small firms, large firms, universities, research centers, public service organizations, and other organizations that can affect the system, forming a complex and dynamic structure (Peltoniemi & Vuori, 2004). Peltoniemi et al. defined the business ecosystem as a system in which participants are interconnected and influence each other, resulting in a diverse set of interactions among the derivative participants -- both competition and cooperation (Peltoniemi et al., 2005). The business ecosystem makes it so that each participant is linked in fate and relies on one another. The failure

of one participant can lead to a chain reaction, causing other firms to fail by association. The business ecosystem helps participants acquire adaptability through self-organization and collaborative evolution. The business ecosystem is integrated into the operating environment of the participants and evolves and develops over time.

Furthermore, Den Hartigh and Van Asseldonk argued that business ecosystems consist of networks of suppliers and consumers which are dependent on each other for survival and success, revolving around a core technology (Den Hartigh & Van Asseldonk, 2004). Vuori focused on knowledge-intensive organizations and claimed that business ecosystems are interrelated organizational groups (Vuori, 2005). Quaadgras also asserted that business ecosystems are complex combinations of products and services involving multiple organizations (Quaadgras, 2005).

2.2.2 The health of the commercial ecosystem

Similar to natural ecosystems, the essential precondition for the sustainable development of business ecosystems is the 'health' of the entire system and the participants within it. 'Health' is a term in biology which describes the state of a system or a particular species and, thus, just like natural ecosystems, the health of a business ecosystem also indicates its potential and longevity for future development (den Hartigh et al., 2006). Iansiti and Levien defined the health of business ecosystems from the perspective of the entire business system, and took the 'health' of business ecosystems as an important indicator for assessing the overall performance of the system (Iansiti & Levien, 2002, 2004). They argued that the health of business ecosystems is determined by the system's robustness, productivity, and niche creativity.

Robustness reflects the system's survival flexibility to environmental uncertainties, productivity reflects the efficiency of the system in transforming inputs into value-added outputs, and niche creativity reflects the diversity of roles in the ecosystem and the creativity that follows. Iansiti and Levien evaluated the health of business ecosystems from the 'meso' level (Iansiti & Levien, 2002), it is the assessment of the overall performance of the system made by an 'outsider' (den Hartigh et al., 2006), rather than the intimate feelings of the system's participants. For the members of the system, their own perception of the system's health may be more important, after all, this perception and evaluation will have a decisive significance for the subsequent strategic decision-making and strategic behavior. Iansiti and Levien further proposed the criteria for measuring the health of business ecosystems in their article, but their research was still descriptive (Iansiti & Levien, 2004). Den Hartigh et al. made a distinction between the health assessment of the system level and the health assessment of the enterprise level (den Hartigh et al., 2006). They argued that from the perspective of the enterprise, the health of business ecosystems needs to consider the health of the members and the health of the network system. The health of the members can be evaluated by indicators such as the member's solvency and liquidity, which reflects the long-term financial situation of the system; the health of the network system can be reflected by the members' evaluation of their own connection with the system, the diversity of partners they possess in the system, and the predictability of their relationship, which together reflect the interdependence of the network.

2.3 Research on Humanistic Management

2.3.1 The Connotation and Principles of Humanistic Management

Humanistic management is a management approach that emphasizes the recognition of employees as individuals with emotions, desires, and unique needs. It is a people-centered management philosophy that acknowledges the well-being and motivation of employees as pivotal to the success of an organization (Deci & Ryan, 2000). Research posits that humanistic management is applicable across multiple sectors, including commerce, education, government, and healthcare (M. A. Pirson, 2022). Humanistic management entails: (1) upholding the dignity, rights, uniqueness, social competence, and personal growth potential of individuals; (2) respecting individuals and their human rights; (3) caring for and serving those around us; and (4) managing for the common good rather than special interests. Under humanistic management, members within an organization are willing to cooperate and even sacrifice individual interests, resulting in trust (Melé, 2003). Existing research on humanistic management primarily focuses on internal organizational management, specifically the humanistic management of employees.

Humanistic management is based on several principles aimed at creating a positive work environment that enhances employee satisfaction, motivation, and productivity. These principles include:

1. Respect: Humanistic management recognizes that employees are valuable assets to an organization and should be treated with respect and dignity (Harter et al., 2002). This entails providing fair compensation, benefits, and opportunities for growth

and development.

2. Empathy: Humanistic management requires managers to understand and empathize with the needs, feelings, and concerns of employees (Kahn, 1990). This means listening to their feedback, recognizing their contributions, and addressing their issues in a timely and effective manner.

3. Flexibility: Humanistic management promotes flexibility in work arrangements, such as flexible work hours, telecommuting, and job sharing (Keller, 2006). This allows employees to balance work and personal responsibilities, which may lead to increased job satisfaction and retention.

4. Collaboration: Humanistic management encourages cooperation and teamwork among employees (Braun et al., 2013). This means creating a work culture that values collaboration, communication, and mutual support.

5. Work-Life Balance: Humanistic management recognizes the importance of work-life balance and promotes policies that support employees in achieving this balance (Spreitzer et al., 2005). This means providing flexible schedules, paid vacation, and other benefits that support a healthy work-life balance.

2.3.2 The Role of Humanized Management

Humanized management is known to foster trust, loyalty, and respect among stakeholders, resulting in better social performance (Arnaud & Wasieleski, 2014). Research indicates that organizations that implement humanized management practices are more likely to attract and retain talented and motivated employees (Spreitzer et al., 2005). This is because employees are more likely to feel satisfied with their work and

appreciate the value and support provided by their employer. Humanized management also positively influences employee productivity and performance. Studies have shown that employees who perceive employer support and appreciation are more likely to be engaged in their work, leading to enhanced productivity and performance (Harter et al., 2002). Moreover, humanized management can contribute to creating a positive organizational culture by promoting a supportive, collaborative, and respectful work environment that attracts and retains talented employees (Spreitzer et al., 2005).

Despite its many benefits, humanized management encounters challenges and limitations. One of the most significant obstacles is the potential conflict between the needs of the organization and the individual needs of employees. For instance, providing flexible work arrangements may be beneficial for employees, but it may also make it more challenging for managers to coordinate work and achieve organizational objectives (Ibarra, 2015).

As a management philosophy, humanized management acknowledges that the prosperity of an organization largely depends on the well-being and motivation of its employees (Deci et al., 2001). Although implementing humanized management practices poses challenges and limitations, research shows that organizations that adopt this approach are more likely to attract and retain talented employees, enhance productivity and performance, and create a positive organizational culture (Braun et al., 2013; Spreitzer et al., 2005). Therefore, humanized management is a management approach that merits serious consideration and is crucial for organizations committed to creating supportive and positive work environments for their employees. Nonetheless, the success of humanized management hinges on the commitment and

recognition of organizational leaders and managers. If leaders and managers do not commit to adopting humanized management principles, these principles are likely to be ineffective and not sustainably developed (Spreitzer et al., 2005).

2.4 Studies on fairness perception

2.4.1 The concept of fairness perception and its dimensions

Research into fairness started in the 1960s with the work of Adams on fairness theory. These studies focused on individual perceptions and mainly dealt with distributive fairness (Adams, 1963, 1965). Fairness was defined as a justice issue concerning reward and resource allocation, in which the ratio between a person's contribution and the outcome he or she receives is an equal balance (Adams, 1965; Austin & Walster, 1974; Hatfield et al., 1978). That is, fairness is generated when one perceives his or her input-outcome ratio to be equal to that of others. Adams argued that people do not care about absolute fairness of outcomes, but rather fairness of outcomes relative to each other (Adams, 1965). Leventhal suggested that people would proactively create fair reward distributions to make the rewards that they receive proportional to their contributions (Leventhal, 1976). Lind and Tyler found that outcomes of allocations are not always as important as the process of allocation (Lind & Tyler, 1988). Therefore, in order to explain and predict people's reactions to perceived unfairness, the focus of research shifted to procedural fairness (Cropanzano & Randall, 1993), which refers to fairness perception of the process leading to outcomes. At the same time, Bies proposed the concept of interactional fairness, which emphasizes interpersonal aspects in organizational practices, that is, the

communication and exchange between the management and employees (Bies, 1986). Greenberg argued that interactional fairness is composed of interpersonal fairness and informational fairness (Greenberg & Cropanzano, 1993).

Regarding the dimensions of fairness perception, Cohen-Charash and Spector viewed it as comprising three dimensions of distributive justice, procedural justice, and interactional justice (Cohen-Charash & Spector, 2001), while Colquitt et al. separated interpersonal justice and informational justice (Colquitt et al., 2013), viewing fairness perception as four dimensions (Rupp et al., 2017). Given existing research findings that these four dimensions of justice are highly relevant to higher-level organizational justice (Colquitt & Shaw, 2013; Liao, 2007), Colquitt found that the four-factor model was the most suitable and that these four dimensions of justice predicted different outcomes respectively (Colquitt et al., 2001). Thus, in this paper, fairness perception is divided into distributive justice, procedural justice, and interactional justice, and interactional justice is further decomposed into informational justice and interpersonal justice.

2.4.1.1 Distributive fairness

Fairness perception of resource distribution is referred to as distributive justice, which focuses on the fairness of perceived outcomes (Huo et al., 2016). Due to the emphasis on outcomes, distributive justice is considered to be able to influence one's cognitive, affective and behavioral responses to a particular outcome. Hence, when perceiving an unfairness, it can affect one's emotion to be angry, happy, proud or guilty (Weiss et al., 1999), distort one's or others' perception of ideas and outcomes (Adams,

1965; Austin & Walster, 1974; Hatfield et al., 1978), leading to eventual influence on their behavior.

2.4.1.2 Procedural fairness

Procedural fairness refers to the fairness of the means or processes used to make allocation decisions (Huo et al., 2016; M. Kumar & Kumar, 2016; Lind & Tyler, 1988). When a procedure follows the six rules of consistency, bias inhibition, accuracy, correctability, representativeness and ethics, it is considered to be a fairer procedure (Leventhal, 1976). Thus, when a process leading to a certain outcome is deemed to be unfair, the reaction is considered to be towards the organization as a whole, rather than towards the particular outcome. This is in contrast to distributive fairness, which emphasizes the reaction to outcomes, whereas procedural fairness emphasizes the reaction to the organization (Cropanzano & Folger, 1991; Sweeney & McFarlin, 1993).

2.4.1.3Interactional fairness

Interactive fairness is an extension of procedural justice and is related to the perspective of people in organizational practices (Bies, 1986), that is, it is related to the way managers - those who reward and control resources - behave towards fairness recipients. Therefore, interactive fairness is related to the communication process between managers and recipients (Bies, 1986), and as interactive fairness is determined by the interpersonal behavior of the representatives, the cognitions, emotions and behavioral responses of these representatives can affect interactive fairness (Bies, 1986; Cropanzano et al., 2002; Masterson et al., 2000).

Interactive fairness is considered to be composed of two particular interpersonal

relationships (Greenberg & Cropanzano, 1993). One is interpersonal fairness. Interpersonal fairness involves respecting others (Bies, 1986; Greenberg & Cropanzano, 1993), referring to the degree to which employees are treated courteously and respectfully (Bies, 1986). When the supervisor interacts with employees by showing courtesy, attentiveness and sincerity, the subordinates may feel that the supervisor's respect is an affirmation of their organizational status (Bies, 1986). At the same time, the supervisor's fair treatment of interpersonal relationships may also cause the subordinate's daily work attitude to exceed their emotional or emotional range (Loi et al., 2009). The other is informational fairness. Informational fairness focuses on the explanations provided to people, which convey information about why the procedure is used in a certain way or why the results are distributed in a certain way (Greenberg & Cropanzano, 1993). That is to say, information fairness deals with the adequacy of the explanations given about the implementation of organizational policies (Colquitt et al., 2001). When the supervisor clearly explains the procedures for determining employee performance, information fairness is demonstrated.

2.4.2 The influence of fairness perception

Many studies in the corporate practice have associated fairness perception and attitude with behavior, and empirical research has indicated that fair perception has impacted a range of behaviors that are beneficial to organizational performance, including job satisfaction, organizational commitment, task performance, organizational citizenship behavior, as well as counterproductive behavior (Ambrose & Schminke, 2009; Berry et al., 2007; Cohen-Charash & Spector, 2001; Colquitt et al.,

2001, 2013; Rupp et al., 2014).

2.4.2.1 Job satisfaction

Job satisfaction refers to an employee's level of contentment with their job and sense of accomplishment derived from it, stemming from one's evaluation of their work, which is seen to facilitate the realization of one's work values (Locke, 1969). Fairness perception in the organization makes people feel that they are reliable and valuable to the organization and team (Whitman et al., 2012), ultimately leading to increased job satisfaction (Bernerth et al., 2016). McFarlin and Sweeney indicated that distributive fairness was more predictive of job satisfaction than procedural fairness (McFarlin & Sweeney, 1992). Other studies have shown a high correlation between procedural fairness and job satisfaction (Mossholder et al., 1998; Wesolowski & Mossholder, 1997). Furthermore, Masterson demonstrated that both procedural and interactional fairness can significantly affect job satisfaction, with procedural fairness being more predictive of job satisfaction than interactional fairness (Masterson et al., 2000). Bernerth revealed a positive correlation between procedural and interactional fairness and job satisfaction through a survey of 1,297 employees from 162 work units and 162 supervisors (Bernerth et al., 2016).

2.4.2.2 Employee performance

Fairness perception is behaviorally critical to core job tasks and leads to improved employee performance (Colquitt et al., 2013; Rupp et al., 2017), and subsequent organizational efficiency (Rotundo & Sackett, 2002). The fairness theory provides specific hypotheses about the effect of distributive unfairness on performance (Adams,

1965; Austin & Walster, 1974), wherein employees can restore fairness by changing the quality or quantity of their work when perceiving unfairness. Based on the Social Exchange Theory, researchers have provided specific hypotheses about the relationship between procedural fairness, interactional fairness, and job performance (Cropanzano et al., 2002; Masterson et al., 2000). The Social Exchange Theory posits that organizations are places of long-term, reciprocal social exchanges between employees and organizations (Greenberg & Scott, 1996; Wayne et al., 1997). When supervisors treat employees fairly, employees will respond with better performance to their fairness perception; whereas employee dissatisfaction with their supervisors leads to poor performance. Studies demonstrate that interactional fairness contributes to improved job performance (Blader & Tyler, 2009; Brockner et al., 2009).

2.4.2.3 Organize civic behaviors

Organizational Citizenship Behavior (OCB) is beneficial to organizations and it is a behavior that contributes to society to influence organizational objectives (Organ & Moorman, 1993; Spitzmuller et al., 2008). Fairness perception is assumed to be the major predictor of OCB (Moorman et al., 1998) and employees' perception of interactional fairness usually brings positive outcomes such as OCB (Colquitt et al., 2001). Positive interactions between supervisors and employees demonstrate that subordinates are valuable organization members and make them feel accepted and supported by society (Masterson et al., 2000), and fairness perception helps to affirm employees' self-worth and identity in the organization (Cropanzano et al., 2001). Based on Social Exchange Theory, employees can return the perceived fair treatment by

exhibiting positive OCB (Blader & Tyler, 2009; Cropanzano et al., 2002). Rupp found that subordinates tend to support supervisors they perceive as fair (Rupp et al., 2017). Collins and Mossholder conducted a questionnaire survey of employees from a large manufacturing organization in the United States and the results showed that interactional fairness is positively correlated with OCB (Collins & Mossholder, 2017). If a project manager treats project participants politely and respectfully, the project performance can be improved (Lim & Loosemore, 2017).

2.4.2.4 Counterproductive work behavior

Counterproductive work behaviors refer to arbitrary actions that harm the organization and its members (Robinson & Bennett, 1995), which include active behaviors (e.g., theft) or passive behaviors (e.g., deliberately not following instructions) related to distributive, procedural, and interactional fairness, and perceived as reactions to unfairness (Greenberg & Scott, 1996). When employees perceive inequitable distributions, they may harm the organization in a way that results and inputs are less negative from their perspective. From the perspective of procedural fairness, perceived unfairness leads to a negative view of the organization, leading to counterproductive behavior in a fit of pique. To some extent, employees perceive their organization as unfair, as it uses unfair procedures to distribute resources, employees form negative attitudes towards the organization (e.g., lower trust and commitment, and higher anger), negative attitudes and emotions lead to a lack of motivation to work for the organization, which can lead to employees taking action against the organization (Daileyl & Kirk, 1992; Skarlicki & Folger, 1997). Siman Tov-Nachlieli and Bamberger conducted an

experiment on 394 employees using an online simulation and evaluated actual cheating behavior of employees and found that when pay distributions were transparent and participants' pay was lower than their colleagues, participants had lower perceived distributive fairness, which led to increased cheating behavior (SimanTov-Nachlieli & Bamberger, 2021).

2.4.3 Fairness perception between organizations

Previous literature on fairness perception has mainly focused on intra-organizational aspects. However, researchers have also noted the role of fairness issues in inter-organizational collaborations. Classical literature has emphasized the importance of fairness in inter-organizational relationships, claiming that fairness perception has a significant impact on the quality of inter-organizational relationships (N. Kumar et al., 1995). In terms of the concept of inter-organizational fairness perception, research has posited that inter-organizational fairness refers to an organization's perception of fairness regarding the treatment received from other organizations and their reactions to this perception (J. R. Brown et al., 2006; Homburg & Fürst, 2005). Subsequently, discussions about inter-organizational fairness perception have drawn researchers' attention to two domains, namely, distribution channel management and strategic alliances (Trada & Goyal, 2017).

2.4.3.1 Fairness perception in Distribution Channel Management

Given that partner relationships in distribution channels are a valuable asset of supplier firms and an unparalleled source of long-term competitive advantage (Homburg et al., 2014; Y.-C. Yang, 2012), marketing scholars have keenly realized the

issue of fairness perception between businesses and distributors, thus necessitating the resolution of fairness perception issues in distribution channels (Griffith et al., 2006; N. Kumar et al., 1995; Samaha et al., 2011). Discussions on fairness perception have become hotspots in some relationship marketing studies (J. R. Brown et al., 2006; Y. Liu et al., 2012; Samaha et al., 2011; Yilmaz et al., 2004). In distribution channels, distributors often judge their rewards based on their own efforts and evaluate the fairness/unfairness of the manufacturer (N. Kumar et al., 1995). This notion of fairness/unfairness has profound effects on the attitudes and behaviors of distributors (Trada & Goyal, 2017). For example, if the supplier is perceived as fair, it will strengthen its trust and commitment relationship with distributors (Kashyap & Sivadas, 2012) and further influence the behavior of distributors (Griffith et al., 2006). Conversely, unfair perception creates strong distrust (Kaufmann & Stern, 1988) and conflicts (J. R. Brown et al., 2006). Studies have demonstrated that perceived unfairness can directly destroy channel relationships, amplify the negative impacts of conflicts and opportunism, and further undermine the benefits of managing distribution channels, thus being the "poison of interorganizational relationships". Studies also indicate that due to the lever effect of conflicts and opportunism, managers should take the initiative to address the issue of unfairness before resolving conflicts and opportunism. For instance, managers can devise special educational and training programs to emphasize the importance of fairness, identify the types of situations most likely to evoke unfairness perception, and come up with "unfairness prevention" strategies (Samaha et al., 2011). Additionally, there is research pointing out that fairness concepts in existing business marketing literature are usually studied from the buyers'

perspective, whereas the supplier’s view of the fairness of the buyer is also worthy of further study (Zaefarian et al., 2016).

2.4.3.2 Fairness perception within strategic alliances

Reaction to perceptions of fairness/unfairness is more prevalent in those relationships that are oriented and long-term (Luo, 2008). Especially in strategic alliances, the levels of allocation fairness, procedural fairness and interactional fairness have a significant positive effect on alliance performance (Luo, 2007). More refined research indicates that procedural fairness is positively correlated with operational outcomes of the alliance and has an effect on alliance performance through trust (Luo, 2008). In particular, mutual perceptions of procedural fairness between the two sides of the strategic alliance are particularly important, and when both sides perceive procedural fairness to be high, the profitability of the alliance is strongest (Luo, 2005). In international investment, the fairness perceptions of the two sides of the international joint venture can influence their decision logic (including property rights logic, control logic, and relationship quality logic), which in turn affects the joint venture partners' evaluation of the efficiency and equity of the alliance and the decision to establish the joint venture (Ariño & Ring, 2010). In some specific cases, such as in construction projects, contractors' perceptions of procedural fairness can effectively reduce the intensity of conflicts and the potential for disputes (Aibinu et al., 2008), and can even explain 38% of the level of conflict intensity and 46% of the contractors' propensity to dispute (Aibinu et al., 2011). Research on Chinese PPP projects also suggests that procedural fairness can promote cooperation between partners (Z. Zhang & Jia, 2010).

2.5 Comments of the literature

The importance of business ecosystems has been acknowledged by researchers, yet there is scant discussion on the business ecosystem in professional shopping malls. Moreover, existing studies on humanized management and equity perception mainly focus on corporate internals, failing to realize that similar problems may arise from equity perception in other production organizations, such as the special "relationship contract" concluded between shopping malls and merchants that also involve important synergistic effects. Thus, the humanized management and equity perception of the shopping mall as the "central manager" has practical significance to merchants. This is the focus of this research.

Chapter 3: Theoretical Analysis and Hypothesis

3.1 The impact of humanized management on the health of merchant ecosystems

In China, brand manufacturers or agents rent shop fronts in shopping malls to attract customers so that the brand can penetrate the market terminal. A special trading contract is formed between the shopping mall and the merchants: (1) merchants need to invest a large amount of money to decorate and form a high level of special assets; (2) although the contract between the shopping mall and the merchants is usually signed once a year, considering the large amount of special investment, merchants generally establish a long-term cooperation relationship with the shopping mall. In this case, the contract between the shopping mall and the merchants is between the enterprise and the market in the sense of Coase (Coase, 1995). According to Williamson, if there is a high degree of asset specificity and high transaction frequency, the two parties to the transaction will adopt a relationship contract for governance (Williamson, 2002). A very close contractual relationship will be formed between the shopping mall and the merchants, forming a "bilateral governance" framework. Under the "bilateral governance" framework, the shopping mall legitimizes the institutionalized management through contracts, giving it the right to plan, coordinate, implement and control measures to increase the attractiveness of the shopping mall to consumers, thus increasing the possibility of crowding and merchant success (Teller & Elms, 2010). Therefore, the key to the success of the shopping mall lies in balancing the interests of different entities, encouraging cooperative behavior among them, giving full play to their respective advantages, and obtaining economic benefits brought by agglomeration

effects. From the perspective of merchants, if merchants and shopping malls, merchants and merchants have not shown good cooperative behavior in site selection, internal functional matching, business model, etc., there will be conflicts of interest between the parties, and eventually lead to the overall loss.

Within the framework of bilateral governance, the transactional behaviors between shopping malls and merchants share many similarities with those of vertically integrated enterprises. This is typically manifested in the strong position that the shopping malls hold in the cooperation, often playing the role of a resource allocator and manager as the “central administrator” (Teller & Elms, 2010). As the allocator, the shopping malls are endowed with the power to allocate merchant locations, which is highly critical to the merchants(Teller & Schnedlitz, 2012); they can also flexibly set the standard for rent collection in accordance with the locations. As the manager, the written contracts signed by the shopping malls and the merchants usually stipulate that “party B (merchants) shall not operate or cease to operate the brand series products specified in the contract without party A's (shopping mall) consent”, “any increase or change in the brand operated by party B without party A's consent shall be deemed as a serious breach of contract”, “all installation and use of facilities and equipment of party B shall be subject to the written consent of party A”, and even “party A shall have the right to enter party B's merchant at any time to check whether party B has violated the lease agreement or management regulations”. Under this management model, a relationship similar to that between an enterprise and its employees exists between the operators of the shopping malls and the merchants, thus bringing in the issue of humanized management.

Humanized management is applicable to multiple domains such as business, education, government, or healthcare (M. A. Pirson, 2022). Humanization of management implies (1) recognition of individual's dignity, rights, uniqueness, social skills, and capability for personal growth; (2) respect for individuals and their rights; (3) caring and service of people around; and (4) managing for collective benefits rather than special benefits. Under humanized management, members of the organization are willing to cooperate and even sacrifice individual benefits, thus creating trust (Melé, 2003).

Trust, together with self-organization and power, markets, facilitate and sustain cooperation among people (Powell, 2003). The importance of trust for economic growth and social progress has been widely recognized. At a micro level, trust makes cooperation more efficient, and higher trust reduces transaction costs, and organizations with consistent ethics and values do not need stringent legal documents to regulate the relationship among members (Fukuyama, 1996). In certain cultures, and contexts, trust relationships can even replace third-party enforcement and become the guarantee of transactions (Grundmann et al., 2015). At a macro level, societies with high trust can conduct innovation and development orderly, and the welfare and competitiveness of a country is constrained by the trust of the country (Fukuyama, 1996). Trust is also an important component of social capital, and comparative analysis between northern and southern Italy suggests that social capital improves social efficiency through promoting voluntary cooperation and improving institutional performance (Putnam, 1993).

Trust is so important to any organization or society to cooperate, and it is essential

to maintain cooperation in a society, even the necessary basis for daily actions (Zucker, 1986). Johnston divided cooperative behavior into three dimensions, such as joint responsibility, shared plans, and flexible arrangements (Johnston et al., 2004). Sven Ivens argued that conceptual support contributes to the regulation of behavior, which not only creates value for business relationships, but also prevents opportunism (Sven Ivens, 2006). As a result, inter-organizational cooperation behavior is mainly manifested in information sharing and joint action. Srinivasan and Brush also divided inter-organizational cooperation behavior into three dimensions, namely special investment, information sharing and joint action (Srinivasan & Brush, 2006). The existing literature shows that humanized management not only generates trust, but also produces recognition, commitment and loyalty, which in turn promotes cooperation (Melé, 2003). The social exchange theory (social exchange theory) suggests that the principle of reciprocity makes people feel benefited and also make positive returns in the same way (Cropanzano & Mitchell, 2005). A culture of respect, care and service is reciprocal, which facilitates cooperation between each other (M. S. Granovetter, 1973). This reciprocal environment can stimulate organizational citizenship behavior, which continuously enhances the level of cooperation (Bolino et al., 2002). From the perspective of loyalty, loyalty brought by humanized management is expressed as recognition and respect for individuals and their rights, and attention to common interests (Melé, 2003).

From the perspective of business operations, research shows that humanized management brings better social performance due to trust, loyalty, and respect for stakeholders (Arnaud & Wasieleski, 2014). For a shopping mall, if its operators can

practice humanized management, they will respect the interests of shopping mall merchants, consider them, encourage their development, and thus enhance merchants' trust, loyalty, organizational citizenship behavior, and promote cooperation. Considering that cooperative behavior is the basis for the healthy development of the shopping mall ecology (C. Yiu & Xu, 2012), humanized management in the shopping mall will help to improve the ecological health of merchants. Based on this, the following hypotheses are proposed:

Hypothesis 1: The humanized management of the shopping mall contributes to the enhancement of the ecological health of merchants.

Peltoniemmi proposed that a mature business ecosystem should possess four characteristics, namely self-organization, emergence, co-evolution and adaptability (Peltoniemi, 2004). Iansiti and Levien suggested three criteria to evaluate the health of a business ecosystem, including productivity, robustness and creativity of gap markets (Iansiti & Levien, 2004). This implies that a business ecosystem is mainly built up to facilitate the exchange of benefits between businesses and customers by establishing an interdependent platform for interaction, in order to reduce operating costs and achieve a win-win situation for the stakeholders in the system. At the micro level, Den Hartigh developed enterprise-level ecosystem health indices based on Iansiti's three criteria (den Hartigh et al., 2006). Song further proposed to measure enterprise-level ecosystem health from three aspects, namely system connectivity, relationship predictability and partner diversity (Song et al., 2018). This suggests that a healthy business ecosystem can be reflected from four aspects, namely profitability, system connectivity, relationship predictability and partner diversity. In this context,

Hypothesis 1 can be further broken down into the following four sub-hypotheses:

Hypothesis 1a: The humanized management of the shopping mall helps to enhance the profitability of merchants.

Hypothesis 1b: The humanized management of the shopping mall helps to enhance the system connectivity of the merchants.

Hypothesis 1c: The humanized management of shopping mall helps to enhance predictability of merchant relationships.

Hypothesis 1d: The humanized management of shopping mall helps to enhance partner diversity among merchants.

3.2 The impact of humanized management on merchants' fairness perception

The core of humanized management is to maintain dignity and promote welfare (M. Pirson et al., 2019). Interpersonal fairness itself includes respect and treating others with dignity. When people are treated with dignity, respect and courtesy, fairness is obviously achieved (Kabadayi et al., 2019). Thus, humane management and fairness are intertwined, and fairness is one of the core values of humane management (Camargo & Vázquez-Maguirre, 2021; Dessler, 1999; Korsgaard et al., 1995). Indeed, the original purpose of humane management is to reduce unfairness through social and economic methods.

From a humanized management perspective, people are the key and ultimate focus of any organization (M. Pirson et al., 2019), and the organization must recognize, respect and value the characteristics of each individual (Bédard, 2003). In humane organizations, members are treated fairly and engage in meaningful work that

encourages them to develop their potential (Melé, 2003). In this case, organization members will act out of free choice and mutual exchange--a spontaneous establishment of comprehensive fairness and a free order of mutual benefit and utility. For shopping malls, it is clear that its humane management also makes retailers feel respected and ultimately, they will perceive that they are treated fairly, thus enhancing their sense of fairness. Based on this, the following hypothesis is proposed:

Hypothesis 2: Humanized management of shopping malls is conducive to enhance retailers' fairness perception.

3.3 The mediatory role of merchants regards to the fairness perception

The distribution and management of resources within a shopping mall is not likely to be implemented with absolute fairness, thus leading to differences in the levels of fairness perception on the part of merchants. Fairness theory posits that fairness perception can affect the behavior and emotional responses of actors (Holbrook Jr & Kulik, 2001; Lind & Tyler, 1988). When individuals receive a decision from an organization, they respond to the outcome of the decision as well as the process through which the outcome was achieved (Cropanzano & Greenberg, 1997). When individuals are satisfied with an organization, they will experience emotional commitment to it. Empirical studies suggest that procedural fairness, in conjunction with distributive fairness, can assist in promoting satisfaction, which in turn has a significant effect on emotional commitment (Rifai, 2005). If employees perceive their organization to be fair in general, they tend to overlook unfair treatment, even when they receive it, which implies that fairness perception can, to some extent, buffer the decline of emotional

commitment (Bobocel & Mu, 2016). Other empirical studies also demonstrate a positive correlation between fairness perception and emotional commitment (Herda & Lavelle, 2011; Lemons & Jones, 2001). Meta-analytic results provide similar conclusions (Van Dierendonck & Jacobs, 2012). This implies that, after helping to elevate emotional commitment, high emotional commitment further contributes to cooperation. Existing studies suggest that fairness perception helps individuals to become aware of the reliability and value of the organization and team (Whitman et al., 2012), which in turn assists in enhancing their job satisfaction (Bernerth et al., 2016; Masterson et al., 2000; McFarlin & Sweeney, 1992; Mossholder et al., 1998; Wesolowski & Mossholder, 1997), job performance (Blader & Tyler, 2009; Brockner et al., 2009).

Across organizations, the importance of fairness perception is similarly observed. In various business activities, fairness as an ideology and appeal is an important foundation for sustaining social exchange relationships (Yilmaz et al., 2004). This is particularly the case when actors interact with the organizations that provide them service (Bowen et al., 1999; Holbrook Jr & Kulik, 2001; Seiders & Berry, 1998). This is because fairness perception helps to motivate cooperation (De Cremer & Van Knippenberg, 2002; Tabibnia & Lieberman, 2007) and to achieve cooperative equilibria (Fehr & Schmidt, 1999). For instance, under the perception of being treated fairly, a more powerful alliance management team can be formed among organizations (Johnson et al., 2002). Higher fairness perception also increases the embeddedness of procedures and policies, thus enhancing the stability of transactions among cooperation partners (Brockner, 2002). The team cooperation promoted by an enhanced sense of

fairness also facilitates knowledge sharing among managers (Jones et al., 1997; Masterson et al., 2000). Fairness perception also shapes the decision logic of cooperation partners, such as property logic, control logic, and relationship quality logic, which in turn affects their decisions on whether to form inter-firm alliances (Ariño & Ring, 2010).

In the literature on strategic alliances, fairness is also the basis of inter-organizational transactions, such as procedural fairness is considered a key factor in determining the behavior of cooperation partners (Lind & Tyler, 1988), which can create a favorable environment for developing specific assets (Sapienza & Korsgaard, 1996; Tyler, 1989). Studies suggest that when boundary spanner managers perceive that partner behaviors are fair, it helps to implement joint strategies formed between companies, and thus provides a guarantee for higher performance of companies (Luo, 2008). In practice, fairness perception helps with effective communication and mutual understanding among companies (Farh et al., 1997). In addition, fairness perception also helps companies to feel that partner behaviors are more predictable (Tyler, 1989), and predictability is an important indicator of measuring the health of an organizational ecosystem (den Hartigh et al., 2006; Song et al., 2018).

The perception of fairness/unfairness in response is more prevalent in those relationship-oriented, long-term business relationships (Paul et al., 2006). Especially in the context of strategic alliances, the levels of distributive fairness, procedural fairness and interactional fairness, respectively, have a significant positive impact on alliance performance (Luo, 2007). A more micro level of investigation showed that procedural fairness is positively correlated with the alliance's operational outcomes, and its effect

on alliance performance is mediated by trust (Luo, 2008). Herein, the joint perception of procedural fairness between the two sides of a strategic alliance is particularly important, and when the procedural fairness perception of both sides is high, the alliance's profitability is the strongest (Luo, 2005). In international investments, the fairness perception of the two sides of the joint venture can affect their decision logic (including property rights logic, control logic, and relationship quality logic), which in turn affects the joint venture's assessment of alliance efficiency and equity, and the decision to set up a joint venture (Ariño & Ring, 2010). In some concrete cases, such as in construction projects, the contractor's perception of procedural fairness can effectively reduce conflicts intensity and potential disputes (Aibinu et al., 2008), and even explain 38% of conflict intensity level and 46% of contractor's dispute propensity (Aibinu et al., 2011). Studies of Chinese PPP projects have also shown that procedural fairness can promote the cooperation between partners (Z. Zhang & Jia, 2010). Research also shows that in the cooperative behavior of builders, the fairness perception in previous cooperation experience will affect the future cooperative willingness between subcontractors and general contractors (J. Liu et al., 2017). In franchising business models, the higher the fairness perception of the franchisee, the more trust in the franchising model, the more satisfaction, and the less opportunistic behavior (Shaikh et al., 2018). In supply chain management, fairness perception is also significant for the cooperative relationship between the two sides (Jokela & Söderman, 2017). Thus, if merchants have a higher perception of fairness in shopping malls, it will help to promote the cooperative behavior between merchants and shopping malls, and they are also willing to cooperate with other merchants to promote the common

prosperity of shopping malls. The common prosperity of shopping malls is expressed as the benign commercial ecology of shopping malls. This means that higher fairness perception helps to promote merchants' cooperative behavior, which in turn helps its ecological health. Based on the above analysis, we propose the following hypothesis:

Hypothesis 3: Merchants' Fairness perception plays a mediating role between humanized management and ecological health.

Considering the four aspects of ecological health, including profitability, system connectivity, relationship predictability, and partner diversity, Hypothesis 3 can be broken down into the following four sub-hypotheses:

Hypothesis 3a: The fairness perception of merchants acts as a mediator between humane management and profitability.

Hypothesis 3b: The fairness perception of merchants acts as a mediator between humanized management and system connectivity.

Hypothesis 3c: The fairness perception of merchants acts as a mediator between humanized management and the predictability of relationships.

Hypothesis 3d: The fairness perception of merchants acts as a mediator between humanized management and diverse collaboration.

3.4 Moderating effects of digitalization

Retail as a function is the core of all economies: it links the various needs of consumers with the specialized products of producers. Essentially, these retail functions include classifying goods, logistics, transactions, and providing auxiliary services such as information. Traditionally, physical retailers have taken on these functions for the

most part. However, with the advancement of digital technologies, more and more traditional retailers are turning from offline to online through multi-channel strategies (Reinartz et al., 2019) or integrating their online and offline actions to create new business models (Jocevski, 2020), thereby transforming the business ecosystem (Grewal et al., 2021).

In the digital age, the online and offline retail forms have a complementary relationship, such as setting up an offline display room or store may have a positive impact on the online sales of multi-channel retailers—due to these synergies, full-channel retail has become the norm (Ratchford et al., 2022). Consequently, physical stores remain indispensable shopping places (Babin et al., 2021; Treadgold & Reynolds, 2020). Moreover, in the physical retail sector, shopping malls are an important form of in-store shopping (Elmashhara & Soares, 2020). At this time, the various physical stores in the shopping mall are still connected physically or digitally to form an interdependent and complementary ecosystem (Cozzolino et al., 2021). This business ecosystem is often based on platforms, mainly composed of four participants: the platform owner who controls the intellectual property and governance, the provider who acts as the platform's interface with the user, the producer who provides the product, and the consumer who adopts the product and service (Helfat & Raubitschek, 2018). It is still a cooperative business ecosystem: the platform owner is often under pressure to cooperate with the members of the business ecosystem to allow them to develop complementary innovations, cooperate to increase the overall value of all partners in the business ecosystem (Gawer & Cowen, 2012). Similarly, ecosystem members can create value by participating in collaboration (Gawer & Cowen, 2012).

In practice, digital platforms of shopping malls are generally operated by the mall's operators. The operators of the platform need to carefully balance business and technological decisions to ensure the innovation power of the commercial ecosystem (Zhu & Liu, 2018). This requires shopping malls to strengthen the governance of their ecosystems to continually increase the value of their commercial ecosystems (Van Alstyne & Parker, 2018). As previously mentioned, fairness perception is an important precondition for promoting merchant cooperation. In the same digitally empowered governance era, enhancing fairness perception remains an important way for mall operators to promote cooperation and build a good commercial ecosystem. It should be noted that fairness perception is a subjective perception, while the digital carrier is digital. The operation of digital platform relies on algorithms (Ratchford et al., 2022; J. Zhang et al., 2022), which can greatly reduce the problem of human-made unfairness. For example, the Internet provides a fast search channel that can search for substitutes in any product category and provide convenient access to detailed information about a product's non-sensory attributes (Ratchford et al., 2022).

Digitalization has been identified as a useful tool for providing more sophisticated and personalized management services in the Native American style (Fernández-Rovira et al., 2021). Through the use of digital methods, shopping centers can collect and analyze individualized information and data from their merchants, which can facilitate personalized management of the merchants. For instance, shopping centers can provide targeted assistance to merchants based on their sales categories and performance levels, creating a more humanized experience for the merchants.

Moreover, digitalization can enhance communication efficiency and transparency

(Mazur-Wierzbicka, 2021), promoting collaboration and openness between shopping centers and merchants. By leveraging digital means, shopping centers can establish efficient communication channels, facilitating timely and convenient communication between merchants and the shopping center. Additionally, digitalization can improve information sharing and knowledge management, fostering collaboration and innovation within the shopping center.

Furthermore, digitalization can promote a sense of belonging and participation among the merchants (Scherpen et al., 2018). Digital transformation provides ample opportunities for enhancing merchant satisfaction and loyalty. By utilizing digital means, shopping centers can better motivate merchants to showcase their creativity and innovation, assisting them in achieving diversified development within the shopping center. Such a humanized management approach can increase merchant satisfaction and loyalty, reduce the attrition rate of high-quality merchants, and facilitate the competitiveness and sustainable development of the shopping center. Therefore, the introduction of digital technology can help to strengthen the role of humanized management in promoting fairness perception. Based on the above analysis, we propose the following hypothesis:

Hypothesis 4: Digitalization will positively moderate the effect of humanized management on fairness perception.

The progression of digital technology has spurred the innovation of emerging retailing mode. Once the technology has been ignited to spark innovation, its evolution will be accelerated rapidly. As a significant digital representation of retailers, the application of social media (also known as Web 2.0) allows customers to interact with

peers and/or companies (Kaplan & Haenlein, 2010). Various platforms offer customers an integrated, personalized, and consistent shopping experience by combining interaction with businesses (Brynjolfsson et al., 2013; Verhoef et al., 2015).

Digital has been impacting the construction of business ecosystems in many ways. The first benefit brought by digital is that it helps to enhance profitability. For example, internet-based advertisements are more influential than traditional media (J. J. Brown & Reingen, 1987; Chikweche & Fletcher, 2010). Meanwhile, merchants can also employ digital technology to achieve precision marketing, accurately grasp the consumption behaviors and preferences of users, create stronger motivation for consumers, and save resources to reduce waste for sustainable marketing (McDonagh & Prothero, 2014). Though digital means merchants may be more dependent on e-commerce platforms such as Taobao and Amazon to reach customers, more importantly, it opens up new online channels for merchants in addition to building business ecosystems offline. Merchants' mastery of digital technologies contributes to their acquiring of partners over a larger scope and enables them to communicate and cooperate with partners at low cost. This implies that digital not only moderated the relationship between personalized management and fairness perception, but the moderating effect also influences the health of the ecosystem through fairness perception. Based on this, the following hypothesis is proposed:

Hypothesis 5: Digitalization will positively moderate the indirect relationship between humanized management and ecological health through fairness perception.

Likewise, considering the four aspects of ecological health including profitability, system connectivity, relationship predictability, and partner diversity, Hypothesis 5 can

be further broken down into the following four sub-hypotheses:

Hypothesis 5a: Digitalization will positively moderate the indirect relationship between humanized management and profitability through fairness perception.

Hypothesis 5b: Digitalization will positively moderate the indirect relationship between humanized management and system connectivity through fairness perception.

Hypothesis 5c: Digitalization will positively moderate the indirect relationship between humanized management and predictability of relationships through fairness perception.

Hypothesis 5d: Digitalization will positively moderate the indirect relationship between humanized management and diversity among partners in collaboration through fairness perception.

The theoretical framework of this study is depicted in Figure 3.1. Herein, we primarily discuss the effects of fairness perception on ecological health. Based on this, we further explore the mediating role of cooperative behavior as well as the moderating effect of digitalization.

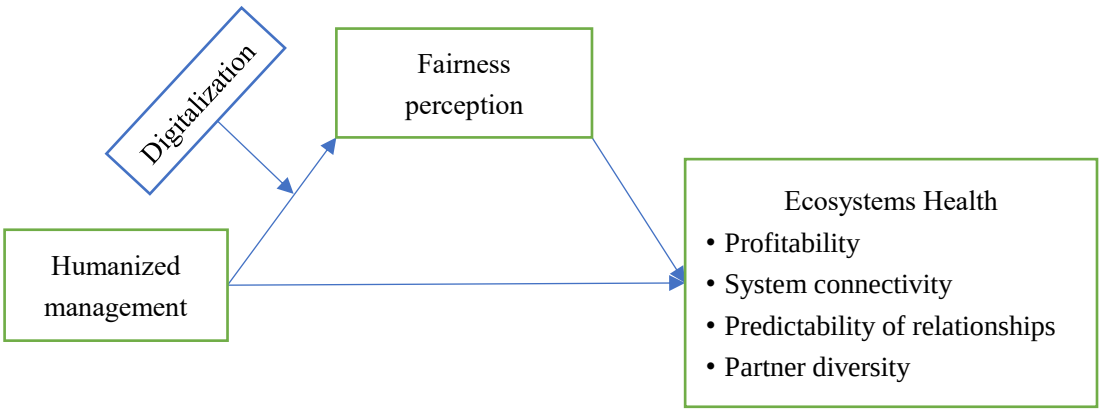

Figure 3.1 The theoretical framework of this study.

Chapter 4

Research Design

4.1 Questionnaire design and data collection

This study is based on the basic question of "Merchant Fairness Perception, Cooperation Behavior and Ecological Health". It is further divided into four sub-questions, namely, how does merchant fairness perception affect its ecological health? How does merchant fairness perception affect its cooperation behavior? Is there a mediation effect between cooperation behavior and fairness perception and ecological health? Is there a moderating effect between digitalization and fairness perception and cooperation behavior? The data needed for the study involves merchant-level fairness perception, merchant cooperation with shopping malls and peers, merchant digitalization, and individual ecological health scores of merchants. These data are all at the merchant level and scholars have mainly measured the above variables through scales. In view of this, this study adopts the questionnaire survey method to collect the data needed for the study.

In order to ensure the scientific and reasonable of the research, we followed the following process to complete the questionnaire design: first, form items through literature review and experience survey or interview in the enterprise sector; second, discuss with experts in the academic field; third, discuss with experts in the industrial field; third, purify the items through pilot test, and finally finalize the questionnaire. Specifically, the questionnaire design of this study went through four stages.

4.1.1 Documentary reading and field investigation

As part of the preparation for the research, we collected a large amount of literature related to business ecology, fairness theory, and cooperative behavior. Based on this, we also read a large amount of materials on the supermarket industry, including the current development of the industry, the operating model of typical shopping malls, the operating conditions of merchants, and media reports, forming a preliminary research framework. After a lot of reading and comparison, this study measured fairness perception through three dimensions: procedural fairness, distributive fairness, and interactive fairness, and the related scales were referred to studies to determine the preliminary measurement scales (Gilliland, 1993; Wallace et al., 2006). For merchant ecosystem healthiness, this study referred to studies to compile the scales (den Hartigh et al., 2006; Song et al., 2018). The design of the measurement items must be adapted to the specific industry context. To this end, we also formed a shopping mall management and merchant interview outline based on our understanding of the literature, and conducted multiple field surveys. Through interviews and field surveys, we compiled a merchant cooperation questionnaire based on the actual supermarket industry on the one hand, and revised some items of the fairness perception and ecological healthiness scales on the other hand to form a draft questionnaire.

4.1.2 Engaging in dialogue and discourse with academic experts

Following the inception of the questionnaire draft, we sought the advice of several professors in the fields of economics and organizational behavior. In particular, during the thesis title defense, the advisors gave highly professional and pertinent opinions on

the setting, wording, order of the questions in the questionnaire draft. In response to the academic experts' opinions, we repeatedly modified and perfected the questions. In this process, we focused on revising potential discrepancies in the wording, possible inducement problems, and the overall layout of the questionnaire.

4.1.3 Soliciting feedback from professionals in the business sector

The author himself operates a shopping mall with more than ten years of industry experience and is well-versed in the business of this industry, having accumulated considerable connections within the same industry. In order to ensure the quality of the questionnaire, we invited multiple shopping mall executives and merchant representatives to communicate and solicit their opinions on the survey questionnaire. After repeated revisions, we strive to make sure that the merchant representatives can clearly understand all the items in the questionnaire.

4.1.4 Predictive testing and purification

Following the above modifications, a furniture shopping mall in Guangzhou was chosen for the predictive test. In total, 250 questionnaires were issued, out of which 217 were collected. As the test subjects were merchants of the shopping mall operated by the author, a good relationship was maintained beforehand to ensure the authenticity of the feedback. Based on the issues reflected by the predictive test, appropriate modifications were made to the questionnaires, and finally the final version of the questionnaire was formed (Appendix for questionnaire).

Many items of the questionnaire of this study adopted the Likert five-point scale, requiring the questionnaire respondent to score according to the degree of accordance

with the statement, “1” indicating completely inconsistent, “2” indicating basically inconsistent, “3” indicating indeterminate, “4” indicating basically consistent, and “5” indicating completely consistent. In order to eliminate the interference of objective factors and ensure the respondents to answer accurately, we asked the store manager (storekeeper) to fill out the questionnaire to reduce the possibility of not answering the questionnaire due to the mismatch of the position. In addition, due to the extensive collection of various valuable opinions from experts, scholars, and business people on the questionnaire, the expression was adjusted, the simplicity and understandability of the questionnaire was emphasized, and the wording of the questionnaire was repeatedly modified to fit the specific industry context, thus reducing the possibility of error in answering due to ambiguity in item expression. Furthermore, according to the views of Knoke and Kuklinski, one of the methods to reduce measurement error in the questionnaire is to minimize the interview fatigue caused to the respondent (Knoke & Kuklinski, 1982). As the long scale is easily cause fatigue, anxiety, and decline of the respondent's attention, adversely affecting the quality of measurement, the time limit for completing the questionnaire was set to 10 minutes.

4.1.5 Data collection technique

For this research, five large shopping malls in Guangzhou were selected as the survey objects. As a millennium business capital, Guangzhou is one of the most developed cities in China for commercial and trading activities. In 2021, Guangzhou became the third city in China, after Beijing and Shanghai, whose total retail sales of consumer goods and total imports and exports of goods both exceeded one trillion RMB.

Therefore, taking shopping malls in Guangzhou as the research object has national significance. The survey questionnaire was distributed in two ways: first, professional survey companies were used to distribute the survey questionnaire to four large shopping malls a, b, c, and d. Among them, a is a comprehensive commercial tourism, cultural, educational, entertainment, social and commercial complex that gathers many domestic and foreign famous clothing brands and has diversified entertainment services such as international cinemas, skating rinks, and ocean worlds. b is one of the earliest shopping malls in mainland China. It integrates shopping, food, entertainment, leisure, and business, and gathers various brand goods in a large department store, including a large supermarket, a five-star movie theater, and more than 300 distinctive domestic and foreign brand stores. c and d are newly emerged shopping malls in recent 10 years, with high status in the business circles of Guangzhou. Second, the survey questionnaire was distributed to merchants in the furniture shopping mall e operated by the author. d is located in the Pearl River New Town of Guangzhou CBD, with more than 200 merchants settling in, and is the first home mall in Guangzhou to be operated in the form of department store. Its products cover the entire process from decoration stage to home life, integrating furniture, building materials and home decoration. The questionnaire was distributed through the property management of the mall, and anonymously submitted to ensure the acquisition of merchants' real thoughts. A total of 545 questionnaires were distributed, and 520 valid questionnaires were collected. The number of samples obtained from the five shopping malls and the proportion of

them to the total sample are shown in Figure 4.1.

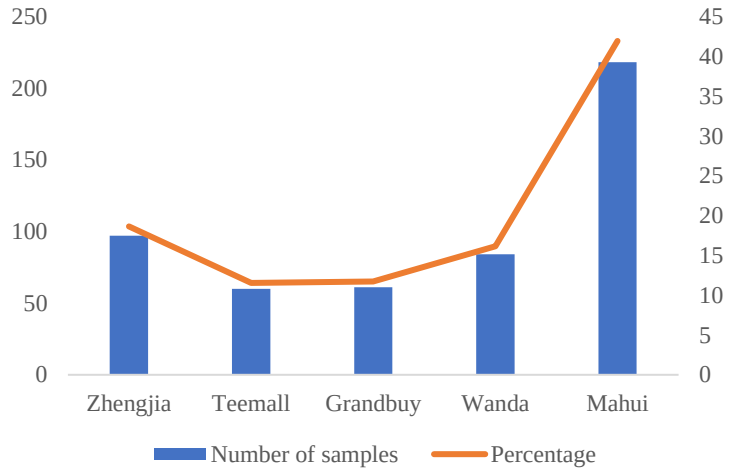

Figure 4.1 Illustration of Sample Distribution

4.2 Variable measurement

4.2.1 Dependent variable

We synthesized the methods to develop a scale to measure the ecological healthiness based on four aspects: profitability, system connectivity, relational predictability, and partner diversity (den Hartigh et al., 2006; Song et al., 2018). For profitability, we measured five items: "2021 sales volume reached the expected level", "2021 profit rate reached the expected level", "2021 investment return rate reached the expected level", "Sales volume increased compared to 2020", and "Profit rate increased compared to 2010". For system connectivity, we measured two items: "We have established relationships with many merchants in the mall" and "We have the ability to keep in close contact with many merchants in the mall". For relational predictability, we measured three items: "Our partners often meet our expectations", "We can easily understand the true intentions of our partners", and "We have enough information about

our partners to guide decisions". For partner diversity, we measure the Herfindahl-Hirschman Index (HHI) according to the formula: HHI = Σ (Si)2, where Si is the market share of the partner.

$$HHI = 1 - \sum_{j=1}^{n} \left(\frac{P_j}{P_t} \right)^2$$

In this study, we coded the cooperation organization of merchants into four categories, namely, homogeneous commodity merchants, complementary product merchants, suppliers and service providers, where Pj represents the number of partners in category j and Pt represents the total number of partners, and n represents the number of different types of partners. The HHI score ranges from 0 to 1, and the higher the score, the higher the diversity level of the partners.

4.2.2 Independent variable

The independent variable of this study is humanized management. Existing literature on humanized management is mainly qualitative research, and there is a lack of mature scales. However, humanized management implies respect, communication, perspective-taking, and consistency with relational leadership in the team. This study referred to the relational leadership scale developed by Carifio (Carifio, 2010), and extracted two dimensions, "care" and "inclusiveness", and combined them with the actual questionnaire of the shopping mall. The humanized management scale developed in this study includes items such as "the mall provides more growth opportunities for us", "the mall encourages our business", "the mall encourages us to progress and grow", "the mall cares for our health development", "the mall advocates

forming a good business model for us", "the mall encourages us to express our opinions", "the mall is good at accepting our suggestions", "the mall respects our way of doing business", etc.

4.2.3 Mediator

Measurements of fairness perception have been well-developed in the academic field. According to the view of Cohen-Charash and Spector, fairness perception can be divided into three dimensions, namely distributive fairness, procedural fairness, and interactional fairness (Cohen-Charash & Spector, 2001). Among them, distributive fairness refers to the fairness perception of the resources obtained (Huo et al., 2016); procedural fairness refers to the fairness of the means or process of making distribution decisions (Huo et al., 2016; M. Kumar & Kumar, 2016; Lind & Tyler, 1988); interactional fairness is related to people in organizational practices, including interpersonal fairness and informational fairness (Bies, 1986). For specific measurement methods, studies have compiled scales with high reliability and validity (Gilliland, 1993; Primeaux et al., 2003; Wallace et al., 2006). This study refers to the above studies, and combined with the practice of shopping mall management, compiled a scale. The items of distributive fairness include "The location allocated by the mall is reasonable" and "The level of rent charged by the mall is reasonable"; the items of procedural fairness include "The mall has the same management system for all merchants" and "The mall has the same service system for all merchants"; the items of interactional fairness include "The mall is willing to listen to our store's opinions and ideas", "When the mall makes important decisions, it will explain and communicate

with our store", "The mall treats all merchants equally in terms of information" and "The mall provides timely and rich business information feedback for merchants".

4.2.4 Moderator

For the retail industry, although the application of digital technology involves various processes such as production, storage, and sales, this study primarily focuses on collaborative behaviors within shopping malls, so we only pay attention to the digital transformation of merchants in sales. This study compiled a digital questionnaire for merchants from the three aspects of sales behavior, interaction, and after-sales, including items such as "Our store sells products or services through the Internet (mobile phones)," "Our store encourages customers to communicate product or service information through online interaction," and "Customers can perform after-sales of products or services online".

4.2.5 Control variables

The control variables of this study include the dummy variables of the shopping malls where the business is located, the operating time of the business, and the operating area, etc. Among them, in order to reduce the impact of different scales, this study carried out a logarithmic treatment on the operating area.

4.3 Models

This study employed the SPSS software for data analysis, including descriptive statistics of variables, reliability and validity analysis, correlation analysis and regression analysis. In order to test the mediating effect, the PROCESS plugin written

by Hayes was used.

As illustrated in Figure 4.2, mediating effect can be divided into full mediating effect and partial mediating effect. If the effect of humanized management on ecological healthiness is completely through fairness perception - no role of fairness perception, humanized management will not affect ecological healthiness (c'=0), it is full mediating effect; if the effect of humanized management on ecological healthiness is partially direct, and partially through fairness perception (c'>0), it is partial mediating effect. Therefore, the mediating effect c=a*b+c', where c is the total effect, c' is the direct effect after taking into account the mediating effect, a*b is the mediating effect, also known as the indirect effect.

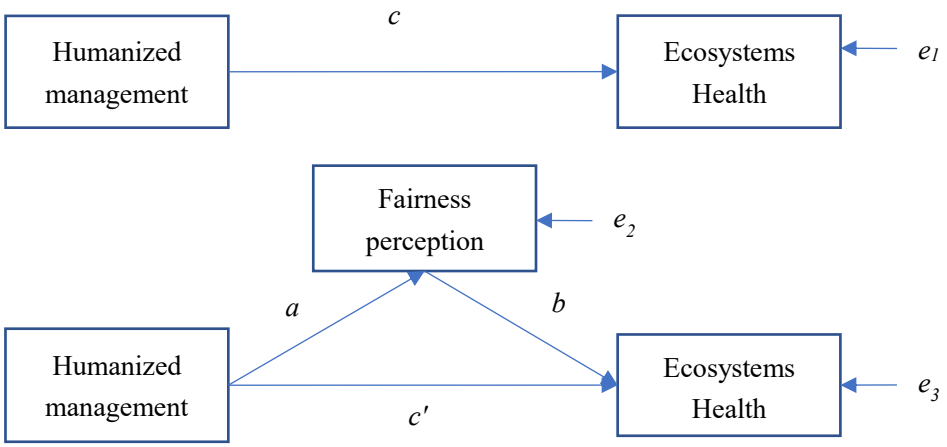

Figure 4.2: Diagram of Mediation Effect

We used the Bootstrapping method to test the mediating effect model in Figure 4.2. Bootstrapping method is a test method of non-symmetrical confidence interval for sampling distribution that is not normally distributed. The principle of bootstrapping method is that when the normal distribution assumption is not established, the sample is used to represent the population and sampling is carried out until n samples (such as

100) are obtained to form a sample. This process is repeated many times (k times), that is, multiple samples are generated, and an indirect effect estimate can be calculated for each sample, from which k values can be calculated to form an actual distribution.

The operating rule of PROCESS plug-in is consistent with the three-step method given by Wen: First, the relationship between independent variables and dependent variables is tested; second, the relationship between independent variables and mediating variables is tested; finally, the independent variables and mediating variables are added to the regression equation at the same time, and the change of the regression coefficient of the independent variables is observed (Wen & Ye, 2014). The specific model is as follows:

$$health = \alpha_0 + \sum \alpha_i x_i + c * humanization \quad (4.1)$$

$$fairness = \alpha_0 + \sum \alpha_i x_i + a * humanization \quad (4.2)$$

$$health = \alpha_0 + \sum \alpha_i x_i + c' * humanization + b * fairness \quad (4.3)$$

Considering that $health$ and $fairness$ are both continuous variables, Equations 4.1-4.3 are all OLS models. In the above models, if c is significant, it indicates that humane management has a significant impact on ecological health; if a is significant, it indicates that humane management has a significant impact on fairness perception; if c' is no longer significant or its significance decreases, it indicates that fairness perception mediates between humane management and ecological health.

If the relationship between X and Y is the function of variable M, M is referred to as a moderating variable. This implies that the relationship between Y and X is influenced by a third variable M. As shown in Figure 4.3, the effect of humane

management on cooperation behavior is affected by digitalization, which is a typical moderating variable model.

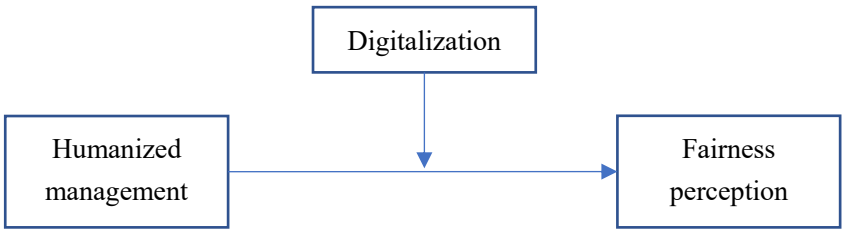

Figure 4.3 Illustration of regulatory effects

The following is the mathematical expression of the moderation effect model:

$$health = \alpha_0 + \sum \alpha_i x_i + c * humanization + d * digitization + e * humanization * digitization \quad (4.4)$$

If e is significant, it indicates the relationship between digitalized humanized management and ecological health. After combining Figure 4.2 and Figure 4.3, it is essentially a mediated regulation model. The Process program written by Hayes can be conveniently used to test the mediated regulation model. In addition, Hayes has written a SPSS plug-in for this Process program, which makes it easy for us to use SPSS to do empirical tests.

4.4 Validity and reliability testing

After obtaining the data from the questionnaire survey, this study will conduct validity and reliability tests. Only empirical research that meets the requirements of reliability and validity can have reliable and representative results. This section will conduct reliability and validity tests on the raw data obtained through questionnaire surveys to verify whether these data meet the standards for further empirical analysis.

4.4.1 Exploratory factor analysis and validity testing

Exploratory factor analysis should be conducted to evaluate the construct validity of the scale. Construct validity refers to the degree to which the scale measures the theoretical concepts or characteristics. The purpose of exploratory factor analysis is to find the latent structure of the scale, reduce the number of items, and make it a set of fewer but more highly correlated variables. Before carrying out exploratory factor analysis, KMO (Kaiser-Meyer-Olkin measurer of sampling adequacy) value and Bartlett spherical test value should be examined to determine whether the data is suitable for exploratory factor analysis. The Bartlett spherical test value is judged by whether it is significant, and the judgment criterion of KMO value is summarized in Table 4.1.

Table 4.1 Criterion for Judging the Suitability of Exploratory Factor Analysis KMO Statistics

KMO	The suitability of conducting exploratory factor analysis
Above 0.90	Very suitable for conducting exploratory factor analysis
0.8~0.90	Quite suitable for conducting exploratory factor analysis
0.7~0.8	Suitable for conducting exploratory factor analysis
0.6~0.7	Marginally suitable for conducting exploratory factor analysis
0.5~0.6	Not suitable for conducting exploratory factor analysis
Below 0.5	Not at all suitable for conducting exploratory factor analysis

Source: (Kaiser, 1974).

4.4.1.1 Assessment of the effectiveness of humanized management

This study measured the humanized management in malls with 8 items. After testing, the KMO value was 0.957, the Bartlett's spherical test value was 6387.830, and the significance level was 0.000, which indicated that it was very suitable for factor

extraction. In order to obtain the humanized management factor in this study, an exploratory factor analysis was performed using the principal component method, and Table 4.2 is the result of the exploratory factor analysis of humanized management. The results showed that the factor loadings of each measurement item were all more than 0.5, and the common factor explained 87.649% of the total variance of 5 items, indicating that the humanized management scale had good construct validity.

Table 4.2 Exploratory Factor Analysis of Humanized management

Measuring items	Factor loadings
The mall has created more growth opportunities for us.	0.943
It will encourage our operations.	0.955
It encourages us to progress and grow.	0.958
The mall cares for our health development.	0.951
It advocates forming a good business model for us.	0.927
It encourages us to express our opinions.	0.945
It is good at taking our suggestions.	0.906
It respects our business style.	0.902
Feature Value	7.012
Percentage of Variance Explained	87.649

Note: Principal component analysis was applied, and factors were extracted based on feature values greater than 1. The KMO value was 0.957, and the Bartlett sphericity test value was 6387.830, significant at 0.000 level.

4.4.1.2 Assessment of the effectiveness of digitalization

This study employed three items to measure the digitalization of merchants. The results of KMO test and Bartlett's test (KMO=0.734, Bartlett's $\chi 2$=821.264, $p<0.000$) indicated that the factor extraction is appropriate. To obtain the digitalization factor, an exploratory factor analysis with principal component method was conducted, and the results are presented in Table 4.3. The results show that all the factor loadings exceed 0.5, and the common factor accounted for 87.649% of the total variance, indicating that

the digitalization scale has good construct validity.

Table 4.3 Exploratory Factor Analysis of Digitization

Measuring items	Factor loadings
Online promotion of products.	0.917
Online interaction with customers.	0.900
Online sales of products.	0.878
Feature Value	2.422
Percentage of Variance Explained	80.749

Note: Principal component analysis was applied, and factors were extracted based on feature values greater than 1. The KMO value was 0.734, and the Bartlett sphericity test value was 821.264, significant at 0.000 level.

4.4.4.3 Assessment of the effectiveness of fairness perception

This study adopted 8 items to measure fairness perception. The KMO value was 0.926, Bartlett's spherical test value was 4621.315, and the significance level was 0.000, indicating that it was very suitable for factor extraction. In order to obtain the factor of fairness perception in this study, we used principal components analysis to conduct exploratory factor analysis, and Table 4.4 shows the results of exploratory factor analysis of fairness perception. The results showed that the factor loadings of all measurement items were more than 0.5, and the common factors explained 77.726% of the total variance of 8 items, indicating that the scale of fairness perception had good construct validity.

Table 4.4 Exploratory Factor Analysis of Fairness perception

Measuring items	Factor loadings
The mall is willing to listen to the opinions and ideas of our store.	0.921
The mall treats all the information provided by the merchants equally.	0.917
When the mall makes important decisions, it will explain and communicate with our store.	0.906
The mall implements a consistent service system for all merchants.	0.905
The mall provides timely and rich business information feedback for merchants.	0.904
The mall implements a consistent management system for all merchants.	0.904
The mall assigns reasonable locations.	0.822
The rent level charged by the mall is reasonable.	0.761
Feature Value	6.218
Percentage of Variance Explained	77.726

Note: Principal component analysis was applied, and factors were extracted based on feature values greater than 1. The KMO value was 0.926, and the Bartlett sphericity test value was 4621.315, significant at 0.000 level.

4.4.1.4 Assessment of the effectiveness of Ecological health

This research measures the ecological health from four aspects, i.e. profitability, system connectivity, relationship predictability, and partner diversity. Among these, profitability, system connectivity, and relationship predictability need to be tested for structural validity, while partner diversity is directly calculated without validity tests. To measure profitability, 5 items are adopted, and the KMO value is 0.862, Bartlett spherical test value is 4265.585 at significant level of 0.000, indicating that it is suitable for factor extraction. To obtain the fairness perception factors of this research, an exploratory factor analysis is conducted by using principal component method, and the result of the exploratory factor analysis of the profitability is presented in Table 4.5. The results show that the factor loading of each measurement item is over 0.5, and the common factor explains 90.655% of the total variance of the 5 items, indicating that the profitability scale has good construct validity.

Table 4.5 Exploratory Factor Analysis of Profitability

Measuring items	Factor loadings
The return-on-investment rate reached the expected level in 2021.	0.965
The profit rate reached the expected level in 2021.	0.963
The sales reached the expected level in 2021.	0.959
Compared with 2020, the sales increased in 2021.	0.943
Compared with 2020, the profit rate increased in 2021.	0.929
Feature Value	4.533
Percentage of Variance Explained	90.655

Note: Principal component analysis was applied, and factors were extracted based on feature values greater than 1. The KMO value was 0.862, and the Bartlett sphericity test value was 4265.585, significant at 0.000 level.

This study employed seven items to measure system connectivity. After testing, the KMO value was 0.862 and the Bartlett sphericity test value was 4265.585, with a significant level of 0.000, indicating that it was highly suitable for factor extraction. To obtain the system connectivity factors of this study, exploratory factor analysis was carried out by using principal component method, and Table 4.6 shows the results of the exploratory factor analysis of system connectivity. The results show that the factor loading of each measurement item is above 0.5, and the common factor explains 90.655% of the total variance of seven items, indicating that the system connectivity scale has good construct validity.

Table 4.6 Exploratory Factor Analysis of System Connectivity

Measuring items	Factor loadings
Other merchants in the mall often refer customers to our store.	0.891
Our store often refers customers to other merchants in the mall.	0.880
Our store has participated in the cooperation of the entire mall business form.	0.849
Our store has the ability to keep in close contact with many merchants in the mall.	0.841
Our store has established relationships with many merchants in the mall.	0.838
Our interactions with other merchants in the mall are frequent.	0.808
We have a very deep cooperation with merchants who sell complementary products.	0.728
Feature Value	4.881
Percentage of Variance Explained	69.722

Note: Principal component analysis was applied, and factors were extracted based on feature values greater than 1. The KMO value was 0.854, and the Bartlett sphericity test value was 3562.150, significant at 0.000 level.

This study measured relational predictability using three items. After testing, the KMO value was 0.788 and the Bartlett's test value was 2310.034 with a significant level of 0.000, indicating that factor extraction was suitable. To obtain the factor of relational predictability in this study, an exploratory factor analysis was conducted using the principal component method, and the results of the exploratory factor analysis of relational predictability are shown in Table 4.7. The results showed that the factor loadings of each measurement item were more than 0.5, and the common factor explained 95.761% of the total variance of the three items, indicating that the scale of relational predictability has good construct validity.

Table 4.7 Exploratory Factor Analysis of Relationship Predictability

Measuring items	Factor loadings
Our partners often meet our expectations.	0.980
We have enough information about partners to guide decision-making.	0.980
We can easily understand the true intentions of our partners.	0.976
Feature Value	2.873
Percentage of Variance Explained	95.761

Note: Principal component analysis was applied, and factors were extracted based on feature values greater than 1. The KMO value was 0.788, and the Bartlett sphericity test value was 2310.034, significant at 0.000 level.

4.4.2 Reliability testing

The purpose of reliability testing is to evaluate the consistency and stability of measurement on variables. Only when the reliability is accepted, the data analysis of the scale is reliable. The higher the reliability, the more stable and reliable the measurement is. Generally speaking, the more consistent the results of two tests or two tests are, the smaller the error is, and the higher the reliability is. In this study, Cronbach's Alpha value and Corrected Item-Total Correlation (CITC) of all variables in the variable are used to conduct reliability tests. Generally, CITC values should be greater than 0.5, and Cronbach's Alpha value can be accepted when it is above 0.70(DeVellis & Thorpe, 2021). The reliability test results of each variable in this study are shown in Table 4.8. It can be seen from the test results that the Cronbach's Alpha of Humanized Management is 0.980, the Cronbach's Alpha of Digitalization is 0.878, the Cronbach's Alpha of Fair Perceptions is 0.956, the Cronbach's Alpha of Profitability is 0.973, the Cronbach's Alpha of System Connectivity is 0.926, and the Cronbach's Alpha of Relationship Predictability is 0.978, all of which are greater than 0.8. At the same time, the minimum CITC value of Humanized Management is 0.816, the

minimum CITC value of Digitalization is 0.732, the minimum CITC value of Fair Perceptions is 0.705, the minimum CITC value of Profitability is 0.887, the minimum CITC value of System Connectivity is 0.734, and the minimum CITC value of Relationship Predictability is 0.947, all of which are greater than 0.7. Therefore, the reliability test results show that the internal consistency of each variable in this study is good and the measurement is reliable.

Table 4.8 Results of Reliability Test for Each Variable

Variables	Measuring items	Mean of the scale after the item is deleted	Variance of the scale after the item is deleted	CICT	Cronbach's α after the item is deleted	Cronbach's α
Humanized Management	Humanized Management1	35.75	137.656	0.924	0.977	0.980
	Humanized Management2	35.65	137.071	0.940	0.976	
	Humanized Management3	35.64	137.415	0.944	0.976	
	Humanized Management4	35.60	136.252	0.934	0.976	
	Humanized Management5	35.47	139.372	0.904	0.978	
	Humanized Management6	35.58	137.135	0.928	0.976	
	Humanized Management7	35.80	138.885	0.879	0.979	
	Humanized Management8	35.45	140.807	0.873	0.979	
Digitalization	Digitalization1	2.57	0.674	0.803	0.797	0.878
	Digitalization2	2.55	0.673	0.768	0.826	
	Digitalization3	2.47	0.635	0.732	0.863	
Fairness perception	Fairness perception1	35.19	125.708	0.778	0.954	0.956
	Fairness perception2	35.96	121.838	0.705	0.961	
	Fairness perception3	34.90	123.698	0.866	0.948	
	Fairness perception4	34.80	124.661	0.864	0.949	
	Fairness perception5	35.06	121.675	0.890	0.947	
	Fairness perception6	35.02	122.105	0.868	0.948	
	Fairness perception7	34.87	123.808	0.880	0.947	
	Fairness perception8	35.11	122.577	0.871	0.948	
Profitability	Profitability1	10.53	40.359	0.938	0.965	0.973

Variables	Measuring items	Mean of the scale after the item is deleted	Variance of the scale after the item is deleted	CICT	Cronbach's α after the item is deleted	Cronbach's α
	Profitability2	10.62	40.346	0.945	0.964	
	Profitability3	10.73	41.359	0.947	0.963	
	Profitability4	10.99	44.152	0.909	0.970	
	Profitability5	10.99	44.344	0.887	0.973	
System Connectivity	System Connectivity1	22.36	99.266	0.734	0.918	0.926
	System Connectivity2	22.53	96.791	0.824	0.909	
	System Connectivity3	22.67	97.375	0.840	0.908	
	System Connectivity4	22.38	95.427	0.789	0.912	
	System Connectivity5	23.05	100.586	0.640	0.927	
	System Connectivity6	22.29	96.580	0.773	0.914	
	System Connectivity7	22.28	96.385	0.777	0.913	
Relationship Predictability	Relationship Predictability1	7.90	16.308	0.955	0.965	0.978
	Relationship Predictability2	7.76	16.194	0.947	0.971	
	Relationship Predictability3	7.92	16.400	0.954	0.966	

4.5 Summary

The main content of this chapter is research design, which mainly expounds the research methods of this paper, measures the relevant variables, and introduces the selection basis and background of the research object to determine the sample source. On this basis, this chapter expounds the data collection and preprocessing of the research. Specifically: The first part introduces the questionnaire design and data collection methods of this research. This part first expounds the steps of questionnaire design in this research and the scientific standards followed in the design process. Secondly, this part introduces the data collection methods, indicating the sample source of this research and the distribution of samples in different malls. The second part, based on the variables involved in the theoretical analysis of chapter three, measures these variables. The dependent variable of this research is ecological health, and we refer to the measurement methods of existing research and measure it from four aspects: profitability, system connectivity, predictability, and partner diversity. The independent variable is humanized management. This research refers to the existing research and develops the measurement scale from 8 questions. The mediating variable is fairness perception. This research refers to the classic study to give the scale, combined with the actual business to develop a new fairness perception scale. The moderators are digital. This research measures from aspects such as online sales, publicity and interaction. In addition, this part also introduces the measurement of control variables in this research. The third part is the model testing strategy. In this part, we introduce the mediating effect model, moderating effect model and moderated mediating effect

model involved in this research. In order to empirically test the model, this research also introduces the PROCESS plugin written by Hayes. The fourth part conducts exploratory factor analysis, reliability and validity test on the collected samples, laying the foundation for the hypothesis test in the next chapter. The results show that the reliability and structural validity of the scales involved in this research meet the requirements of scientific research, and the data quality is good.

Chapter 5

Results

5.1 Descriptive statistics and correlation analysis

The descriptive statistics of the variables are shown in Table 5.1. As shown in Table 5.1, the mean values of humanized management and fairness perception are 5.088 and 5.016, respectively, indicating that the sample merchants perceived high humanized management and fairness, suggesting that the management of shopping malls in China is mainly humanized and merchants feel they are treated fairly. In terms of ecological health, the mean value of profitability is 2.692, indicating that the profitability of the sample merchants is not strong, which may be due to the serious adverse effects of the COVID-19 pandemic on the merchants of shopping malls. The mean values of system connectivity, relationship predictability and diversification index are 3.751, 3.930, and 0.404, respectively, indicating that the scores of the sample merchants in these aspects are also limited, with considerable potential for improvement. In addition, from the maximum and minimum values of the operating time and area of the sample merchants, the samples collected have a wide coverage and good representativeness.

Table 5.1 Descriptive Statistics Results

Variables	N	Min	Max	Mean	SD.
Humanized Management	509	1	7	5.088	1.676
Fairness perception	512	1	7	5.016	1.581
Digitalization	505	1	2	1.265	0.395
Profitability	515	1	7	2.692	1.617
System Connectivity	511	1	7	3.751	1.636
Relationship Predictability	520	1	7	3.930	2.008
Partner Diversity	400	0.00	0.750	0.404	0.197
Entry Time	515	0	15	4.656	3.036
Operating Area	505	1	2000	107.573	209.467

The results of the correlation analysis for the variables are presented in Table 5.2. The correlation coefficients of the four indicators of ecological health (profitability, system connectivity, predictability of relations and diversity index) with the indicators of humanized management, fairness perception and digitization were positive and significant in most cases, indicating that humanized management, fairness perception and digitization can help to improve the ecological health of the merchants (although in some cases the correlation coefficients were not significant). This suggests that the correlation analysis results are in line with theoretical expectations.

Table 5.2 Correlation Analysis Results

No.	Variables	1	2	3	4	5	6	7	8	9
1	Humanized Management	1								
2	Fairness perception	0.905***	1							
3	Digitalization	0.370***	0.378***	1						
4	Profitability	0.550***	0.570***	0.306***	1					
5	System Connectivity	0.054	0.095**	-0.026	0.161***	1				
6	Relationship Predictability	0.219***	0.249***	0.036	0.369***	0.805***	1			
7	Partner Diversity	0.162***	0.107**	0.280***	0.129**	-0.018	0.013	1		
8	Entry Time	-0.138***	-0.110**	-0.136***	-0.264***	0.218***	0.092**	-0.180***	1	
9	Operating Area	-0.421***	-0.387***	-0.259***	-0.483***	0.384***	0.220***	-0.174***	0.481***	1

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5.2 Direct effect analysis

Table 5.3 presents the regression results with profit capability as the dependent variable and "humanized management" as the independent variable, where M1 only contains the independent variable "humanized management". M2-M4 add variables continuously on the basis of M1. The results of M1 show that the regression coefficient of "humanized management" is significantly positive ($\beta = 0.532$, $p < 0.01$), indicating that merchants who perceive a higher level of humanized management have stronger profitability. In M2-M4, the regression coefficient of humanized management is still significantly positive and is significantly at the 0.01 level, indicating that the regression results are very robust. This result provides empirical support for Hypothesis 1a.

Table 5.3 Regression Results of Humanized Management and Profitability

Variables	Profitability			
	M1	M2	M3	M4
Humanized Management	0.532***	0.508***	0.420***	0.297***
	(0.032)	(0.033)	(0.035)	(0.038)
Entry Time		-0.100***	-0.043**	-0.054***
		(0.016)	(0.019)	(0.017)
Operating Area			-0.169***	0.237***
			(0.028)	(0.066)
Malls				Controlled
Constant	0.013	0.594***	1.145***	-0.494
	(0.139)	(0.175)	(0.199)	(0.399)
N	505	500	490	490
R^2	0.302	0.332	0.378	0.507
Adjusted R^2	0.301	0.329	0.375	0.500
F	274.988	150.959	125.971	88.452
p	0.000	0.000	0.000	0.000

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5.4 presents the regression results with system connection as the dependent

variable and "humanized management" as the independent variable, where M5 contains only the independent variable "humanized management" and M6-M8 further adds independent variables on the basis of M5. The results of M5 show that the regression coefficient of "humanized management" is not statistically significant (β = 0.053, p> 0.1), indicating that there is no significant correlation between the perception of humanized management and system connection. However, with the addition of control variables in M6-M8, the regression coefficients of system connection are all significantly positive (i.e. β = 0.074, p <0.1; β = 0.255, p <0.01; β = 0.296, p <0.01), indicating that after controlling some important variables, the higher the level of perceived humanized management, the higher the system connection of the merchants. This result provides empirical support for Hypothesis 1b.

Table 5.4 Regression Results of Humanized Management and System Connectivity

Variables	System Connectivity			
	M5	M6	M7	M8
Humanized Management	0.053 (0.042)	0.074* (0.042)	0.255*** (0.046)	0.296*** (0.046)
Entry Time		0.121*** (0.023)	0.007 (0.027)	-0.003 (0.026)
Operating Area			0.331*** (0.036)	0.000 (0.107)
Malls				Controlled
Constant	3.477*** (0.209)	2.802*** (0.249)	1.640*** (0.257)	3.329*** (0.616)
N	503	498	488	488
R^2	0.003	0.049	0.204	0.286
Adjusted R^2	0.001	0.045	0.199	0.276
F	1.579	14.757	46.936	28.663
p	0.209	0.000	0.000	0.000

Standard errors in parentheses；* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5.5 presents the regression results with relationship predictability as the dependent variable and "humanized management" as the independent variable, in which M9 only contains the independent variable "humanized management". M10-M12 are based on M9 and continuously add independent variables. The result of M9 shows that the regression coefficient of "humanized management" is significantly positive (β=0.263, p<0.01), indicating that merchants with higher perception of humanized management have higher level of relationship predictability. In M10-M12, control variables are continuously added, and the regression coefficient of humanized management is also significantly positive and significant at the 0.01 level, indicating that the regression results are very robust. This result provides empirical support for Hypothesis 1c.

Table 5.5 Regression Results of Humanized Management and Relationship Predictability

Variables	Relationship Predictability			
	M9	M10	M11	M12
Humanized Management	0.263***	0.275***	0.461***	0.423***
	(0.049)	(0.049)	(0.050)	(0.052)
Entry Time		0.079***	-0.039	-0.051*
		(0.024)	(0.028)	(0.027)
Operating Area			0.341***	0.074
			(0.038)	(0.112)
Malls				Controlled
Constant	2.591***	2.165***	0.956***	2.657***
	(0.233)	(0.270)	(0.272)	(0.651)
N	509	504	494	494
R^2	0.048	0.058	0.167	0.196
Adjusted R^2	0.046	0.054	0.162	0.185
F	29.458	20.243	52.128	26.785
p	0.000	0.000	0.000	0.000

Standard errors in parentheses；* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5.6 presents the regression results with cooperative partner diversity as the dependent variable and "humanized management" as the independent variable, where M13 only contains the independent variable "humanized management". M14-M16 add the independent variables successively based on M13. The result of M13 shows that the regression coefficient of "humanized management" is significantly positive (β = 0.022, p <0.05), indicating that the merchants who perceive a higher level of humanized management have a higher level of cooperative partner diversity. In M14-M16, the regression coefficients of humanized management are also significantly positive, all at the level of 0.01, indicating that the regression results are very robust. This result provides empirical support for Hypothesis 1d.

Table 5.6 Regression Results of Humanized Management and Partner Diversity

Variables	Partner Diversity			
	M13	M14	M15	M16
Humanized Management	0.022**	0.022**	0.020**	0.023**
	(0.009)	(0.009)	(0.009)	(0.010)
Entry Time		-0.013**	-0.010	-0.008
		(0.006)	(0.006)	(0.006)
Operating Area			-0.007	0.028
			(0.007)	(0.018)
Malls				Controlled
Constant	0.288***	0.340***	0.345***	0.134
	(0.051)	(0.056)	(0.058)	(0.110)
N	395	395	392	392
R^2	0.026	0.050	0.055	0.079
Adjusted R^2	0.024	0.046	0.048	0.062
F	6.435	6.283	4.670	3.697
p	0.012	0.002	0.003	0.001

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5.7 Regression Results of Humanized Management and Fairness Perception

Variables	Fairness Perception			
	M17	M18	M19	M20
Humanized Management	0.849*** (0.020)	0.858*** (0.020)	0.857*** (0.022)	0.795*** (0.024)
Entry Time		0.008 (0.011)	0.011 (0.014)	0.005 (0.014)
Operating Area			-0.003 (0.018)	-0.017 (0.051)
Malls				Controlled
Constant	0.717*** (0.117)	0.628*** (0.124)	0.629*** (0.132)	1.006*** (0.306)
N	505	500	490	490
R^2	0.820	0.821	0.821	0.840
Adjusted R^2	0.819	0.820	0.820	0.838
F	1777.233	930.967	599.561	337.322
p	0.000	0.000	0.000	0.000

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Overall, the results in Tables 5.3-5.6 demonstrate a positive correlation among the four indicators of humane management in shopping malls and the health of merchant ecology, indicating that the higher the level of humane management, the higher the level of merchant ecology health, thus providing solid empirical support for Hypothesis 1. Table 5.7 presents the regression results with fairness perception as the dependent variable and "humane management" as the independent variable, wherein Model 17 (M17) only includes the independent variable "humane management", and Models 18-20 (M18-M20) are based on M17 and continue to add independent variables. The results of M17 show that the regression coefficient of "humane management" is significantly positive ($\beta=0.849$, $p<0.05$), indicating that the higher the level of humane management perceived by merchants, the higher the level of fairness perception. In

M18-M20, control variables are continuously added, and the regression coefficients of humane management are also significantly positive and significant at the 0.01 level, indicating that the regression results are very robust. This result provides empirical support for Hypothesis 2.

5.3 Mediation analysis

Table 5.8 provides the results of mediation regression between fairness perception and humanized management on ecological health, among which, to compare the significance of regression coefficients more intuitively, the direct effect regression result of humanized management on ecological health was also included in Table 5.8. It can be seen from Table 5.8 that, compared with M21 and M4, after introducing mediating variable fairness perception into the model, the regression coefficient of humanized management became insignificantly positive ($\beta = 0.106$, $p > 0.1$) from significantly positive ($\beta = 0.297$, $p < 0.01$). This result indicates that fairness perception absorbed the effect of humanized management on profitability, mediating between humanized management and profitability. This result provides empirical support for Hypothesis 3a. When the dependent variable was system connectivity and relationship predictability, the hierarchical regression results were consistent with the dependent variable being profitability, such as M22 and M8, after introducing mediating variable fairness perception into the model, the regression coefficient of humanized management became insignificantly positive ($\beta = 0.021$, $p > 0.1$) from significantly positive ($\beta = 0.296$, $p < 0.01$); M23 and M12, after introducing mediating variable fairness perception into the model, the regression coefficient of humanized

management became insignificantly positive (β = 0.130, p> 0.1) from significantly positive (β = 0.423, p< 0.01). This result indicates that fairness perception absorbed the effect of humanized management on system connectivity and relationship predictability, mediating between humanized management and system connectivity, relationship predictability. This result provides empirical support for Hypothesis 3b and Hypothesis 3c. However, when the dependent variable was partner diversity, the regression coefficient of humanized management in M16 was significantly positive (β = 0.023, p< 0.05), after introducing mediating variable fairness perception into the model, the regression coefficient of humanized management was still significantly positive (β = 0.044, p< 0.05), indicating that fairness perception did not absorb the effect of humanized management on partner diversity, not mediating between humanized management and partner diversity. This result did not provide empirical support for Hypothesis 3d.

Table 5.9 presents the bootstrapping test results of the mediating effect of fairness perception between Humanized management and Ecological Healthiness by using PROCESS program. The results show that the mediating effect of fairness perception between Humanized management and Profitability is 0.1891, with a confidence interval of (0.0710, 0.3132); the mediating effect between Humanized management and System Connectivity is 0.2705, with a confidence interval of (0.1022, 0.4321); the mediating effect between Humanized management and Relationship Predictability is 0.2858, with a confidence interval of (0.1008, 0.4783). All three mediating effects have confidence intervals that do not include 0, thus indicating that these mediating relationships are significant. The mediating effect of fairness perception between

Humanized management and Profitability accounts for 64.0583% of the total effect, between Humanized management and System Connectivity accounts for 92.6687% of the total effect, and between Humanized management and Relationship Predictability accounts for 68.7019% of the total effect.

However, Table 5.9 also shows that the mediating effect of fairness perception between Humanized management and Partner Diversity is -0.0199, with a confidence interval of (-0.0460, 0.0073), implying that fairness perception does not mediate the relationship between Humanized management and Partner Diversity.

Table 5.8 Results of Hierarchical Regression for Mediating Effects

	Profitability		System Connectivity		Relationship Predictability		Partner Diversity	
	M4	M21	M8	M22	M12	M23	M16	M24
Humanized Management	0.297***	0.106	0.296***	0.021	0.423***	0.130	0.023**	0.044**
	(0.038)	(0.065)	(0.046)	(0.102)	(0.052)	(0.113)	(0.010)	(0.017)
Entry Time	-0.054***	-0.056***	-0.003	-0.003	-0.051*	-0.049*	-0.008	-0.007
	(0.017)	(0.017)	(0.026)	(0.025)	(0.027)	(0.026)	(0.006)	(0.006)
Operating Area	0.237***	0.244***	0.000	0.007	0.074	0.086	0.028	0.029
	(0.066)	(0.066)	(0.107)	(0.103)	(0.112)	(0.108)	(0.018)	(0.018)
Fairness Perception		0.237***		0.341***		0.359***		-0.028
		(0.077)		(0.106)		(0.122)		(0.019)
Mall	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Constants	-0.494	-0.742*	3.329***	2.991***	2.657***	2.290***	0.134	0.163
	(0.399)	(0.407)	(0.616)	(0.585)	(0.651)	(0.633)	(0.110)	(0.111)
N	490	486	488	484	494	490	392	390
R^2	0.507	0.517	0.286	0.303	0.196	0.208	0.079	0.087
Adjusted R^2	0.500	0.509	0.276	0.291	0.185	0.194	0.062	0.068
F	88.452	81.137	28.663	26.005	26.785	25.296	3.697	3.608
p	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5.9 Results of Bootstrapping Test for Mediating Effects

Variables			Effect	SE/ Boot SE	t	p	LLCI/ Boot LLCI	ULCI/ Boot ULCI	Relative effect
Ecosystems Health	Profitability	Total effect	0.2952	0.0381	7.7525	0.0000	0.2204	0.3700	—
		Direct effect	0.1061	0.0758	1.4000	0.1622	-0.0428	0.2549	—
		Mediating effect	0.1891	0.0617	—	—	0.0710	0.3132	64.0583%
	System Connectivity	Total effect	0.2919	0.0463	6.3089	0.0000	0.2010	0.3829	—
		Direct effect	0.0214	0.0910	0.2357	0.8138	-0.1574	0.2003	—
		Mediating effect	0.2705	0.0847	—	—	0.1022	0.4321	92.6687%
	Relationship Predictability	Total effect	0.4160	0.0601	6.9245	0.0000	0.2980	0.5341	—
		Direct effect	0.1302	0.1198	1.0870	0.2776	-0.1051	0.3655	—
		Mediating effect	0.2858	0.0962	—	—	0.1008	0.4783	68.7019%
	Partner Diversity	Total effect	0.0238	0.0078	3.0630	0.0023	0.0085	0.0390	—
		Direct effect	0.0437	0.0145	3.0183	0.0027	0.0152	0.0722	—
		Mediating effect	-0.0199	0.0136	—	—	-0.0460	0.0073	—

5.4 Mediation effect of digitalization

The interaction between Humanized Management and Digitalization is significant, which serves as the basis for conducting moderated mediation effect. To this end, this research first examines the moderating effect of Digitalization on the relationship between Humanized Management and Fairness perception. As shown in Table 5.10, when the dependent variable is Fairness perception, the interaction between Humanized Management and Digitalization is significantly positive ($\beta=0.066$, $p<0.01$), indicating that Digitalization positively moderates the relationship between Humanized Management and Fairness perception. This implies that compared to the merchants in the low Digitalization group, the Humanized Management cognition of the merchants in the high Digitalization group has a greater role in promoting Fairness perception. This result provides empirical support for Hypothesis 4.

Figure 5.1 provides an intuitive illustration of the relationship between digital forward regulation, humanized management and fairness perception. It can be seen that humanized management is beneficial to improve the level of fairness perception for both low digitalization and high digitalization groups. However, compared with the merchants in the low digitalization group, the merchants in the high digitalization group have a larger slope, indicating that the perception of humanized management of the merchants in the high digitalization group has a greater effect on improving the perception of fairness than that of the merchants in the low digitalization group.

Table 5.10 Results of Moderating Effects of Digitization

Variables	Fairness Perception	
	M25	M26
Humanized Management	0.770***	0.790***
	(0.026)	(0.024)
Digitalization	0.048	-0.261**
	(0.035)	(0.110)
Humanized Management * Digitalization		0.066***
		(0.021)
Entry Time	0.008	0.004
	(0.014)	(0.013)
Operating Area	-0.018	-0.016
	(0.051)	(0.048)
Mall	Controlled	Controlled
Constants	1.168***	1.071***
	(0.314)	(0.289)
N	476	476
R^2	0.836	0.841
Adjusted R^2	0.833	0.838
F	264.537	275.357
p	0.000	0.000

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

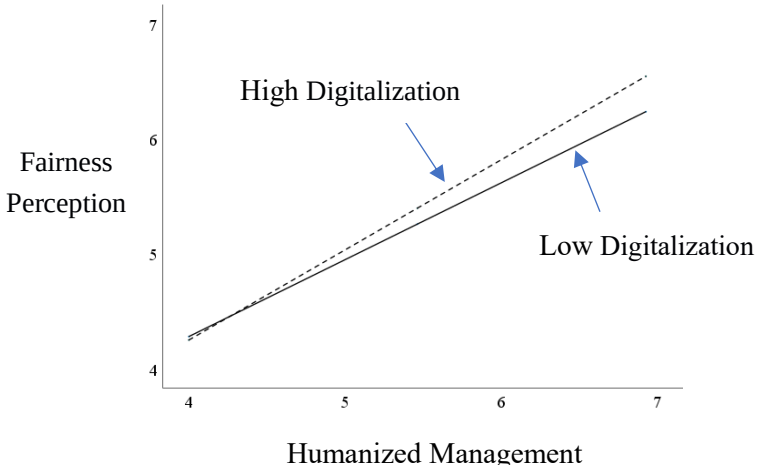

Figure 5.1 Diagram of Moderating Effect of Digitization on the Relationship between Humanized Management and Fairness perception

5.5 Moderated mediation analysis

Using the PROCESS program, this study obtained the conditional mediation effects under the different values of the moderator variable “digitization”. As can be seen from the results of the conditional mediation effects in Table 5.11, the mediation effects of the high digitization group are higher than those of the low digitization group in terms of dependent variables such as profit ability, system connectivity, relationship predictability, and partner diversity. Among them, when the dependent variables are profit ability, system connectivity, and relationship predictability, the confidence intervals of the different digitization groups do not contain 0, indicating that the mediation effects of the three are significant. However, when the dependent variable is partner diversity, the mediation effect of the low digitization group is -0.8583, the confidence interval is (0.0126, -0.043), and the mediation effect of the high digitization group is 0.6671, the confidence interval is (0.015, -0.0518), both of which contain 0, indicating that the mediation effect is not significant.

Simply relying on the analysis of conditional mediation effect is insufficient to determine whether there is a moderated mediation effect. Therefore, Table 5.11 also reports the determination index obtained by PROCESS program calculation. The results show that when the dependent variables are profit ability, system connectivity, and relationship predictability, the indexes are 0.0173, 0.0209, and 0.0229, respectively, and the confidence intervals are (0.0036, 0.0373), (0.0038, 0.0453), and (0.0033, 0.0499), respectively, all of which do not contain 0, indicating that the moderated mediation effect is significant. This result provides empirical support for Hypotheses

5a, 5b, and 5c. However, Table 5.11 also shows that when the dependent variable is partner diversity, the index is -0.0022, and the confidence interval is (-0.0064, 0.0005), which contains 0, indicating that the moderated mediation effect is not significant. This result does not provide empirical support for Hypothesis 5d.

Table 5.11 Results of Moderated Mediation Test

Variables	Digitalization	Conditional indirect effect				Moderating mediating effect			
		Effect	Boot SE	Boot LLCI	Boot ULCI	Index	Boot SE	Boot LLCI	Boot ULCI
Profitability	Low	0.1854	0.0586	0.0706	0.3022	0.0173	0.0087	0.0036	0.0373
	High	0.2141	0.069	0.0808	0.3517				
System Connectivity	Low	0.2289	0.0794	0.0742	0.3888	0.0209	0.0107	0.0038	0.0453
	High	0.2634	0.0922	0.0851	0.445				
Relationship Predictability	Low	0.2509	0.0941	0.0666	0.4363	0.0229	0.0122	0.0033	0.0499
	High	0.2889	0.1096	0.0762	0.5072				
Partner Diversity	Low	-0.8583	-0.0191	0.0126	-0.043	-0.0022	0.0018	-0.0064	0.0005
	High	0.6671	-0.0223	0.015	-0.0518				

5.6 Summary of the hypothesis testing

This chapter builds upon Chapter 4 to conduct data analysis and hypothesis testing. Firstly, we employed descriptive statistics and correlation analysis to obtain an understanding of the data involved in the study, as well as to preliminarily test the associated hypotheses. Then, we employed the PROCESS program to execute empirical analysis on the mediation variable model, moderating variable model, and moderated mediation model involved in the research. The results of the hypothesis test are illustrated in Table 5.12.

Table 5.12 List of test results of research hypothesis

Hypothetical statement			Results
H1	The humanized management of the shopping mall contributes to the enhancement of the ecological health of merchants.		Support
	H1a	The humanized management of the shopping mall helps to enhance the profitability of merchants.	Support
	H1b	The humanized management of the shopping mall helps to enhance the system connectivity of the merchants.	Support
	H1c	The humanized management of shopping mall helps to enhance predictability of merchant relationships.	Support
	H1d	The humanized management of shopping mall helps to enhance partner diversity among merchants.	Support
H2	Humanized management of shopping malls is conducive to enhance retailers' fairness perception.		Support
H3	Merchants' Fairness perception plays a mediating role between humanized management and ecological health.		Partial support
	H3a	The fairness perception of merchants acts as a mediator between humane management and profitability.	Support
	H3b	The fairness perception of merchants acts as a mediator between humanized management and system connectivity.	Support
	H3c	The fairness perception of merchants acts as a mediator between humanized management and the predictability of relationships.	Support
	H3d	The fairness perception of merchants acts as a mediator between	Not

Hypothetical statement			Results
		humanized management and diverse collaboration.	supported
H4	Digitalization will positively moderate the effect of humanized management on fairness perception.		Support
H5	Digitalization will positively moderate the indirect relationship between humanized management and ecological health through fairness perception.		Partial support
	H5a	Digitalization will positively moderate the indirect relationship between humanized management and profitability through fairness perception.	Support
	H5b	Digitalization will positively moderate the indirect relationship between humanized management and system connectivity through fairness perception.	Support
	H5c	Digitalization will positively moderate the indirect relationship between humanized management and predictability of relationships through fairness perception.	Support
	H5d	Digitalization will positively moderate the indirect relationship between humanized management and diversity among partners in collaboration through fairness perception.	Not supported

The hypothesis testing results showed that (1) humanized management of shopping malls could help enhance merchants' fairness perception and ecological health; (2) merchants' fairness perception acted as a mediator between humanized management and the three indices of ecological health (profitability, system connectivity, and relationship predictability); (3) for merchants in the high-digitization group, humanized management cognition had a greater effect on enhancing fairness perception than for those in the low-digitization group; (4) digitization had a positive effect on the indirect relationship between the three indices of humanized management and ecological health through fairness perception. To intuitively display the hypothesis testing results, we drew the relationship map among the variables (as shown in Fig.

5.2), wherein all solid arrows represented the influence between the variables.

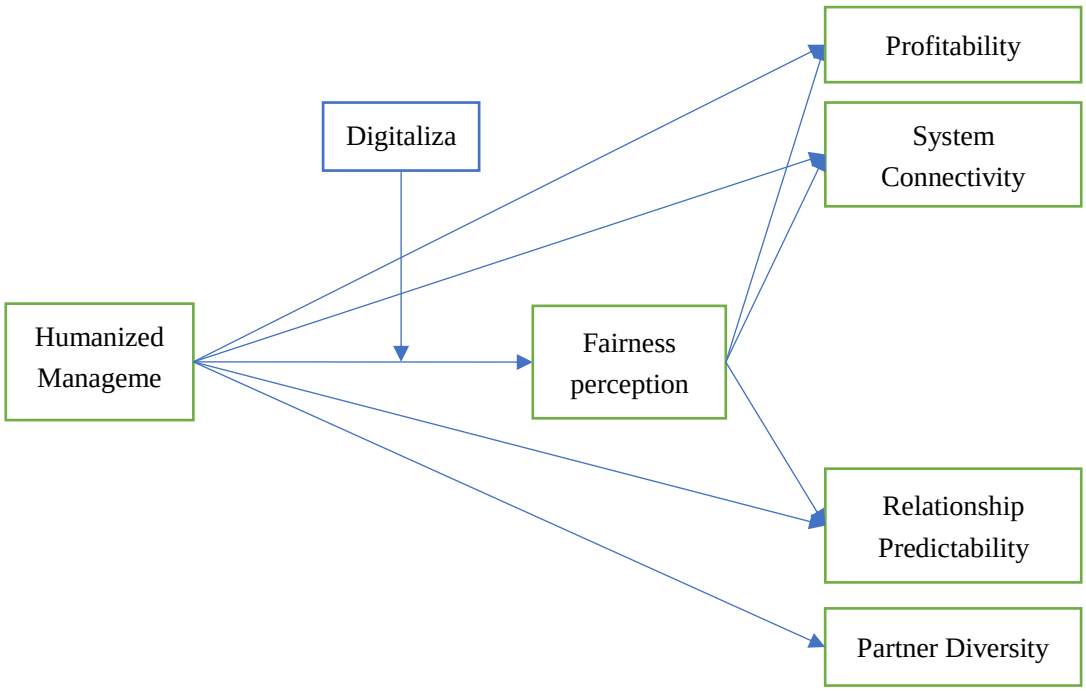

Figure 5.2 Hypothesis Testing Results Diagram

Chapter 6

Conclusions and Limitations

6.1 Conclusions

Economic behavior is shifting from individual independent behavior to network economics (Martinelli, 1994), with competition among single firms evolving into business ecology competition (Iansiti & Levien, 2004; Kapoor & Agarwal, 2017; Song et al., 2018). Especially in the era of digital transformation, this kind of competition based on business ecology has become increasingly fierce. Similarly, merchants in shopping malls also evolved from the original atomic competition to ecological competition. In this case, merchants must establish a "healthy" business ecology to establish a competitive advantage (den Hartigh et al., 2006; Song et al., 2018). Therefore, a deep study of the mechanism that affects the health of merchant ecology can help us understand the internal logic of the formation and sustainable development of business ecology. This study uses the survey data of merchants in five shopping malls in Guangzhou to empirically test the effect mechanism of humanized management on the health of merchants' business ecology under the background of digital transformation, and draws some meaningful conclusions:

First, humanized management of shopping malls helps to improve the health of merchants' ecology. Humanized management means respecting the interests of stakeholders and helps to build trust and loyalty (Arnaud & Wasieleski, 2014). For shopping malls that implement humanized management, they will respect the interests of merchants, enhance the level of trust of merchants, promote cooperation among

merchants, and thus improve the health of ecology.

Second, humanized management of shopping malls helps to improve merchants' perception of fairness. Fairness is one of the core values of humanized management philosophy (Camargo & Vázquez-Maguirre, 2021; Dessler, 1999; Korsgaard et al., 1995). In shopping malls that implement humanized management, merchants are treated fairly and shopping malls also encourage them to develop their potential. As a result, under the effect of trust and loyalty, merchants' perception of fairness is improved.

Third, merchants' perception of fairness plays a mediating role between humanized management and profitability, system connectivity and relationship predictability. Fairness is the foundation of organizational transactions and is considered to be the key factor determining the behavior of partners (Lind & Tyler, 1988). The findings of this study show that after humanized management improves fairness perception, it creates a good environment for merchants' development, and also helps to increase merchants' expectations of partners' behavior, thus improving the health of ecology.

Fourth, compared to merchants in the low digitalization group, merchants in the high digitalization group have greater effects on promoting fairness perception. Fairness perception is a subjective feeling, while digitalization is a carrier of digitalization. The operation of digital platforms relies on algorithms (Ratchford et al., 2022; J. Zhang et al., 2022), which can greatly reduce the problem of human unfairness. Therefore, the introduction of digital technology can further play a role in humanized management for fairness perception.

Fifth, digitalization positively moderates the indirect relationship between humanized management and profitability, system connectivity and relationship predictability through fairness perception. This result indicates that the mechanism of humanized management influencing the health of the ecology is complex, which helps us to better understand the mechanism of its role.

In addition, we can also find that there is a difference in the mediating effect and moderating effect of humanized management on different indicators of ecological health - although the mediating effect and moderating effect of profitability, system connectivity and relationship predictability are significant, the diversity of partners is not significant. This suggests that the perception of fairness does not improve the diversity of partners for merchants. The reason may be that improving the diversity of partners requires merchants not only to find diverse partners within shopping malls, but also to try to expand the diversity of partners in a larger scope beyond shopping malls. Therefore, the fairness perception of shopping mall operators does not have a significant impact on the diversity of partners.

In general, this study discusses the driving mechanism of the health of business ecology in the digital age from the micro level, expands the theory of business ecology system. Utilizing questionnaire survey data, this study empirically tests the effect of humanized management on fairness perception and business ecological health, further deepens our understanding of humanized management in business practice. Moreover, this study expands the research of humanized management and fairness perception from the organization to the structure between enterprises and markets, expands the application scenarios of humanized management and fairness perception theories.

Finally, the conclusion of this study shows that the good development of shopping malls depends on the cooperation behavior of real estate developers and merchants, and deeply discusses the micro influence mechanism, which is an important supplement to the existing literature.

6.2 Practical implication

With the changes in technology and social environment, the competition between shopping malls is becoming increasingly fierce. In recent years, digital transformation has caused a significant displacement effect on offline retailing. In this context, enhancing the ecological health of merchants is an important way for shopping malls to strengthen their competitiveness. This research has the following important implications for the commercial practice of shopping malls:

First, this study finds that humanized management has a positive effect on enhancing merchants' sense of fairness and constructing a healthy commercial ecology. Therefore, shopping malls should put themselves in merchants' shoes, create more growth opportunities for them, encourage their operations, encourage them to make progress and growth, care for their healthy development, promote them to form a good business model, encourage them to express their opinions, be good at accepting their suggestions, and respect their business mode. In addition, in business practice, it is also necessary to monitor merchants' sense of fairness, respect merchants, create an atmosphere of mutual trust, and enhance merchants' loyalty.

Secondly, the results of this study show that besides the influence of humanized management, digitalization also positively regulates the relationship between

humanized management and commercial ecological health. Therefore, merchants should also increase their investment in digitalization and actively embrace digital transformation. For merchants, they can actively interact with customers online, and promote and sell goods. For shopping malls, they can try to build a digital platform to create an integrated shopping ecology beyond serving merchants and customers, in order to enhance their competitiveness in the digital era.

6.3 Limitations

Social science research involves too many human factors, and human behavior is so complex that it is impossible to explain it perfectly with any existing theory. Thus, any model is incomplete and only abstracts one aspect of the phenomenon to be explained, standing alone. In the course of the research, this study strives to do better, but there are still the following shortcomings within the limited scope of this study:

First, the sample data of this study come from five very representative shopping malls in Guangzhou. Guangzhou is a famous commercial center in China. In the selection of shopping malls surveyed in this study, efforts were also made to cover various types of shopping malls such as traditional consumption, comprehensive, and professional, in order to enhance the universality of the research conclusions. However, we still need to pay attention to the fact that different shopping malls have their own characteristics, and culture in different regions will have a very important impact on the business activities of shopping malls. Therefore, when generalizing the conclusions of this study to all shopping malls, we still need to be cautious. Another issue about the survey is that in the process of the survey, although it is required that the respondents

of the questionnaire must be the responsible persons of the merchants, we still cannot be sure that the respondents are necessarily responsible persons. However, shop owners, managers, or general staff may have different opinions when answering questions, which makes it difficult to reflect the true situation.

Second, this study data comes from the same measurement questionnaire, which may cause systematic errors due to common method bias. In order to minimize the same source error as much as possible, we strive to narrow the same source error by setting objective questionnaire items in the design stage of this study. For example, for digital measurement, this study questionnaire not only has subjective innovation performance items, but also requires merchants to fill in objective data such as the proportion of online sales to total sales. However, the questionnaire response effect of this part of the objective indicators is not satisfactory, many questionnaires have missed filling problems, resulting in this study finally decided to use subjective digital measurement methods. The variable measurement based on subjective feelings also leads to another problem, that is, the measurement of humanized management seems to be consistent with the perception of fairness-if the former is measured by some objective management methods instead of customers' ideas, the results may be more reasonable.

Thirdly, the data used for hypothesis testing in this study was cross-sectional data collected through questionnaire surveys. Cross-sectional data is the data of different objects collected at one point in time, which is used to study certain phenomena at that point in time. Therefore, the conclusions obtained are essentially the correlation between variables, and more rigorous causal relationships need to be tested by

longitudinal research. For example, how the causal relationship between humanized management and ecological health is analyzed with data from several time points.

Fourthly, the relationship between variables may be more abundant, for example, there may be a problem of mutual causality between fairness perception and humanized management, that is, higher fairness perception may also help to improve the level of humanized management. For these issues, further research is needed in the future.

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