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The Impact of VR-based Service Innovation on Brand Equity

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

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

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ABSTRACT

The increasingly fierce competition in the service market have made service innovation a focal point of continuous attention and exploration in both academic and industry. The development of VR technology has provided new options for enterprises to innovate in services. However, employing VR technology for service innovation requires a certain level of cost investment and entails risks. Moreover, how using VR technology for service innovation will impact consumer cognition and behavior, and how this cognition will affect brand equity, remains unknown. These uncertainties hinder the application and development of VR technology in the service sector. Therefore, clearly understanding the benefits of VR-based service innovation is crucial. Against this background, this paper will analyze the effects brought by the use of VR technology in service innovation, providing guidance for enterprise service practices, with significant theoretical contributions and practical value.

Specifically, this research focuses on the impact of the application of VR technology in service innovation on businesses and consumers. Based on the consumer-based brand equity model, associative network memory model, and stereotype content model, it constructs a research model with service innovation as the independent variable, corporate associations, and brand equity as mediating variables, and consumer purchase intention as the dependent variable. It also includes the personal characteristics of consumers - novelty seeking, as a moderating variable. Through a mixed-method approach combining field

experiments and survey research, this research verifies the research model and hypotheses, obtaining the following conclusions:

First, VR-based service innovation can impact corporate associations. specifically, it can significantly enhance corporate competence association.

Second, VR-based service innovation enhances brand equity by enhancing corporate associations. That is, VR-based service innovation can improve corporate competence association, which further enhances brand equity.

Third, corporate competence association and brand equity play a chain mediating role between VR-based service innovation and consumer purchase intention. Specifically, VR-based service innovation can enhance consumers' corporate competence association, which through enhancing the company's brand equity, positively impacts consumers' purchase intention.

Fourth， novelty seeking moderates the relationship between service innovation and competence association such that higher novelty-seeking weakens the relationship.

In summary, this research focuses on the application of VR technology in service innovation, proposes a theoretical model of VR-based service innovation, and verifies its positive effects, internal mechanisms, and differences in effects at different levels of novelty seeking characteristics. It has certain contributions to the research of VR technology, service innovation, corporate association, brand equity, and other fields, and provides enlightenment for enterprises to make better use of VR technology for service innovation to enhance their brand equity.

Keywords: VR technology, service innovation, corporate association, brand equity, purchase intention

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Chapter 1 Introduction

1.1 Background

With the rapid development of modern services, and the ever-changing market demands of consumers, market competition in the service industry is becoming increasingly fierce. Innovating services to improve service efficiency and quality has become a focal point in the service sector. This is also an important means for companies to establish competitive advantages, enhance market performance, promote brand value, and gain consumer loyalty (Chapman et al., 2003; Ostrom et al., 2010; Thakur & Hale, 2013). As the importance of service innovation becomes more ingrained in the minds of industry practitioners, a variety of service innovation measures have emerged, such as optimizing service processes (Snyder et al., 2016), introducing new service products (Nijssen et al., 2006), and improving internal service management (Witell et al., 2016). However, it cannot be ignored that companies usually need to invest a certain cost and face certain risks when innovating services, yet the specific effects and benefits brought by service innovation are still unknown to some extent, which has become an obstacle to the development of service innovation. Which service innovation measures are effective? How to adopt effective strategies to improve services and innovate to enhance a company's brand equity and increase consumer purchases of company products remains an important issue of continuous concern and exploration in the service sector, both academically and industrially (Gustafsson et al., 2020).

As an effective category of service innovation, technological innovation has gradually attracted the attention of the national industry and academia. "The

National Development and Reform Commission and the State Administration for Market Regulation on Guiding Opinions on High-Quality Development of Services in the New Era" points out that to promote high-quality development of services, it is necessary to strengthen innovation in technology and promote the deep application of new generation information technologies such as artificial intelligence, cloud computing, and big data in the service field. With the help of policies, technology, and industry development, emerging technologies are increasingly used in the service industry. For example, robot technology is used in the service industry, with welcoming guide robots, delivery robots, etc., being introduced into Marriott, Hyatt, and other hotels and catering services; AR technology is introduced into scenic spot guides and exhibition displays; smart voice technology is used for product introductions, tourist guides, etc. The market size of related technologies continues to expand. For instance, according to the International Federation of Robotics (IFR) forecast, the global service robot market is expected to reach $29 billion by 2024; data from the China Electronics Society shows that China's robot market is currently in a stable growth stage, with the market size expected to reach 83.9 billion yuan by 2024. This further promotes research and practical applications of new technology used in service innovation in academia and industry. Currently, robot technology has been widely discussed and researched, but Buhalis and other scholars suggest that VR technology may become a new technological driving force for structural changes in the service industry in the future, thus the use of VR technology in the service industry needs attention (Buhalis et al., 2019).

Virtual Reality (VR) technology, developed at the end of the 20th century

(Hudson et al., 2019), features three main characteristics: immersion, interaction, and imagination (Brigham, 2017; Hudson et al., 2019; Lavoie et al., 2021). Due to its powerful capabilities, VR technology is gradually favored by the high-tech industry. For example, sportswear manufacturer Adidas collaborated with VR company Somewhere Else for a promotional campaign of the Adidas TERREX outdoor clothing and accessories series, offering users a VR experience. Users could climb the Drakensberg Mountains using VR headsets and two sensory remote controllers, sparking interest and stimulating purchase desire. Likewise, British fast fashion retailer Topshop teamed up with London's 3D company Inition to create a virtual experience of the London Fashion Show, allowing users to "virtually" sit in the show seats and watch the fashion show through VR headsets. Due to competition, VR technology is also introduced into automobile companies, such as Audi's collaboration with in-car entertainment developer Holoride to launch the "Experience rides" car VR experience, syncing users' visual and other sensory experiences to immerse them in the driving experience. Similarly, Toyota partnered with Oculus to introduce the virtual reality driving simulator "TeenDrive 365". In 4S shops, which is short for vehicle sales, sparepart, service and survey and authorized by the automobile brand manufacturer, VR technology is used for immersive car selection and test driving, offering convenience and time-saving benefits for a good shopping experience. The 4S shop Research indicates that using VR technology has many advantages, including providing consumers with a sense of presence (Flavián et al., 2019a; Tussyadiah et al., 2018; Willems et al., 2019), improving user experience (Hyun & O'Keefe, 2012), enhancing evaluations of brands and products (Tussyadiah et al., 2018), and promoting purchase intention

(Huang et al., 2016). As a result, the VR technology market has seen exponential growth in recent years. According to Goldman Sachs (2016), the VR software sales market alone is expected to reach $1.6 billion by 2025. VR technology continues to impact the entire service industry. Therefore, researchers must delve deeper into understanding how service innovations using VR technology in the service industry can affect consumer cognition and behavior, as well as how this cognition affects a company's brand assets. However, current academic research on VR technology in the service industry is still in its infancy. Empirical studies are limited and have not fully explored the impact of VR technology and its underlying mechanisms (Yung et al., 2021b), necessitating more substantial and theoretically grounded research (Huang et al., 2016; Yung & Khoo-Lattimore, 2019).

Furthermore, for the retail service industry, consumer personal characteristics are an important factor affecting service experiences and marketing effectiveness, especially regarding the use of new technologies. Yang et al. (2023) pointed out that personal traits significantly influence the marketing effectiveness of virtual dressing rooms. Consumers with a sense of novelty are more likely to engage in behaviors such as searching for product information, experiencing related technologies, and making exploratory purchases driven by curiosity (Chang & Lu, 2018; Min & Schwarz, 2022; Ni, 2021; Wang et al., 2022). Therefore, when employing emerging technologies like VR, consumer personal characteristics should be considered.

Based on this background, this research focuses on how VR-based service innovation in the retail service sector affect a company's brand equity and purchase intention. It explores whether VR-based service innovation can

enhance a company's brand equity and consumer purchase intention compared to traditional manual services. It further reveals and verifies the internal mechanisms involved. Additionally, this research examines the novelty-seeking trait of consumers as a moderating variable to explore its effect differences.

Given the research background, this paper poses the following research questions:

(1) How does VR-based service innovation impact corporate competence association and corporate warmth association?

(2) How does VR-based service innovation affect brand equity and purchase intention through corporate associations?

(3) Does the novelty-seeking trait of consumers moderate the relationship between service innovation and corporate associations?

1.2 Significance

1.2.1 Theoretical Significance

This research focuses on the application of VR technology in service innovation, based on the consumer-based brand equity model, associative network memory model, and stereotype content model, constructing a theoretical model on "the impact of VR-based service innovation on corporate associations, brand equity, and purchase intention" based on the stereotype content model, providing significant theoretical value as follows:

First, the research reveals the positive effects of VR-based service innovation on brand equity. Brand equity can reduce operating costs for businesses, create competitive advantages, and bring significant economic value to companies (Choi & Seo, 2021). Brand equity is an intangible asset that allows

companies to compete differently (Lang et al., 2022; Oh et al., 2020). In practical business applications, using emerging technologies like VR technology as an innovative service has become a common choice for improving market performance and brand value enhancement. However, whether such actions are effective in enhancing the company's brand equity and benefiting the company remains unknown. Current research has not answered this question. Existing studies on VR technology are mostly concentrated in areas like education and healthcare, focusing on its impact on consumer behavior, but neglecting its utility for businesses and brands; literature on service innovation also rarely explores the brand impact of emerging technologies. Therefore, the findings of this research, which show that VR-based service innovation can enhance a company's brand equity, enrich and expand the literature on VR technology, service innovation, and brand equity, providing a theoretical basis for further exploration into service innovation based on VR technology.

Second, the research finds that a company's competence association is more important than its warmth association, and more beneficial for enhancing brand equity and purchase intention. Previous studies on the stereotype content model in the brand domain found that when both competence and warmth associations are high, consumers develop positive feelings towards the brand, leading to positive brand attitudes and purchase intentions. But is there a difference in the impact of competence association and warmth association on consumer attitudes and behaviors? Grandey et al. (2005)' s research on service experience shows that although warmth association can affect the expected satisfaction of service experience, the influence of competence association on

expected satisfaction is seven times that of warmth association. Aaker et al. (2010) pointed out that warmth association can improve consumer satisfaction only when it appears in competent services. A small number of scholars have explored this, but more empirical research is still needed. Through empirical research, this research finds differences in the impact of competence and warmth associations on consumer attitudes and behaviors, especially in the technology sector, where a tech company's competence association more effectively enhances brand equity and purchase intention. This research further deepens the research on the stereotype content model.

Lastly, the research highlights the moderating role of the novelty-seeking personal trait of consumers. Personal characteristics of consumers are important factors affecting service experiences and marketing outcomes, especially for the use of new technologies. Previous research has focused on consumer traits like the "Big Five" personality traits, neglecting other characteristics. Gocowska et al. (2019) pointed out that novelty-seeking, as a personal trait, can influence individual decision-making and behavior. However, current research on novelty-seeking has mostly explored its physiological mechanisms and negative impacts, neglecting the positive effects of novelty-seeking, especially on consumer behavior. This research finds that novelty seeking moderates the relationship between service innovation and competence association such that higher novelty-seeking weakens the relationship.

1.2.2 Practical Significance

This research addresses the real need for companies facing constantly changing consumer demands and fierce market competition to enhance brand competitiveness through service innovation. It provides strategic guidance for

companies to adopt effective strategies for service innovation, offering practical significance.

First, tech companies should adeptly utilize emerging technologies, such as VR technology. This research finds that VR-based service innovation, compared to traditional manual service innovation, can enhance a company's brand equity and lead to more positive consumer purchase intentions. The findings offer effective guidance for better utilization of VR technology in service innovation. For example, VR technology can be introduced into the automobile 4S store for virtual model display. Through VR technology, the whole model series of related brands of automobiles can be displayed, including various configurations and colors of automobiles. Through virtual reality glasses or screens, consumers can browse and compare different models in a more intuitive and vivid way, fully understand the characteristics and advantages of different brands of cars, so as to better choose the models that meet their needs. 4S stores can also use VR technology to provide consumers with virtual test-driving services. Consumers can feel the fun of driving through VR technology without actually driving a vehicle, and experience the feeling of driving various models, including acceleration, turning, braking, etc. This virtual test driving can not only provide a more realistic driving experience, but also allow consumers to better understand the performance and driving experience of the vehicle before actual purchase. In addition, VR technology can also be used to customize the configuration display. Automobile 4S stores can use this technology to help consumers customize their ideal car configuration. Consumers can freely choose the color, interior, hub, accessories, etc. of the vehicle through the virtual reality environment to customize the car

configuration that meets their individual needs. By using VR technology, enterprises can therefore establish an advanced technology and innovative image in the minds of consumers, enhance consumers' trust in corporate capabilities, enhance brand equity, and effectively enhance consumers' willingness to purchase.

Second, tech companies should focus on enhancing competence association. This research finds that competence association can effectively improve a company's brand equity, thus enhancing consumer purchase intention. This enlightens enterprises to pay attention to the role of competence association. Especially for the automotive industry, companies should pursue strategies highlighting safety and industry-specific capabilities. Automotive companies can emphasize their strength and vehicle performance in promotional slogans or corporate/product introductions, enhancing consumers' associations with their competence. For special vehicle types, such as family cars, companies can emphasize warmth attributes along with capabilities to better enhance their brand equity, and stimulate their purchase intentions.

Third, tech companies should pay attention to consumer personal traits, as these can significantly influence their decision-making behaviors. This research reveals that consumer novelty-seeking traits can affect the relationship between service innovation and corporate competence association. However, identifying consumer traits should not be limited to this aspect. In their management practices, companies should fully recognize individual differences among consumers and establish comprehensive customer information databases. For instance, car sales companies can encourage consumers visiting showrooms to fill out personal information, current car ownership, preferred car brands, etc.,

through incentives such as gifts. The information collected should be systematically categorized, analyzed, and managed internally to identify potential customers, enhance new customers' loyalty to the brand, and maintain relationships with existing loyal customers.

1.3 Research Flow and Method

This research mainly discusses the influence mechanism of VR-based service innovation on brand equity and consumers ' purchase intention. At the beginning of the research, it is necessary to review and analyze the relevant basic theories and literature involved in the research issues of this paper, clearly define the concepts of relevant variables and the relationship between variables, and build a research model. An experiment and a survey are designed to obtain data to test the hypotheses in the theoretical model. The results are comprehensively analyzed and discussed. In order to ensure the scientific, rigorous, and effective results of the research, this research introduces advanced management science theory, follows standardized and rigorous research steps, and uses a variety of rigorous and scientific quantitative research methods to carry out solid and effective research in this paper.

1.3.1 Research Flow

First of all, after selecting a research topic originating from the managerial experience of the author, the thesis grasps the relevant literature in the fields involved in this research, including the relevant literature on VR-based service innovation, corporate association, brand equity, and purchase intention. This research also reviews the theories such as the consumer-based brand value model, associative network memory model, and stereotype content model, to

provide a solid foundation for the construction of the model. Based on this research framework, eight theoretical hypotheses are proposed that VR-based service innovation can trigger corporate association and then affect brand equity and consumer purchase intention.

1.3.2 Research Method

First, the field experiment was used in Study 1. The experimental method is a scientific research method that observes and measures phenomena by controlling and manipulating variables. It aims to verify hypotheses, establish causal relationships, and explore the effects of experimental interventions. The first study of this paper adopts the field experiment method, designs the experimental group with VR-based service innovation and control group without VR-based service innovation, and carries out the experiment between subjects. The field experiment was conducted in car 4S stores with the active consumers. In terms of subsequent measurement items, the validated scales of service innovation, corporate association, brand equity, and purchase intention in relevant research are used for reference.

Secondly, the survey method was conducted in Study 2. The questionnaire survey is an important data collection method for empirical research in management. The second study of this paper adopts the questionnaire validated method with the mature scales, including 6 items of service innovation scale, 3 items of corporate competence association scale, 3 items of corporate warmth association scale, 10 items of brand equity scale, 11 items of novelty seeking scale and 3 items of purchase intention scale. The questionnaire was formed to collect real consumer experience data and test the research model and related hypotheses proposed in this paper.

SPSS and Amos are the two main data analysis software in the thesis, including reliability and validity of the measurement scale confirm, and the research hypotheses testing using independent sample T-test, mediation effect test based on PROCESS and structural equation model.

1.4 Research Framework

This paper consists of five chapters.

Chapter 1: Introduction. This chapter mainly reviews the research background of service innovation in the service industry, the use of VR technology, and the importance of brand equity, describes the research background, research questions, and research significance, and introduces the main research methods used in this paper.

Chapter 2: Theoretical Foundation and Literature Review. This chapter first reviews and introduces the consumer-based brand value model, associative network memory model, stereotype content model, and other theories related to this research. Secondly, this chapter summarizes the core concepts and variables involved in VR-based service innovation, corporate association, brand equity, purchase intention, and other research, elaborates the relevant research in detail, and puts forward the theoretical gap of this paper to support the theoretical significance of this paper.

Chapter 3: Theoretical Hypothesis and Research Model. Based on the existing research deficiencies and research implications obtained from the literature review, this chapter will mainly focus on the theoretical derivation and hypotheses development of VR-based service innovation, and deduce the main effect and intermediary mechanism of VR-based service innovation and its different effects in the face of consumers with different levels of novelty seeking.

Chapter 4: Field Experimental Study of VR-based Service Innovation. This chapter uses field experiment to verify the hypotheses H1, H2, H3a, H3b, H4a, H4b. This chapter reports in detail the design ideas, data sources, processing methods, and results of the field experiments carried out.

Chapter 5: Structural Equation Model Analysis of Service Innovation. This chapter uses the method of questionnaire survey to collect data and constructs a structural equation model to repeatedly test all hypotheses. In this chapter, the data sources, reliability and validity of the scale, data processing methods, and hypothesis verification are reported in detail.

Chapter 6: Research Conclusion and Implication. This chapter summarizes the analysis process of the previous chapter and condenses the main conclusions of this paper. On this basis, this chapter discusses the theoretical contribution and practical implication of this paper with the theoretical dialogue and the theoretical gap mentioned in the literature review. Finally, the research limitations and future research directions of this paper are proposed.

Chapter 2 Theoretical Foundations and Literature Review

Based on the research background and questions, this chapter first reviews and summarizes the theoretical foundations of this research—the Stereotype Content Model and the Consumer-Based Brand Equity Model. Subsequently, it focuses on organizing and discussing the core concepts involved in this research, including VR technology, service innovation, corporate association, brand equity, and purchase intention. This serves to lay the theoretical groundwork for the formulation and argumentation of research hypotheses, as well as the execution and manipulation of empirical research.

2.1 The Stereotype Content Model

In society, people form inherent notions and views about members of certain groups, known as stereotypes. In 1995, Greenwald and Banaji proposed a clear definition of stereotypes from the perspective of implicit social cognition, defining them as the inherent views and expectations formed about a group through implicit, unconscious automatic processing, a specific type of social cognitive schema that guides people's behaviors. Early scholars primarily focused on the mechanisms and influencing factors of stereotype formation, gradually shifting to the study of the specific content of stereotypes. The specific content of early stereotypes covers a wide range, from group personality, such as witty, humorous, to ability, proficiency, etc. (Katz & Braly, 1933). However, it lacks a specific unified classification dimension, so it is unstable and unpredictable. Scholars began introducing different methods to systematically categorize stereotype content.

In 1998, Fiske et al. introduced the Stereotype Content Model (SCM，

Fiske et al., 2002), offering a new perspective for understanding stereotypes. From an interpersonal and intergroup interaction as perspective, they considered others' behavioral intentions and capabilities were important considerations in evaluating individuals or groups, proposing a two-dimensional model centered on warmth and competence. The SCM model contains four interconnected basic assumptions: (1) a two-dimensional structure hypothesis, where competence and warmth determine the distribution of out-group. Social groups can be divided into in-group and out-group. The in-group refers to the group in which members have a sense of unity, loyalty, intimacy and cooperation, and members consciously identify and belong to them psychologically. They hypothesizes that people in out-group refers to other social groups other than the in-group to which an individual belongs. This hypothesis indicates that people instinctively judge from two dimensions of warmth and competence when they encounter an out-group; (2) a mixed evaluation hypothesis, suggesting most stereotypes are mixed, with most groups evaluated as high-competence but low-warmth (HCLW) or low-competence but high-warmth (LCHW), and few as high-competence and high-warmth (HCHW) or low-competence and low-warmth (LCLW); (3) a social status hypothesis, where status and competition can predict stereotypes, with higher-status groups stereotypically viewed as competent but lacking warmth, and lower-status groups as warm but lacking competence; (4) a group preference hypothesis, indicating in-group preference and out-group derogation are prevalent in stereotypes (Zuo et al., 2006). While subsequent scholars proposed different dimensions of stereotype content, like conclusiveness and dynamism (Anderson & Sedikides, 1991); morality and ability (Poppe & Linssen, 1999), Fiske's warmth-competence two-dimensional

stereotype content model has been widely recognized and applied in academia.

Initially, the stereotype content model was used to describe group perceptions, such as racial stereotypes, with Jews viewed as competent but lacking warmth, and Blacks as lacking competence but having warmth (Fiske et al., 2002); in gender stereotypes research, women were considered warmer than men (Eckes, 2002; Fiske, 2010). The model was gradually applied to the field of individual perception. Kervyn et al. (2012) in a study on the metaphor effect of communication, noted that when narrators omit prominent, relevant information on a social perception dimension, listeners make negative inferences about the target on the neglected dimension, e.g., positive work competence leads to negative warmth inferences. Kervyn et al. (2016) further studied the compensatory effect in individual perception, where information on one dimension is perceived more extremely in a mixed rather than singular description context, e.g., individuals described as incompetent but warm are perceived as warmer.

As stereotype research developed, scholars expanded the research scope and depth of warmth and competence perceptions, extending from living (people) to non-living worlds (like countries, organizations, brands, and products) (Aaker et al., 2010; Barbarossa & Mandler, 2021; Bourdin et al., 2021; Feng et al., 2022; Liu et al., 2022; Pogacar et al., 2021; Pang & Bi, 2015). In 2012, Kervyn, Fiske, and Malone noting similarities between interpersonal perception content and processes and consumer brand cognition, introduced the Brands as Intentional Agents Framework. Based on Fiske's model, it classifies brands using capability and intent, dividing them into four categories: capable/benevolent, incapable/malevolent, capable/malevolent, and

incapable/benevolent. Different brand types evoke different emotions, with capable and benevolent brands inspiring admiration, and incapable but benevolent brands eliciting pity. Increasingly, scholars have researched brand associations (warmth and competence perceptions), examining their antecedents and consequences. In factors inducing brand associations, Pogacar et al. (2021) suggested brand name language characteristics affect gender associations, thereby influencing brand associations and consumer behavior, with feminine brand names conveying warmth perceptions and positively impacting consumer brand attitudes and choices. Zhang et al. (2022) focused on size cues in brand names, finding size cues evoke gender associations, affecting consumer enthusiasm and competence perceptions of the target brand, with smaller size-suggesting brands considered warmer but less competent, and larger size-suggesting brands considered less warm but more competent. Brand positioning, country stereotypes, and other factors also affect brand associations (Diamantopoulos et al., 2021; Gong et al., 2020). In terms of brand association effects, they influence brand evaluations, emotions related to the brand, consumer purchase intentions, and brand performance (Ivens et al., 2015; Kervyn et al., 2012). Kolbl et al. (2020) found brand associations (warmth and competence) affect consumers' perceptions of brand functional, emotional, and social values, with competent brands enhancing functional value perceptions, and stereotypically warm brands enhancing both functional and emotional value perceptions.

Aaker et al. (2010) also applied stereotypes to corporate cognition and evaluation, proposing the stereotype content model similarly applies to corporate image, with consumers using capability and warmth to assess

corporate image. Their research found, due to differences in career advancement conditions, reputation, etc., between for-profit and non-profit organizations, consumers perceive higher warmth in non-profit organizations and higher capability in for-profit organizations. Jiang et al. (2016) noted different dimensions of corporate image have varied impacts on consumers. Therefore, the SCM model is applicable to corporate research, providing a rational basis for this study.

By reviewing the research on the stereotype content model, it can be seen that the stereotype content model refers to the change in people's attitudes and behavior caused by their inherent views on things. Currently, the stereotype content model is applied to brands, countries, products, and other fields, with limited research on different dimensions of corporate associations as antecedent and consequent variables at the corporate level. In the service research field, existing studies prove the use of new technology (like robots) can affect consumer associations with a company and influence their purchase intentions (Liu et al., 2022), providing theoretical support for this study's exploration of using VR technology in services to enhance corporate brand equity and purchasing behavior.

2.2 The Customer-Based Brand Equity

Brand equity is an intangible asset for firms, with higher brand equity indicating stronger brand competitiveness (Rojas-Lamorena et al., 2022). Accumulating high brand equity and creating strong brands have become crucial objectives for enterprises. In 1993, American scholar Keller introduced the Customer-Based Brand Equity model (CBBE) on how to build powerful brands (Keller, 1993).

The theoretical foundation of the CBBE model is the associative network memory model, originally proposed by psychologists (Fan, 2000). Psychology suggests that memory in people's minds consists of a network of nodes and links connecting these nodes (Lin & Zhou, 2020), where nodes represent stored concepts or information, and links represent the relationships and strength of connections between pieces of information (Huerta-Álvarez et al., 2020; Sharma & Rahman, 2022). Any information encountered in daily life, whether visual (images, text), auditory (sounds), olfactory (smells), or tactile, can be stored in this memory network as nodes (Bergkvist & Taylor, 2022; Thomas & Fowler, 2021). Links connect nodes, and when one node in the memory network is activated, other nodes linked to it may also be activated to some extent (Neale & Corkindale, 2022), depending on the strength and length of the links between them (Dzyabura & Peres, 2021). The activation of nodes can be derived from the stimulation of external information or the activation of the internal long-term memory system (Boerman et al., 2021). For example, mentioning McDonald's might trigger associations with its iconic "M" logo and then its products like McChicken or burgers, which is an external stimulus; when activating the McDonald's node, not only is the logo recalled but also product prices, and memories of when, where, and with whom one last ate there, activating the internal long-term memory system. This activation process is known as the spreading activation process (Boronczyk & Breuer, 2021).

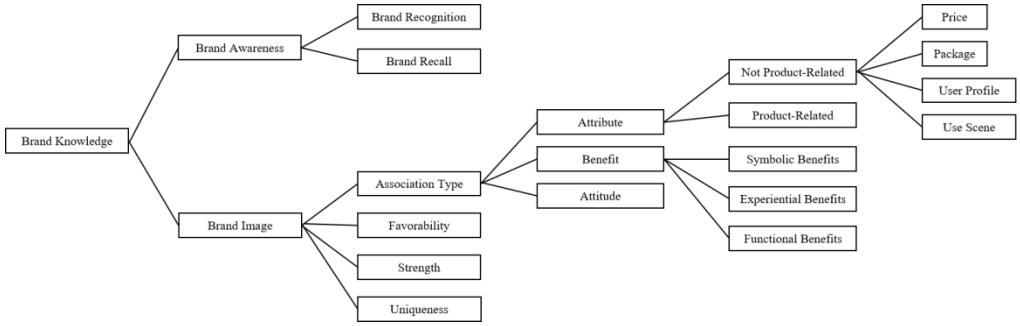
Keller, building on the associative network memory model, posited that brand knowledge stored in consumers' minds consists of nodes of brand information interconnected by links, proposing a structure of brand knowledge. He highlighted that the core of brand equity is the differentiated brand

knowledge based on brand associations (Dubbelink et al., 2021; Rojas-Lamorena et al., 2022). There are two pathways to creating differentiated brand knowledge: brand awareness and brand image (Abou-Shouk & Soliman, 2021; Tan et al., 2021). Brand awareness includes brand recognition and brand recall (Schivinski, 2021), where brand recognition refers to the consumer's ability to identify the target brand among a multitude of brands, and brand recall refers to the consumer's ability to retrieve a brand from memory without the brand being presented. Establishing brand awareness allows a brand to gain a competitive edge in the market, entering the "consideration set" of consumer purchase choices. Brand image is the collection of all associations consumers have with a brand, reflecting the brand's representation in consumer memory, which can be categorized into three types: attribute associations, benefit associations, and attitude associations (Lin et al., 2021; Pina & Dias, 2021; Yu et al., 2021). Attributes refer to product or service features; benefits refer to the value consumers derive from the product or service, both of which influence consumer product attitude (Roh et al., 2022; Sreen et al., 2021).

Based on the associative network memory model and Keller's brand knowledge map, companies can establish positive, strong, and unique associations in consumers' minds by offering differentiated services or products, thereby helping businesses create brand equity recognized by consumers and receiving positive consumer feedback (Mitra & Jenamani, 2020; Sun et al., 2021).

Figure 2.1

Brand knowledge map



Source. Keller (2006). *Strategic Brand Management*, *3rd Edition*. Prentice Hall.

The CBBE model primarily encompasses two perspectives: what elements constitute the creation of a strong brand? And how can a company build such a brand? Keller's CBBE model includes four dimensions that build upon each other in a pyramid shape: brand identification, brand connotation, brand response, and relationship. These dimensions are introduced as follows:

Brand identification represents the degree of consumer awareness of the brand, specifically including the breadth and depth of the brand (Büyükdağ & Kitapci, 2021; Krishna & Kim, 2021). The breadth of brand identification focuses on how well consumers remember the range, occasions, and scenarios applicable to the brand. A wide brand identification indicates that the brand is recalled by consumers in most of its applicable scenarios and situations. The depth of brand identification focuses on how easily and likely consumers can recall the brand. High ease of recall indicates deep brand salience. In practical brand management, the breadth of a brand is often overlooked by managers, but they should realize that narrow brand breadth can limit brand development because it means the brand is confined to fewer usage occasions in consumers' minds, reducing the number of times consumers use the brand. Therefore, brand

managers should seek ways to expand brand identification breadth, such as identifying and developing new usage occasions and opportunities for the brand and developing new methods of use.

Brand connotation consists of brand performance and brand image (Karagiannis et al., 2022). Brand performance describes how well a brand's product or service meets consumers' functional needs (Iyer et al., 2020). Brand performance includes five types of attributes: primary and secondary features of the product; reliability, durability, and ease of use of the product; emotional, efficiency, and effectiveness aspects of the service; product design and style; and product price (Garvin, 1984), with the first three quality-related attributes being determinants of brand performance. Brand image is the set of associations consumers have with a brand, reflecting the brand's image in consumer memory (Dash et al., 2021). Brand image may be built from personal usage experiences, brand advertising, or word-of-mouth recommendations from others (Alzate et al., 2022). Brand image includes user imagery, brand purchase and usage imagery, and the personality values and value of the brand (Mora & Ghosh, 2022). Creating strong, positive, and unique brand associations/images helps enhance consumers' feelings and judgments about the brand, thereby promoting consumers' purchase behavior (Aghekyan-Simonian et al., 2012; Hameed et al., 2021).

Brand response encompasses brand judgment and brand feeling (Smink et al., 2019). Brand judgment is consumers' personal preferences and evaluations of a brand based on direct or experiential bases (Fennis & Wiebenga, 2017). It is divided into attitudinal and behavioral levels, with the attitudinal level concerning how consumers view and evaluate the brand, and the behavioral

level concerning whether consumers consider purchasing the brand (Smink et al., 2020). Brand judgment is influenced by the aforementioned brand performance and brand image. Brand feeling is subjective, internal emotional responses consumers have towards a brand, such as excitement, security, and warmth (Hwang et al., 2021; Kahle et al., 1988). While the types of brand feelings are diverse, positive types invariably have a positive impact on consumers' behavior (Rust et al., 2021).

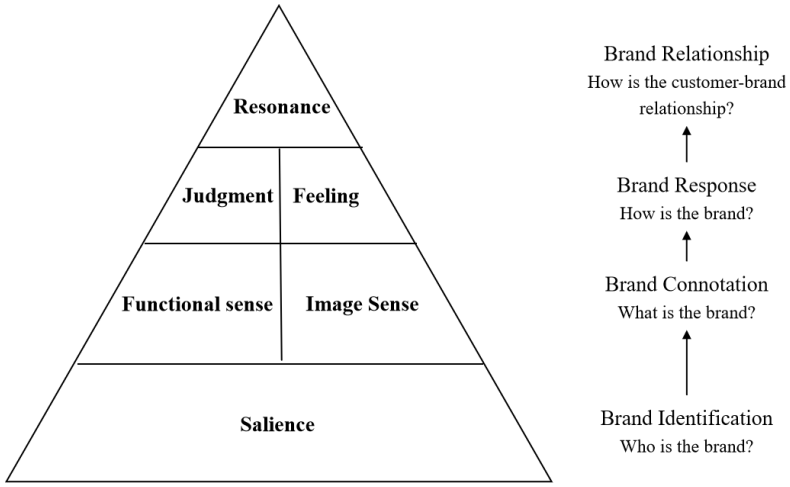
Brand relationship describes the state and connection between consumers and the brand, essentially brand resonance (Fetscherin et al., 2019; Khatoon & Rehman, 2021). Brand resonance refers to the extent to which consumers and the brand "share joys and sorrows" (Jang et al., 2021), including both emotional attachment and behavioral loyalty. Specifically, consumers who resonate with the brand show emotional attachment to the brand, and even reach a level of love for the brand; in action, it shows repeated purchase of brand products/services, recommendation of brand products/services to others, resistance to negative brand information, and conscious maintenance of brand reputation (Husain et al., 2022).

The four dimensions progressively build upon each other, providing guidance on how companies can create strong brands: by forming proper brand identification, offering positive and strong brand connotation, eliciting appropriate positive brand response, and thus creating a good relationship between consumers and the brand. The CBBE model emphasizes that strong, positive, and unique brand associations can lead to positive brand attitudes, thereby aiding consumers in making purchase decisions and ultimately enhancing brand sales. The CBBE model provides theoretical support for this

research's exploration of enterprises using VR technology for service innovation to induce corporate associations, thereby enhancing the company's brand equity and purchasing behavior.

Figure 2.2

CBBE pyramid model



Source. Keller (2006). *Strategic Brand Management*, *3rd Edition*. Prentice Hall.

2.3 Brand Equity

Brand equity is an intangible asset for enterprises and represents a competitive advantage for achieving differentiation (Lang et al., 2022; Oh et al., 2020). Currently, there is no consensus in academia on the definition of brand equity, with different scholars conceptualizing it from various perspectives. From a financial perspective, scholars have focused on the short-term benefits of corporate activities and their impact on financial statements. For example, Bonner & Nelson (1985) viewed brand equity as the calculable goodwill of a brand; Srivastava & Shocker (1991) identified it as the current and future profit earnings brought about by brand advantages established through various means,

such as marketing activities and social endeavors; Simon & Sullivan (1993) defined brand equity as the market value minus the value of tangible assets; while the Chinese "Enterprise Accounting Standards—Basic Norms" define brand equity as resources formed from past transactions or events, owned or controlled by the enterprise, expected to bring economic benefits to the enterprise. With the evolution of market competition, enterprises have realized the importance of building brand quality and capturing market share, leading scholars to propose definitions of brand equity from a market perspective. For instance, Dyson et al. (1996) described brand equity in terms of market share, considering it as the ratio of brand market share to actual market share. From the consumer perspective, the definition of brand equity emphasizes consumers' views and feelings about the brand, highlighting the importance of consumers in the process of building brand equity. Keller (1993) was among the first to define brand equity from this angle, arguing that the key to brand equity lies in meeting customers' needs, with its core being the differentiated brand knowledge based on brand associations, leading to the widely recognized and used CBBE model. Yoo & Donthu (2001) further defined brand equity as the differential response by consumers to brand and non-brand products with identical product attributes and marketing efforts. Fan (2000) suggested that brand equity should not solely consider the enterprise's profit situation but also consumer rights. Vredenburg et al. (2020) defined brand equity as the result of various marketing activities that consumers can perceive positively. Additionally, some scholars have proposed definitions of brand equity from the employee perspective, viewing it as the differentiation in employees' reactions to their work environment (King & Grace, 2009).

A review of the related research on brand equity reveals that current academic studies mainly focus on two areas: the dimension division and scale development of brand equity, and the exploration of factors influencing brand equity. Regarding dimension division and scale development, although different scholars have different divisions of brand equity dimensions, all agree that brand equity is a multidimensional variable. Yoo & Donthu (2001) divided brand equity into three dimensions: brand awareness and associations, perceived quality, and brand loyalty; Baalbaki & Guzmán (2016) categorized brand equity into four dimensions: perceived quality, brand preference, brand social influence, and brand sustainability. The following is a brief review of the dimensions of brand equity (Table 2-1). However, the focus of measurement in specific studies varies. For instance, Yu et al. (2018) in the study on the impact of consumer personalized customization on brand equity, used perceived quality to measure brand equity; He (2008) explored the effect of brand emotional constructs on brand equity and the mechanism of difference between domestic and foreign brands, utilized brand loyalty to reflect brand equity. Therefore, the division and measurement of brand equity depend on the specific research question and context.

Brand equity is often studied as a dependent variable to explore the impact of other factors on it, primarily within the fields of management and marketing. Reviewing related research on brand equity reveals that its influencing factors can be broadly categorized into corporate behavior elements, consumer psychology, and behavior elements.

Table 2.1

Dimension division of brand equity

Scholar	Dimension
Aaker(1991)	Brand Loyalty, Brand Awareness, Perceived Quality, Brand Association, Other brand proprietary assets
Keller (1993)	Brand Association, Brand Image
Rangaswamy et al. (1993)	Favor, Attitude Tendency, Behavior Preference
Aaker (1996)	Brand Value, Brand Personality, Corporate Organization Association, Brand Awareness, Market Share, Market Price, and Channel Coverage
Berry (2000)	Brand Awareness, Brand Connotation
Yoo & Donthu (2001)	Brand Awareness, Perceived Quality, Brand Loyalty
Washburn & Plank (2002)	Brand loyalty, Brand Awareness, Perceived Quality, Brand Association
Vázquez et al. (2002)	Product Symbolic Utility, Brand Name Symbolic Utility, Brand Name Functional Utility, Product Functional Utility
Pappu et al. (2005)	Brand Loyalty, Brand Awareness, Perceived Quality, Brand Association
Wang et al. (2006)	Brand Popularity, Brand Resonance, Brand Awareness, Brand Association
Wang & Chen (2007)	Brand Popularity, Brand Association, Brand Awareness, Brand Reputation, Brand Loyalty
Luo & Wei (2011)	Brand Awareness, Perceived Quality, Brand Association, Brand Relationship
Li & Yu (2011)	Brand Awareness / Association, Brand Quality, Brand Loyalty
Yuan & Gu (2015)	Brand Experience, Brand Image, Brand Association, Brand Awareness, Brand Loyalty, Perceived Quality
Zhong & Zhang (2015)	Brand Personality, Brand Reciprocity, Brand Courtesy, Relationship Status, Relationship Energy
Baalbaki & Guzmán (2016)	Perceived Quality, Brand Preference, Brand Social Impact, Brand Sustainability
Han et al. (2021)	Brand Familiarity, Perceived Quality, Brand Trust, Brand Reputation, Brand Identity
Stojanovic et al. (2022)	Cognitive Image, Emotional Image, Perceived Quality, Perceived Value
Hyun et al. (2024)	Brand Association, Perceived Quality, Brand Awareness

Corporate behavior includes marketing activities, corporate social

responsibility (CSR) practices, management measures, strategic initiatives (such as R&D innovation), and products and services offered by the company. Existing research has demonstrated that the credibility of brand endorsers can influence consumers' perceptions of the brand (attitudes and credibility), thereby affecting the company's brand equity (Ji, 2023). Lv (2023) found in his study on festival experience marketing that festival experience marketing can influence tourists' festival experience value, thereby affecting destination brand awareness, brand image, perceived quality, and brand loyalty, ultimately optimizing destination brand equity. Wang (2023) discovered that a company's R&D innovation behavior can enhance its brand equity. In the catering industry, culinary innovation has been proven to be a key driving factor for brand equity enhancement, as it can awaken customer interest, thereby affecting their perceived value and positively impacting brand equity (Luo, 2022). Moreover, internal management, such as employee management and supply chain management, can endear consumers to the brand, thus enhancing the company's brand equity (Kim & Cavusgil, 2009; Tavassoli et al., 2014). Good CSR is an important corporate behavior element that can affect brand reputation and word-of-mouth, influencing consumers' purchase decisions, and ultimately bringing brand equity and market performance to the company (Holt, 2002; Oh, 2000).

Consumer psychology and behavior include consumer values, consumer experiences, and co-creation behavior (Hyun et al., 2024; Souki et al., 2021). Consumers' consumption experiences can impact brand equity, with positive consumer experiences promoting brand equity (Guan et al., 2018). Shen et al. (2021) in the context of omnichannel retail, verified this conclusion, further confirming that customer experience value can positively impact brand equity.

They suggested that to enhance brand equity, retailers should actively integrate online and offline resources to provide consumers with better and more comprehensive shopping experiences. Wang et al. (2021), focusing on the fashion industry, also confirmed that consumer experiences can increase brand equity advantages, indicating that companies should better understand consumer preferences through social media information sources to improve their services. Consumer behaviors such as co-creation and participation can impact brand equity. Wan (2022) found in his study on rural tourism that the value co-creation behavior of rural tourists can positively affect their tourism experience value, thereby positively influencing the brand equity of rural tourism destinations. Customer co-created experience value has been proven to have a positive impact on brand equity. Companies should efficiently operate virtual brand communities to co-create satisfying brand experience value with consumers, enhancing their satisfaction and loyalty towards the brand, establishing a good brand image, enhancing brand competitiveness, and ultimately achieving brand equity enhancement (Nie, 2023). Additionally, customer participation behavior is also one of the factors influencing brand equity (Li et al., 2020)

Brand equity can reduce operating costs for companies, build competitive advantages, and bring significant economic value to companies (Choi & Seo, 2021). Therefore, exploring the formation elements and mechanisms of brand equity is of great importance (Du, 2019). The results of this study supplement the research on brand equity and are of significant importance.

2.4 VR-based Service Innovation

Virtual Reality (VR) technology, developed towards the end of the 20th

century, lacks a consensus definition in both academic and industry circles. Academically, Brigham (2017) views VR technology as an organic whole formed by the interaction between reality and virtuality. Hudson et al. (2019), from a technological standpoint, see VR technology as using computers to simulate the behavior of 3D entities such as people, places, and objects within a Virtual Environment (VE). Lavoie et al. (2021) focus on the sensory experience, describing Virtual Reality (VR) as a human-computer interface that can provide users with various physical sensations (e.g., visual, tactile, auditory). Seibert & Shafer (2018) start from the interaction between consumers and the environment, proposing that VR technology is a multimedia environment constructed through computer technology, characterized by high interactivity. It breaks away from the traditional media's "outsider" participation, offering consumers an immersive experience (Seibert & Shafer, 2018). Industrially, the "Virtual Reality Industry Development White Paper" defines VR technology as a new interactive system created by the simulation of the three-dimensional world, a computer simulation system. It can use computers to generate a simulated environment, an interactive 3D dynamic view, and entity behavior system simulation with multi-source information fusion, allowing users to immerse themselves in that environment. Synthesizing prior research, this research defines VR technology as a computer-generated 3D environment that users can manipulate through its technological carriers and obtain a multi-sensory immersive experience (Hudson et al., 2019; Lavoie et al., 2021).

VR technology is characterized by three main features: Immersion, Interaction, and Imagination. Immersion refers to the VR technology's simulated environments being so realistic that users find it hard to distinguish

between reality and virtuality, leading to a deeply immersive experience. For example, VR technology can simulate attractions (like the British Museum or the Louvre) and hotels (such as Marriott), providing users with an immersive product experience (Hudson et al., 2019). Interaction denotes the degree to which users can manipulate entities within the virtual environment and receive life-like feedback. For instance, in VR technology-based test-driving services, users can virtually test drive, control the steering wheel to adjust the car's speed and direction, and experience different perspectives. Imagination emphasizes the virtual environment's capacity for imagination, allowing users to construct and imagine beyond the constraints of time and space, explore, study, or accomplish tasks that are impossible in reality, such as using VR technology for house design.

With the widespread application of VR technology, it has garnered significant attention from multiple disciplines, leading to extensive research. A review of existing studies reveals a focus on VR technology's specific uses and impacts, primarily within the education, healthcare, and tourism sectors. Researchers often explore the effects of virtual environment factors, such as environmental conditions (e.g., color, decor, lighting, background music, crowding), space (e.g., layout, equipment, furniture), and personnel (e.g., staff) (Dad et al., 2018; Kim & Krishnan, 2015; Krasonikolakis et al., 2018). Dad et al. (2018) investigated the impact of environmental cues in 3D virtual retail stores, suggesting that these cues can affect shoppers' emotions (pleasure and arousal), thereby influencing their behavior. Krasonikolakis et al. (2018) found that virtual layouts of 3D stores could affect customer experience and purchasing behavior. Additionally, VR technology has been utilized to replace

real environments in experiments, such as Bruns & Chamberlain (2019), who used VR to substitute real-world scenes in a study on the role of landmarks in cognitive maps. VR has also been applied in creating collaborative learning virtual environments, virtual field trips, and virtual attractions (Hudson et al., 2019; Liaw et al., 2019; Schott, 2017).

Regarding the impact of VR technology, numerous studies indicate that VR can affect consumers' cognition, attitudes, and behavior. VR can provide consumers with a sense of immersion, engagement, and presence, leading to a flow experience (Flavián et al., 2019a; Tussyadiah et al., 2018; Willems et al., 2019). For instance, Hudson et al. (2019) in their study on VR underwater seascape exploration experience found that consumers' interactions with objects in the virtual world increased immersion in the virtual environment and had a significant positive impact on their satisfaction and loyalty. Pleyers & Poncin (2020) examined the use of VR technology in real estate sales, finding that VR could bring a sense of presence and stimulate imagination, improving consumer attitudes. Extensive research suggests that VR applications can enhance consumers' purchase intentions. Tussyadiah et al. (2018) found that the use of VR technology could increase tourists' preferences and liking for a destination, thus enhancing their willingness to visit. McLean & Barhorst (2022) found that compared to static image website technology, 360°VR tours could enhance pre-purchase stage consumers' visitation intent to hotels and post-purchase stage consumers' intent to revisit. However, it is crucial to acknowledge that while VR technology can have positive effects, it also has potential negative impacts. Yang et al. (2023) discovered that the use of emerging technology in virtual fitting rooms (VFR) in online shopping contexts could enhance purchase

intentions for consumers with relatively lower Body Mass Index (BMI) levels, but could cause self-image threats for consumers with higher BMI levels, thereby reducing their purchase intentions. Deng et al. (2019) demonstrated through experiments that VR experiences do not always bring positive visitation intentions. The use of interactive, vivid VR museum websites could reduce consumers' future intentions to visit the corresponding museums. Additionally, VR technology poses addiction risks (Merkx & Nawijn, 2021). Overall, there is still room for further exploration into the negative consequences of VR technology use and its boundary conditions.

From the overview above, it is evident that existing research has explored the conceptual definition and application effects of VR technology, providing a foundation for this research. However, some research gaps remain in the field of VR technology. First, regarding the application of VR technology, most studies treat VR as a tool for creating environments to explore the impact of other factors within virtual environments. However, the impact brought about by VR technology itself, as a product, should be emphasized. Second, in terms of the application fields of VR technology, it is widely used in education, healthcare, and other areas. Buhalis et al. (2019) suggested that VR technology might become a new technological driving force for structural changes in the service industry in the future, thus the use of VR technology in the service sector warrants attention. Regarding the application effects of VR technology, related research has examined the positive benefits VR technology brings to businesses and consumers, with most studies focusing on the impact of VR technology on consumer responses, especially its influence on purchasing behavior (McLean & Barhorst, 2022; Tussyadiah et al., 2018). However, some studies have pointed

out that the use of VR technology can also have negative consequences, but research in this area is currently limited. Therefore, the academic community needs to explore the boundary conditions of VR technology use.

Service innovation is crucial in service marketing and business management and has increasingly garnered attention from the academic community (Berry et al., 2006; Taques et al., 2021). There is currently no unified definition of service innovation in academia, but it is agreed that service innovation should possess at least one of the following characteristics: ① a service that is new to the world; ② a service that is new to the industry; ③ a service that is new to the company; ④ improvements to existing services, such as new service procedures/processes (Avlonitis et al., 2001; Tuomi et al., 2021). Zirger & Maidique (1990) defined service innovation as the difference between new and old services. Hipp et al. (2000) defined service innovation as new service products/service processes that are new to the firm and its customers, which can bring certain value to both the enterprise and consumers. Thakur & Hale (2013) adopted the concept of service innovation proposed by Hipp and others and conducted empirical research. De Luca et al. (2021) focused on the aspects involved in service innovation and conceptualized it from three dimensions, believing that service innovation includes innovation in service concepts, service processes, and customer experience. Lee et al. (2022) incorporated technological factors, considering that service innovation should include new service concepts, new customer interfaces, and new technology choices. Wu et al. (2022) proposed that service innovation refers to the integration (or re-bundling) of various owned resources to produce new resources valuable or beneficial to users in a given context. Therefore, this

research will follow the definition of service innovation by Thakur and Hale, considering service innovation as service products/service processes developed or used by enterprises that are new to consumers and enterprises, capable of improving consumer experiences and bringing certain benefits to the enterprise.

Through a review of the literature in the field of service innovation, it has been found that research on service innovation primarily focuses on two aspects: Firstly, more micro-level studies of service innovation, such as the development of new services and new service strategies within specific industries. For instance, Ordanini & Parasuraman (2011) focused on innovation research in the hotel industry, finding that collaboration between businesses and consumers and between employees can promote the number of service innovations, further expanding research on the antecedents of service innovation. Lee et al. (2022) concentrated on the catering industry, discovering through a survey of a hot pot restaurant that service innovation can impact brand reputation by influencing service quality and brand loyalty, supplementing research on the consequences of service innovation. In the telecommunications industry, Magnusson et al. (2003) explored the gap and contribution between users and professional service developers in service innovation through experiments. User involvement in service innovation should pay attention to four key elements: the objectives, stages, intensity, and modes of participation (Alam, 2002). For the high-tech service industry, service innovation is crucial. Van Riel et al. (2004), through empirical research from a decision-making perspective, discussed the factors for innovation success in the high-tech service industry, finding that successful service innovation positively correlates with decision-maker awareness and knowledge level. In addition, the organizational atmosphere conducive to

information sharing plays an active role in it. De et al. (2021) focused on big data marketing within the industry, developing a research framework to explore the impact of big data investments on service innovation and performance, finding that big data investment is an antecedent to service innovation. Secondly, more macro-level studies of service innovation, such as comparisons between countries. Alam (2002) focused on transnational differences in service innovation, taking emerging India and developed USA as research subjects to compare the development processes and stages of service innovation in financial service companies, proving that there are significant cross-national differences in service innovation. Song et al. (2000) collected data from multiple countries, including the USA, UK, Germany, Japan, and China, finding that the pioneer advantage of service innovation varies between countries.

From the above overview, it is evident that existing research has conducted certain explorations into service innovation, providing a theoretical foundation and insights for this study. However, it is observable that there are still shortcomings in existing research. First, given the importance of service innovation, the academic interest in service innovation has shown an increasing trend in recent years, but overall, research on service innovation is still relatively scarce (Grawe et al., 2009; Suchek et al., 2021), necessitating more rigorous empirical studies. Second, in terms of perspectives on service innovation, current research is mostly concentrated on cross-national differences at the national level, such as the United States, India, and Australia, and on industry perspectives (Alam, 2002; Thakur & Hale, 2013). There is a lack of research from a micro perspective, specifically studies focusing on enterprises. Third, in exploring the antecedents and consequences of service innovation, especially

the utilization of emerging technologies for service innovation, there is further space for exploration.

2.5 Corporate Association

Corporate association is the cognition of a company's brand by consumers. In terms of specific definitions and dimensions, different scholars have defined and divided the dimensions of corporate association based on different perspectives. In 1997, Brown and Dacin first defined corporate association and divided it into dimensions. They considered corporate association as people's cognitive collection of all information about a company, including knowledge of the company's past behaviors and evaluations of the company's overall or specific characteristics (Brown & Dacin, 1997), with the subject of the associations being all stakeholders of the company (Brown, 1998). Brown & Dacin (1997) identified corporate association as a two-dimensional variable, comprising corporate competence association and corporate social responsibility association. Corporate competence association refers to consumers' evaluations of a company's capacity, including information and knowledge about a company's proficiency in producing and delivering products/services, indirectly reflecting the company's performance in its field and industry (Yu et al., 2021). Corporate social responsibility association pertains to consumers' cognition of a company's stance and activities in social obligations, such as employee and consumer welfare, charitable activities, and environmental protection (Islam et al., 2021). In 1998, using qualitative research methods, Brown further proposed that corporate association should also include four dimensions: the ability to interact with partners, interact with employees, marketing factors, and product factors (Brown, 1998). Gürhan-Canli & Batra

(2004) argued that corporate association is composed of three dimensions: corporate innovation, integrity, and social responsibility. Additionally, from the perspective of store retailers, it was proposed that compared to manufacturers, retailers' corporate associations included: store image, manufactured brand associations, and retailer's own brand associations. Aaker et al. (2010) applied the stereotype content model, suggesting corporate association could be divided into competence association and warmth association. This paper follows the research method of Aaker et al. (2010), categorizing corporate association into competence association and warmth association. The following text reviews the literature related to competence association and warmth association.

Corporate association, as consumers' cognitive collection of all information about a company, has attracted academic interest, with sufficient exploration into their influencing factors and effects (Akbari et al., 2021; Beji et al., 2021). Influencing factors of corporate association are broad, and roughly divided into two categories: corporate behavior and employee behavior, including charitable donations and other CSR activities, marketing behavior, and management measures. Xiong (2023) found in a study on hotel charitable donations that compared to those that did not donate, hotels participating in charitable donations could trigger more positive brand attitudes among consumers, with event warmth and corporate warmth associations playing a full chain mediating role. Grazzini et al. (2021) discovered in the fashion industry that corporate actions, such as using environmentally friendly materials, could increase consumers' level of warmth associations, thereby affecting their purchasing intentions for fast fashion products. Regarding corporate advertising design, it was found that highlighting warmth in advertisements for functional

products reduces consumers' corporate competence association, leading to a decreased perceived quality of the product and reducing their purchasing behavior (Kim & Ball, 2021). Existing research has confirmed that the symbolic moral attributes and functional moral attributes of corporate social innovation products can enhance consumers' warmth associations (Fan et al., 2024). Lee et al. (2023), focusing on the government, found that the sense of security of government online websites, website transparency, and appropriateness of information could affect citizens' warmth associations, while website service quality affects ability associations. Employee behavior, such as type and performance, also impacts corporate associations. Min & Hu (2022) discovered in the service industry that the degree of service personnel's smiles could affect consumers' ability and warmth associations. Compared to a slight smile, a noticeable smile by service personnel can increase consumers' judgments of their capability and warmth, thereby enhancing their purchasing intentions. Service personnel's appearance also affects capability and warmth associations. Li et al. (2021) found that the attractiveness of tourism service providers could reduce the social distance between tourists and service providers, thereby improving tourists' stereotypes of warmth and capability towards service providers. With the advent of new technologies, robots have been incorporated into corporate operations, and research has found that the level of anthropomorphism of robots affects consumer associations.

In terms of the effects of corporate association, it can influence consumer attitudes, purchase intentions, and pro-environmental behaviors. Both competence and warmth association can have a positive impact on consumer attitudes. For instance, Hong & Sun (2012) found that associating romantic love

movies with warmth increases liking and purchase intention for the movies. Warmth feelings can also enhance consumers' willingness to purchase corporate social innovation products (Fan et al., 2024). Wang (2022) discovered that pro-social suggestions positively affect likability and perceived capability within organizations, subsequently influencing managers' likelihood to adopt suggestions and recommend employee promotions and salary increases. Moreover, studies have confirmed that individual pro-environmental behavior can be motivated and driven by warmth associations (Giebelhausen et al., 2016; Hartmann et al., 2017). For example, research by Andrews et al. (2014) and Müller et al. (2014) found that warmth association enhances customers' willingness to purchase cause-related marketing products. Hartmann & Apaolaza-Ibáñez (2012) suggested that warmth association could boost consumers' willingness to purchase green products. Sheng et al. (2019) corroborated this viewpoint in their study on post-purchase green marketing by companies, finding that warmth association can encourage consumers to engage in continuous green consumption behaviors, such as repurchasing green products. Studies by Habel et al. (2016) and Ahn & Lee (2020) found that warm feelings enhance customers' willingness to participate in corporate social responsibility activities.

2.6 Purchase Intention

The concept of 'intention' originally emerged in the field of psychology to describe the likelihood of a behavior occurring, and was later introduced into marketing as Consumers' Purchase Intention (Zhang, 2023). It is often used as a proxy for actual consumer buying behavior in studies. Various scholars define purchase intention differently: Dodds et al. (1991) viewed it from a probability

perspective, defining it as the likelihood of consumers purchasing a product/service; Eagly & Chaiken (1993) considered it a motive, defining it as the effort consumers were willing to exert to achieve a purchase; Mullet & Karson (1985) categorized purchase intention under the realm of attitude; Ajzen & Fisbbein (1974) saw it as a type of behavioral inclination, suggesting that purchase intention was a tendency to act based on beliefs in a particular context, reflecting future actions; while Zeithaml et al. (1988) believed that purchase intention had both positive and negative aspects. When consumers were satisfied with or like the products or services offered by a company, they possessed a positive purchase intention and were likely to make an actual purchase. Conversely, when consumers disliked or were dissatisfied with the products or services, their purchase intention was negative, and the likelihood of making a purchase was smaller. This research adopted Dodds et al. (1991) definition, considering consumers' purchase intention as the likelihood of purchasing a company's product/service after viewing the company's products or experiencing its services

In retail service research, consumers' purchase intention is often used as the dependent variable. This research categorizes factors affecting consumers' purchase intention in the retail service industry into three groups: service characteristics, product characteristics, and other elements. Service characteristics include service quality, service personnel, and service environment, among others. Research has identified service quality as a key success factor for retailers and service providers. As early as 1994, Taylor & Baker (1994) highlighted service quality as a critical factor in the formation of consumer purchase intention within service environments. Chen et al. (2019)

further supported this view, finding that in China's new energy vehicle market, most consumers' lack of knowledge about new energy vehicles makes them more susceptible to the influence of services provided by retailers, with service quality significantly positively affecting consumers' purchase intentions towards new energy vehicles. Jain et al. (2021), in their study on logistics services, confirmed that logistics service quality, including product availability, timeliness of arrival, and transportation conditions, positively promotes consumers' repurchase intentions. Service personnel are also the key to promoting consumer purchase behavior in the retail service industry. Studies have confirmed that the type of service personnel (Ha et al., 2014), appearance (Li et al., 2021), persuasion style (Li et al., 2023), authenticity traits (Matthews et al., 2020), and other factors will have an impact on consumers ' purchase intention. Shao et al. (2004) found that providing appropriate attire for service personnel in the service industry can raise consumers' expectations of service quality and enhance their purchase intention. Peng, et al. (2021) discovered in the context of shared accommodations that overly attractive and ordinary-looking host profiles reduce consumers' booking intentions, while moderately attractive host profiles lead to more booking actions. Furthermore, service environments such as background music, scent, lighting, and crowding levels also impact consumers' purchasing decisions (Dang et al., 2021; Errajaa et al., 2021; Gupta & Coskun, 2021; Pantoja & Borges, 2021).

Regarding products, they are the core purpose of consumer purchasing behavior; thus, product characteristics influence purchasing actions (Guo, 2020). Product characteristics include external cues and internal attributes. External cues include product color, price, packaging, origin, layout, etc. (Chang & Wildt,

1994; Chen et al., 2020; Marques et al., 2019). When unable to obtain specific product information, external cues become crucial for consumer purchasing evaluations. For example, Sevilla & Townsend (2016) explored the impact of product display space on consumer perceptions in retail settings, finding that compared to cramped display spaces, spacious product display areas can provide consumers with a greater sense of aesthetics, thus affecting total product sales. Rybak et al. (2021) found that food processing claims and nutritional information on food packaging can impact consumers' health perceptions and positively influence their purchase intentions. Internal cues, such as the appearance, ingredients, and type of products, often remain unaltered externally. Research by Miao et al. (2020) in the context of advertising has indicated that pairing close-up series advertisements with functional products and distant series advertisements with hedonic products can more effectively evoke consumer purchase intention. Zhu et al. (2020) found that product appearance novelty impacts consumer purchase intentions, with consumers more inclined to buy functional products with low appearance novelty and hedonic products with high appearance novelty. Wang et al. (2023) discovered that positive emojis in product advertisements can positively affect consumer purchase intention, especially when used in advertisements for hedonic products compared to functional products.

Beyond service and product characteristics, other factors such as consumer environmental consciousness, consumer purchasing experience, platform purchasing policies, and retailer advertising can affect consumer purchase intention (Costa et al., 2021; Shao et al., 2021). For environmentally conscious consumers, they are more inclined to buy green products (Costa et al., 2021).

For advertisements of tourist destinations endorsed by celebrities from the host country, tourists show higher emotional arousal and visit intention for advertisements using celebrities from their source country (Liu et al., 2023). Using attractive human model images in advertisements can reduce the level of self-threat experienced by consumers when viewing the advertisement, thereby enhancing advertisement effectiveness and increasing consumer purchase intention (Trinh, 2024).

This literature review on consumer purchase intention in the retail service sector shows that the concepts and factors influencing consumer purchase intention have been thoroughly explored in academia, providing theoretical support for the development of the research model in this paper.

Chapter 3 Theoretical Hypotheses

Based on the existing research deficiencies and research implications obtained from the literature review, this chapter will mainly focus on the theoretical development of the research model.

3.1 VR-based Service Innovation and Corporate Associations

VR technology is an emerging technology in the service industry with powerful capabilities. Based on existing research and information, VR technology is known for three notable advantages: immersion, interactivity, and imagination (Hudson et al., 2019). VR technology can carry out environmental simulation. The simulated environment is very real, making it difficult for users to distinguish between true and false, which is called immersion. For instance, VR-based test-driving services can give customers a genuine feeling of being in the actual driving position of a car. VR technology allows users to manipulate entities in a virtual environment and receive feedback similar to real-life experiences. In VR test driving services, users can virtually test drive, controlling the steering wheel to manage the speed and direction of the virtual car and experiencing different viewpoints. Furthermore, VR technology also enables users to construct and imagine, breaking through the limits of time and space to accomplish tasks that cannot be done in reality. The powerful functions of VR technology are well-recognized and stored in the brain as nodes.

In the service industry, utilizing VR technology to provide consumers with innovative services can enhance consumers' association with corporate competence. On the one hand, as previously mentioned, VR technology itself possesses powerful capabilities and is user-friendly. For consumers, this

technology symbolizes capability. Existing research has shown that the use of emerging technology can bring about associations related to capability in consumers (Liu et al., 2022). Competence association is a functional dimension linked with words like competent, skilled, reliable, intellectual, and efficacious (Fiske et al., 2007). Liu et al. (2022) noted that emerging technologies, such as robots, were initially designed to achieve practical goals, hence capability is considered an inherent and related attribute of such technologies (Kim et al., 2019). Yogeeswaran et al. (2016) also stated that robots were machines designed and programmed to achieve instrumental and practical goals. Therefore, it can be inferred that as an emerging technology, VR technology was developed for practical purposes, requiring significant investment of human, material, and financial resources, and has demonstrated powerful functionality in practical applications. Consequently, for consumers, VR technology is already linked with capability. For enterprises providing VR technology services to consumers, consumers' perceptions of VR technology are likely to be transferred to the enterprise, enhancing their association with corporate competence.

Moreover, service innovation itself is a manifestation of corporate ability. By definition, service innovation refers to new service products/processes developed or used by enterprises that can improve consumer experience and bring benefits to the enterprise (Hipp et al., 2000; Thakur & Hale, 2013). Therefore, service innovation requires enterprises to invest resources, such as human, financial, and effort (Lamey et al., 2021; Van et al., 2004). To consumers, enterprises that provide innovative services, especially those that purchase/use emerging technologies, usually possess certain strengths or market positions, indicating "capability". Thus, when faced with enterprises innovating their

services, consumers are likely to enhance their association with corporate competence, perceiving the enterprise as reliable, capable, and competent. Based on the above, it can be speculated that service innovation based on VR technology can stimulate and enhance consumers' association with corporate ability. Hence, the hypothesis is proposed.

H1: VR-based service innovation is positively related to corporate competence association.

Warmth is a universal dimension of human perception, often used to evaluate individuals/groups/brands/companies (Aaker et al., 2010; Fiske et al., 2002; Jiang et al., 2016). It is an emotional dimension, typically associated with trust, enthusiasm, friendliness, and generosity. According to the Stereotype Content Model (SCM), in social perception, judgments of warmth usually precede other judgments and can significantly influence consumers' emotions and behaviors (Fiske et al., 2007). Research has explored the factors influencing warmth association, identifying three main sources: anthropomorphic features, social interactions, and emotional resonance. Anthropomorphic features refer to new technologies/machines/brands possessing human-like characteristics, such as smiling, anthropomorphic bodies, arms or hand movements, and voice intonations (Lin & Lin, 2017), affecting warmth association (Kim et al., 2019). For instance, robots designed with certain human features make consumers judge them warmly. Compared to non-anthropomorphic robots, anthropomorphic robots are considered warmer (Choi et al., 2021). Song et al. (2021) showed that robots with child-like features (large forehead, round eyes, short chin) are perceived as friendlier and warmer by consumers. Bastian et al. (2012) highlighted that robots designed with gesture capabilities, such as

waving or shaking hands, increase perceived warmth. Zhu & Chang (2020) found that robot chefs with humanoid hands are considered warmer and produce better quality food. Moreover, robot voice affects consumers' warmth perception; anthropomorphized voices make consumers feel warmer, thus affecting their liking for the robot (Hoffmann et al., 2020). Lu et al. (2021) confirmed this in the catering service field. Commonly used interpersonal language content like "hello" and "thank you" also serve as cues for warmth perception (Söderlund, 2021). However, the use of existing VR technology relies on cold mechanical carriers. Despite the evolution from bulky desktop computers to portable laptops, mobile phones, and wearable devices (Tom et al., 2016; Tussyadiah et al., 2018), becoming smaller, more portable, more user-friendly, and more comfortable (Flavián et al., 2019b), VR technology is limited in anthropomorphism, making it difficult for consumers to judge it warmly.

Social interaction and emotional resonance are two other factors influencing warmth judgments. Social interaction refers to the mutual communication between social entities based on information dissemination to meet various needs (Feng et al., 2021); emotional resonance is an individual's empathic response to the emotional state of others (Lu et al., 2022). In the literature on service marketing, research has confirmed that consumer interactions with frontline employees can affect consumers' perceptions (Pinto et al., 2020). Lou et al. (2022) found that compared to intelligent employees, traditional service employees tend to adopt an imperfect and humane communication style during interactions with consumers. In this mode, service employees showcase their personal efforts and professional skills, allowing consumers to feel that the employees have tried their best to help solve problems,

leading to more positive and warm evaluations. Pino et al. (2020) also noted that customer-service employee contact is a primary source of customer warmth perception because service employees can integrate human uniqueness into social interactions with customers, such as compassion, attentiveness, friendliness, and understanding (Wong & Yang, 2020), helping to meet customers' service demands for friendliness, care, empathy, and understanding (Wang et al., 2021), making customers perceive warmth.

Therefore, in the retail service field, traditional human services can provide more contact and interaction. Traditional service employees need to listen to consumers' opinions, understand their needs, and respond promptly with solutions. In contrast, the use of VR technology reduces such interactions and contacts. Moreover, compared to traditional human services, VR technology cannot provide or convey warmth and friendliness to consumers, making it difficult to engage in positive emotional exchanges with consumers, making it hard for consumers to perceive the company warmly. Based on the above, it can be speculated that VR-based service innovation can decrease consumers' warmth association with the corporation. Thus, a hypothesis is proposed.

H2: VR-based service innovation is negatively related to corporate warmth association.

3.2 The Mediating Role of Corporate Association

Brand equity is an intangible asset and a competitive advantage for differentiation (Lang et al., 2022; Oh et al., 2020). Yoo & Donthu (2001), building on the work of Keller (1993) and others, define brand equity as the differential response of consumers to brand and non-brand products that are identical in terms of product attributes and marketing measures. This paper

adopts the definition from Yoo & Donthu.

According to the Customer-Based Brand Equity (CBBE) model, the core of brand equity is differentiated brand knowledge based on brand associations, including associations related to professional capabilities and social attributes (Berens et al., 2005; Brown & Dacin, 1997). Corporate associations are strategic assets for a company (Hou & Xue, 2014). Research has proven that corporate associations, especially competence associations, can influence brand equity. Brown & Dacin (1997) found that corporate competence associations help consumers make favorable assessments of a company's product quality. Chattopadhyay et al. (2010) further discovered that consumers' competence association with a company acts as a quality signal and is positively related to brand equity. This is because competence association makes consumers believe that the company is competent or of a certain scale, hence its products are quality assured, enhancing consumers' perceived quality of the brand, and leading to purchase decisions. Wang et al. (2006) noted that Chinese consumers have a unique cognitive pattern in consumption, i.e., top-down, from company to product brand. In markets lacking transparency and information symmetry, consumers prefer to connect with companies that are large in market size, strong in R&D capabilities, and have a good reputation. Hence, consumers tend to use their overall impression of a company as a critical basis for judging specific product features. Hou & Xue (2014) showed through structural equation modeling that consumers' perceptions of corporate competence positively influence their perceptions of product quality. In the field of retail services, the factors that consumers consider when making purchase decisions and the focus of attention are mainly the functionality of corporate products and services

(Barreto & Ramalho, 2019; Previte et al., 2019; Wu et al., 2018). Therefore, corporate competence association enhances consumers' perceptions of brand product quality, thereby improving a company's brand equity. Based on this, a hypothesis is proposed.

H3a: Brand equity is positively related to corporate competence association. VR-based Service innovation enhances brand equity by increasing the corporate competence association.

According to the research of stereotype content model in the brand field, it is found that there is a golden quadrant for consumers' cognition and emotion of the brand, that is, when the two dimensions of competence association and warmth association are at a high level, consumers will have positive emotions towards the brand, and thus produce positive brand attitude and purchase intention. Therefore, warmth association also has an impact on brand equity. Existing studies have demonstrated a positive relationship between warmth association and brand equity (Astvansh et al., 2024; Zhou et al., 2022). Research by Grandey et al. (2005) on service experiences shows that warmth association can influence expected satisfaction from service experiences, thus affecting brand equity. Aaker et al. (2010) indicated that warmth association with competent service can enhance consumers' satisfaction. Min & Hu (2022) found in the service industry that the degree of a service employee's smile can affect consumers' warmth association. Compared to a slight smile, a noticeable smile from service personnel can increase consumers' warmth judgments, positively impacting their cognition and attitudes towards the company and strengthening their purchase intention. Thus, warmth association can positively influence brand equity. As mentioned earlier, the use of VR technology reduces consumer

interaction and contact with service personnel, and the technology itself does not provide or convey warmth and friendliness to consumers, making it difficult to engage with them in a positive emotional way. VR-based service innovation can reduce consumers' corporate warmth association. Because warmth association is positively correlated with brand equity, VR-based service innovation will further weaken brand equity by reducing warmth association. Based on this, a hypothesis is proposed.

H3b: Brand equity is positively related to corporate warmth association. VR-based Service innovation weakens brand equity by reducing the corporate warmth association.

3.3 The Chain Intermediary between Corporate Association and Brand Equity

First, VR-based service innovation can enhance consumers' purchase intention. Existing research has verified the effectiveness of VR technology in shaping consumer attitudes and behaviors (Flavián et al., 2019a; Hudson et al., 2019; Tussyadiah et al., 2018; Willems et al., 2019). For example, in the marketing of tourist destinations, the use of VR technology can increase tourists' affection and preference for a destination by enhancing their sense of presence, leading to positive attitudes towards the destination, thus bringing a higher level of willingness to visit tourist destinations (Tostada et al., 2018). McLean & Barhorst (2022) found in their study on online hotel booking that, compared to static image website technology, 360°VR tours can enhance consumers' intention to visit a hotel before purchase and their intention to revisit after purchase. Yang et al. (2023), in their study on Virtual Fitting Rooms (VFR), discovered that the use of emerging VFR technology in online shopping

scenarios can enhance the purchase intention of consumers with lower Body Mass Index (BMI) levels.

Second, the corporate competence association mediates the relationship between VR-based service innovation and purchase intention. The use of VR technology by companies to provide services enhances consumers' association with corporate competence. On the one hand, VR technology is an emerging technology with significant investment in research and development, powerful functionality, practicality, and convenience. Competence is an inherent and related attribute of such technology (Hudson et al., 2019; Kim et al., 2019; Liu et al., 2022). For consumers, VR technology is already linked with competence. On the other hand, service innovation itself requires companies to expend certain costs, such as manpower, financial resources, and energy, which is a manifestation of the company's competence. Therefore, when facing companies that provide innovative services using VR technology, consumers will strengthen their corporate competence association, considering the company to be reliable, competent, and capable. Corporate competence association can enhance consumers' willingness to purchase. Research by Aaker et al. (2010) found that compared to non-profit organizations, consumers perceive for-profit organizations as more capable and are more willing to purchase their products. Further research by Brown & Dacin (1997) and Chattopadhyay et al. (2010), suggests that corporate competence association can serve as a quality signal, enhancing consumers' perception of product quality, thereby influencing consumers' purchase decisions and increasing their willingness to buy the company's products (Liu & Zhao, 2021; Gao, 2019). Therefore, VR-based service innovation can enhance consumers' corporate competence association,

thereby increasing their purchase intention.

Furthermore, brand equity mediates between corporate competence association and purchase intention. As previously mentioned, brand equity comprises brand awareness, brand loyalty, and perceived quality dimensions. Existing research has shown that corporate competence association can impact the perceived quality and brand awareness dimensions of brand equity (Brown & Dacin, 1997; Chattopadhyay et al., 2010), thereby enhancing purchase intention. Pappu et al. (2005) suggest that corporate competence association can strengthen consumers' trust in a brand, and increase brand recognition and understanding, contributing to the improvement of brand equity. Research by Bigné-Alcañiz et al. (2012) and Yoon et al. (2006) found that companies perceived as capable typically produce high-quality products, thus competence association can enhance consumers' positive perceptions of a company. Empirical studies by (Hou & Xue, 2014) confirmed that consumers' perception of corporate competence positively affects their perceived quality of the brand, thereby enhancing brand equity and increasing consumers' purchase intentions (Liu & Zhao, 2021; Gao, 2019).

Based on this, a hypothesis is proposed.

H4a: The relationship between VR-based service innovation and purchase intention is chain mediated by corporate competence association and brand equity. That is, there is a positive relationship between brand equity and purchase intention, and the relationship between VR-based service innovation and purchase intention is chain mediated by corporate competence association and brand equity.

Corporate warmth association mediates the relationship between VR-

based service innovation and purchase intention. Warmth association can influence consumers' attitudes and behaviors, affecting their purchase decisions. Research by Habel et al. (2016) and Ahn & Lee (2020) found that warmth enhances customers' willingness to participate in corporate social responsibility activities. Hong & Sun (2012) discovered that associating romantic love movies with warmth increases the liking and purchase intention towards the movies. Warmth association can also enhance consumers' willingness to purchase corporate social innovation products (Fan et al., 2024). Additionally, research has confirmed that individual pro-environmental behaviors can be motivated and driven by warmth association (Giebelhausen et al., 2016; Hartmann et al., 2017). For example, studies by Andrews et al. (2014) and Müller et al. (2014) found that warmth association enhances customers' purchase intentions towards cause-related marketing products. Hartmann & Apaolaza-Ibáñez (2012) argued that warmth association can enhance consumers' willingness to buy green products. Sheng et al. (2019) in their research on post-purchase green marketing by companies, proved this point, finding that warmth associations can encourage consumers to engage in continuous green consumption behaviors, such as repurchasing green products. Therefore, warmth association is positively correlated with purchase intention. As mentioned above, VR-based service innovation will reduce consumers ' warmth association with enterprises, thus reducing their purchase intention.

brand equity mediates between corporate warmth association and purchase intention. Studies have shown that there is a positive relationship between warmth association and brand equity (Astvansh et al., 2024; Zhou et al., 2022). According to the stereotype content model (SCM), in social perception, warmth

judgment is usually made before other judgments and can affect consumers' attitudes and behaviors towards brands (Fiske et al., 2007). For example, Zhu & Chang (2020) found that in the catering scene, consumers have a higher perception of the warmth of robot chefs with humanoid hands, and believe that the quality of the food they make is better. Hoffmann et al. (2020) found that the voice of the robot will affect consumers ' perception of the warmth of the robot. Compared with the rigid mechanical voice, the anthropomorphic voice will make consumers feel warmer, which will affect their love for the robot and the brand. Brand equity is positively correlated with purchase intention (Holt, 2002; Oh, 2000). As mentioned above, compared with traditional manual services, VR-based service innovation cannot provide consumers with warm and friendly perceptions, and it is difficult to have positive emotional communication with consumers. It is also difficult for consumers to make warmth perception judgments on enterprises, which will reduce consumers' warm association with enterprises, thus weakening brand equity and reducing consumers ' purchase intention.

Based on this, a hypothesis is proposed.

H4b: The relationship between VR-based service innovation and purchase intention is chain mediated by corporate warmth association and brand equity. That is, there is a positive relationship between brand equity and purchase intention, and the relationship between VR-based service innovation and purchase intention is chain mediated by corporate warmth association and brand equity.

3.4 The Moderating Effect of Novelty Seeking

Novelty seeking, considered a personality trait of individuals (Raine et al.,

2002), is defined by Gocłowska et al. (2019) as the tendency of humans and animals to explore new and unfamiliar stimuli and environments. It's seen as a specific, lower-level behavioral tendency often associated with impulsiveness and adventurousness. Cloninger (1988) described it as an innate inclination to exhibit excitement and pleasure towards novel and rewarding stimuli, guiding individuals to seek potential rewards through frequent exploratory activities. Cloninger later viewed novelty seeking as a pathological personality deficit, noting that individuals with high novelty-seeking traits tend to be impulsive, underestimate risks, seek stimulation, and are prone to mood swings, potentially leading to self-harmful or socially harmful behaviors. Noël et al. (2011) further highlighted novelty seeking as reflecting an individual's curiosity and desire to explore. This research follows Gocłowska et al. (2019) ' s definition of novelty seeking.

Physiologically, novelty seeking is believed to affect the dopaminergic brain functions in humans, influencing behavior (Ebstein et al., 1996). Novel external stimuli can excite dopamine neurons and activate brain areas receiving dopaminergic input, serving as an intrinsic reward stimulus (De, 2013). In terms of research methods, the test and evaluation of novelty seeking were changed according to the experimental subjects. Methodologically, assessments of novelty seeking in humans often employ questionnaires, scales, or qualitative methods like data and case analyses (Drago et al., 2009; Fassino et al., 2010; García et al., 2012), while animal studies use experimental approaches like novel response tests and novelty preference experiments (Jiao et al., 2011; Tian et al., 2014). Current research mainly focuses on contextual environments, exploring the relationship between novelty seeking and addiction, antisocial

behavior, and excessive risk-taking (Wills et al., 1994). For example, studies have found a non-linear relationship between novelty seeking and addictive behaviors, with different trait levels of animals responding differently to various addictive drugs due to multifactorial influences (Mathews et al., 2010; Walker et al., 2009). Beyond physiological mechanisms, the impact of novelty-seeking traits on consumer behavior in real life warrants attention. Costa et al. (2014) argue from an evolutionary perspective that novelty-seeking traits can drive individual exploration behaviors. Gocłowska et al. (2019) further suggest that novelty seeking affects most individual decisions, such as trying novel foods, engaging in innovative entrepreneurship, breaking conventions, and forming alliances with external groups (Cohen et al., 2007). However, research on novelty seeking remains limited, and the positive effects of novelty-seeking traits on consumer purchase intention are yet to be explored. This paper aims to investigate this topic.

Previous studies have found individual differences in novelty-seeking traits, leading to varied behaviors (Jiao, 2011). Low-level novelty seekers tend to be calm, neutral, unenthusiastic, conservative, and orderly; in contrast, high-level novelty seekers are active, exploratory, strongly attracted to novelty and unfamiliar stimuli, and show excitement and pleasure towards them, more willing to explore and study new things physically and behaviorally (Gocłowska et al., 2019). Małecka et al. (2022) also noted in their study that individuals seeking new experiences often have a positive inclination towards purchasing new technologies or products.

Previous research indicates that consumers with high novelty-seeking traits have higher expectations regarding the capabilities, strength, and convenience

of technological products and new technologies. In contrast, consumers with lower novelty-seeking traits, being more conservative and orderly, have lower expectations for the capabilities and experience of technological products and new technologies. According to the theory of expectation difference, customers will have different degrees of pre-consumption expectations before using products or receiving services, and perceived quality will be formed after consumption/experience. The difference between pre-and post-experience affects customer satisfaction and perceptions and evaluations of the company. Therefore, when the experience brought by the application of VR-based service innovation is fixed, because consumers with high novelty seeking characteristics have higher expectations, for them, the promotion effect of service innovation on ability association will be lower. Since consumers with low novelty-seeking traits have lower expectations, the service innovation experience with VR technology can provide them with an unexpected experience, significantly enhancing their competence in association with the company. Thus, a consumer's novelty seeking can weaken the impact of service innovation on corporate competence association. Compared to consumers with higher novelty seeking, service innovation has a greater impact on consumers with lower novelty seeking. Based on this, the following hypothesis is proposed:

H5a: Novelty seeking moderates the relationship between service innovation and competence association such that higher novelty-seeking weakens the relationship.

The impact of novelty seeking on the relationship between service innovation and warmth association follows a similar pattern. When it comes to technological products and new technologies, consumers with high novelty-

seeking traits, focus more on the capabilities inherent in the technology itself, placing less importance on additional service skills such as thoughtful reminders and personalized care. Thus, consumers with high novelty-seeking traits have lower expectations for warmth. In contrast, consumers with lower novelty-seeking traits, being more conservative and accustomed to traditional human services, place greater importance on additional service skills such as thoughtful reminders and personalized care. According to expectation discrepancy theory, customers form different levels of pre-consumption expectations before using a product or receiving a service, and post-consumption/perception quality forms after the experience. The difference between pre-and post-experience affects customer satisfaction and perceptions and evaluations of the company. Therefore, when the experience brought by the application of VR-based service innovation is fixed, because consumers with high novelty seeking traits have lower warmth expectations, for them, the weakening effect of service innovation on warmth association will be lower. For consumers with low novelty-seeking traits, the service innovation experience with VR technology reduces their interaction and contact with employees, failing to meet their needs for friendliness, care, empathy, and understanding, thereby significantly weakening their warmth association with the company. Thus, consumers' novelty seeking traits can weaken the impact of service innovation on corporate warmth association. Compared to consumers with higher novelty seeking, service innovation has a greater impact on consumers with lower novelty seeking. Based on this, the following hypothesis is proposed:

H5b: Novelty seeking moderates the relationship between service innovation and warmth association such that higher novelty seeking weakens

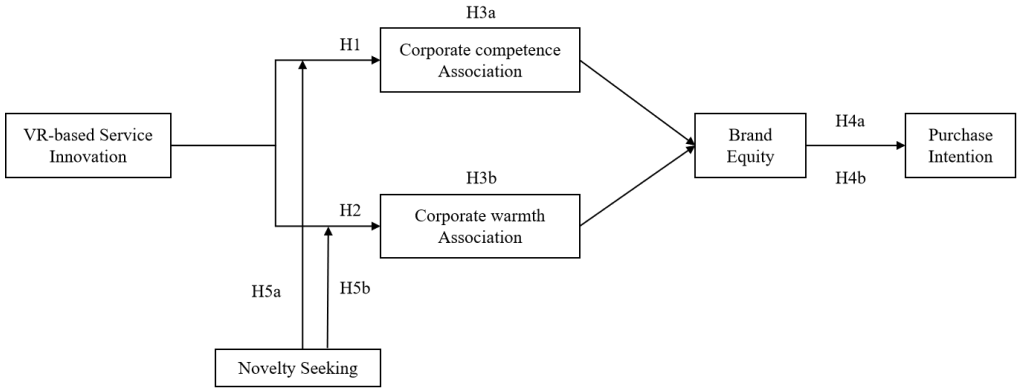
the relationship.

3.5 Research Model

As shown in Figure 3-1, this research mainly explores the main effect and internal mechanism of VR-based service innovation and its effect difference under different novelty seeking trait levels. In this regard, this research constructs an effect path of " VR-based service innovation → corporate association → brand equity → purchase intention ", and assumes that under different levels of novelty seeking characteristics, the impact of VR-based service innovation on corporate association will change. Specifically, novelty seeking moderates the relationship between service innovation and competence association such that higher novelty-seeking weakens the relationship. And, novelty seeking moderates the relationship between service innovation and warmth association such that higher novelty seeking weakens the relationship.

Figure 3.1

Research model



3.6 Overview of Studies

Two studies were used to explore the impact of VR-based service innovation. Study 1 employed a field experiment method, designing an experimental group with VR-based service innovation and a control group

without VR-based service innovation, to test the hypotheses H1, H2, H3a, H3b, H4a, H4b in real consumer contexts. The results indicated VR-based service innovation was positively related to corporate competence association. VR-based service innovation could enhance consumers' corporate competence association, thereby strengthening brand equity and consequently improving consumers' purchase intention. Study 2 used a questionnaire survey method to test the all proposed hypotheses. Study 2 repeatedly examined the effect of service innovation found in study 1, and further tested the moderating effect of novelty seeking. The results showed that service innovation was positively related to corporate competence association. Service innovation could enhance consumers' corporate competence association, thereby strengthening brand equity and consequently improving consumers' purchase intention. And novelty seeking moderated the relationship between service innovation and competence association such that higher novelty-seeking weakens the relationship.

Chapter 4 A Field Experimental Study of VR-based Service Innovation

The experimental method is that the researchers control or manipulate the independent variables, and then the subjects are randomly assigned to the experimental groups representing different degrees of independent variables to observe the influence of this manipulation on the variation of dependent variables. By controlling various situational factors, researchers can clearly observe the hypothesized causal relationships, ensuring the reliability of the study's conclusions. Experiments are categorized into laboratory and field experiments. Field experiments, conducted in real-life settings, can more accurately reflect consumer behavior in daily life, offering high external validity and credibility. Based on this, the thesis first uses a field experiment method to examine the impact of VR-based service innovation on corporate brand equity and consumer purchase intention.

4.1 Experiment Designs

The primary aim of this study is to examine the impact of VR-based service innovation on corporate competence association (H1) and warmth association (H2), as well as the chain mediating role of corporate associations and brand equity (H3a, H3b, H4a, H4b). Accordingly, the thesis designed a two-level (VR-based service innovation vs. control group) single-factor between-group field experiment, conducted at two Automobile Sales Service Shop 4S store of Pengfeng company. These two 4S stores are both high-end automobile retail outlets, covering a wide area and both selling Audi and other brands of cars. In addition, these two 4S stores have been operating for more than 20 years, and

there have been a large number of repeat customers. These two stores share similar store size, automobile brands sold, and target consumer demographics.

4.1.1 Enterprise Introduction

Founded in 1993, Pengfeng company is a comprehensive automotive enterprise group offering a full range of services including car sales, registration, insurance, maintenance, annual inspections, claims processing, rescue operations, and the development and sales of auto accessories. It stands as the sole provider of a complete automotive service industry chain in Shenzhen. In April 1999, Pengfeng set an industry benchmark by establishing Shenzhen's first Automobile Sales Service Shop 4S store—Guangqi Honda Pengfeng Store. Over the years, Pengfeng has represented numerous automotive brands such as Mercedes-Benz, Audi from FAW-Volkswagen, Jaguar Land Rover, GAC Honda, GAC Toyota, FAW Toyota, Dongfeng Honda, and BYD, becoming Shenzhen's first approved pilot unit for parallel-import cars, certified by the National Ministry of Commerce and approved by the Shenzhen city government. For nearly three decades, through continuous innovation in management philosophy and building brand reputation through word of mouth, Pengfeng has earned the accolade "To see China's car market, look to Shenzhen; to see Shenzhen's car market, look to Pengfeng." Pengfeng has diligently operated its business and steadily grown while never forgetting to give back to society, fulfilling its corporate duties and responsibilities with cumulative donations to public welfare activities exceeding one hundred million yuan.

Throughout its years of steady development, Pengfeng has established a trusted brand reputation, accumulated extensive management experience and industry resources, and more importantly, cultivated a team of professional

talents in the automotive service field. The industry talents trained by Pengfeng have driven the development of the industry in Guangdong and even the entire South China region. It can be said that Pengfeng is the "Whampoa Military Academy" of the automotive service industry in South China.

Although Pengfeng has focused on creating its own brand reputation during its branding process, it still lacks a profound impression and understanding among consumers. This is also the problem encountered by China's automobile service enterprises in the process of branding, that is, how to enhance consumer recognition, understanding, and association with the brand, building trust and loyalty that ultimately translate into consumer purchase intention. This aligns with the focus of our study: exploring how to better build and shape corporate brand equity using existing technological means and methods, enhance consumer purchase intention, and promote the development of the enterprise's branding process.

4.1.2 Experimental Location

The Shenzhen Automobile Sales Service Shop 4S stores was selected to be the location of the field experiment for the following considerations: Firstly, strong controllability. The Shenzhen Automobile Sales Service Shop 4S stores are two high-end automobile sales outlets that the author owns, allowing to exert strict control over the experiment process. Secondly, the suitability of the case. Currently, only a few high-end automobile 4S stores have incorporated VR technology innovations into their sales process. The two 4S stores primarily selling brands like Audi, have already implemented VR technology, making them highly appropriate for conducting this study. There are many consumers who come to buy cars, and it is easy to obtain more real and reliable data.

4.1.3 Experimental Procedure

The experimental group and the control group were set up in this field experiment. Consumers in the experimental group received VR technology services while wearing VR glasses, while those in the control group received only traditional personnel services. The specific experimental steps were as follows: customers entered the store; then, salespeople greeted customers and tried to understand customer needs; subsequently, salespeople provided customers with either VR experience services or traditional services. Specifically, in the formal experiment, the participants were assigned to one of the conditions randomly. After determining the first participant by a random draw, the participants were alternately assigned to different groups in the below way: the first participant was assigned into the experiment group through a random draw; the second participant was assigned to control group; the third participant was assigned to experiment group and the fourth one was assigned to control group again, and so on. The participants assigned to the experiment group will receive VR technology services, while the participants assigned to the control group will receive traditional manual services. Participants assigned to the experimental group will be told about the use of VR glasses and the discomfort they might cause. If the customer does not agree to wear VR glasses, the customer is not included in the test, and the next customer continues to be assigned to the experimental group. After the participants were assigned to the experiment group, they would wear VR devices. The VR device was PICO 4 Pro, which was composed of VR glasses and vibration handle. After wearing the VR glasses, the participants carried the handle and went to the VR test site under the lead of the sales staff, that is, an empty area on the floor. Participants

would see a car parked in front through the VR device, and they could change the color of the car by controlling the handle. Participants could also open the car's door in a virtual environment through the handle and view the internal conditions of the vehicle, such as the steering wheel, the instrument, etc. A total of 110 consumers participated in the experiment; finally, after receiving the promotion service, the participants were asked to fill out the questionnaire. Participants needed to tick the items of service innovation, corporate association, brand equity, purchase intention, etc., and fill in the basic personal information (such as gender, age, income, etc.) at the end of the questionnaire.

The person who filled in the questionnaire would receive a small gift worth 100 yuan. If the participant refuses to fill out the questionnaire, the sample is invalid, and the next customer continues to be assigned to the same group. Finally, 100 valid samples were obtained.

Figure 4.1

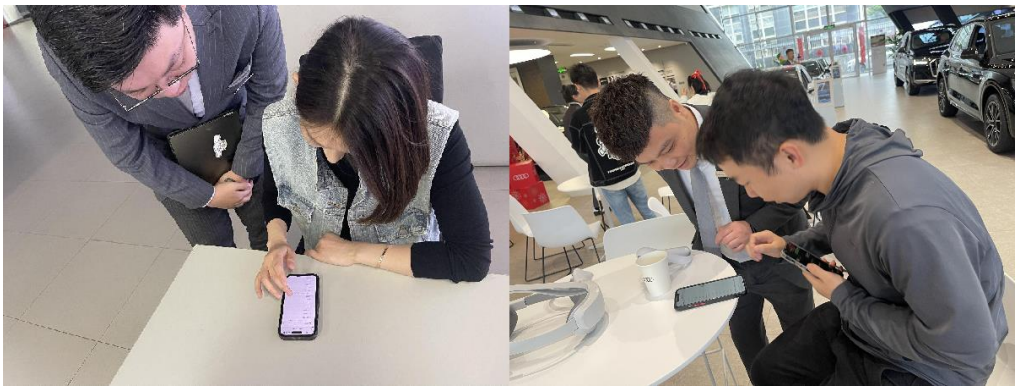
VR intervention

Figure 4.2

Experimental group of consumers served by VR technology

Figure 4.3

Consumers completing the questionnaires



4.2 Variable Measurement

In this study, service innovation refers to new service products/processes developed or utilized by enterprises, aimed at enhancing consumer experience and benefiting the enterprises. The measure for service innovation is derived from Thakur & Hale (2013), consisting of six items. Drawing from Aaker et al. (2010), corporate associations are conceptualized along two dimensions: competence association and warmth association. Competence association describes consumer evaluations of a company's competence, while warmth

association pertains to evaluations of the company's intentions/purposes, each measured by three items. For brand equity, this research adopts a scale developed by Yoo & Donthu (2001), consisting of ten measurement items. Purchase intention is defined as the likelihood of consumers purchasing a company's products/services after experiencing its VR technology services, measured by three items from Dodds et al. (1991). Additionally, considering individual characteristics (such as gender, and age) and factors like the brand, budget, and frequency might influence consumers' judgment, I set up the customer personal information section and three fill-in questions on "Which brand of car do you plan to buy?", "How many times have you bought a car in Pengfeng?", and "What is your budget for buying a car? (in ten thousand yuan)." These are measured and later used as control variables in the analysis.

Considering that the above original scales are in English and the experiment is to be used in a Chinese context, it is cross-cultural. Therefore, the Brislin back-translation method was used. First, the original English scales were translated into Chinese, and then back-translated into English by a Chinese marketing professor with lots of English publication experience; the original versions had no semantic errors compared to the back-translated versions, and therefore, the scales were used with confidence.

Table 4.1

Variable measurement and scale source of Study 1

Variable	Measurement Item	Cronbach's α
Service Innovation	1.The service is totally new to Pengfeng. 2.The service allows Pengfeng to enter a new market. 3.The service creates a new product line for Pengfeng. 4.The service is totally new to the market. 5.The service offers new features versus competitive products. 6.The service requires a change in the customer's buying behavior.	0.895
Corporate Competence Association	1.Pengfeng is competence. 2.Pengfeng is effective. 3.Pengfeng is efficient.	0.711
Corporate Warmth Association	1. Pengfeng is warm. 2. Pengfeng is kind. 3. Pengfeng is generous.	0.762
Purchase Intention	1.I am willing to buy a car in Pengfeng. 2.The likelihood that I buy a car in Pengfeng is very high. 3.I am likely to buy a car in Pengfeng in the future	0.710
Brand Equity	1.I consider myself to be loyal to Pengfeng. 2.I will not buy other brands if Pengfeng is available at the choice. 3.I can recognize Pengfeng among other competing brands. 4.I am aware of Pengfeng. 5.Some characteristics of Pengfeng come to my mind quickly. 6.I can quickly recall the symbol or logo of Pengfeng. 7.It makes sense to go to Pengfeng instead of any other brand, even if they are the same. 8.Even if another brand has the same features as Pengfeng, I would prefer to buy a car in Pengfeng. 9.If there is another brand as good as Pengfeng, I prefer to buy a car in Pengfeng. 10.If another brand is not different from Pengfeng in any way, it seems smarter to buy	0.817

The above scales were measured using the 7-point Likert scale. The operational definition of the variables and the source of the scale are shown in

Table 4-1. In the formal experiment, the Cronbach's α values of the reliability coefficient of each variable were all above 0.7, and the measurement model had a good fitting index, χ^2 =388.828， df = 259，χ^2 /df =1.501<3； TLI=0.846，CFI =0.867， RMSEA = 0.071， SRMR = 0.075. This shows the measurement of the variable is reliable in this study.

4.3 Pre-test

In order to test whether the manipulation of VR-based service innovation is successful and the effectiveness of the measurement, I conducted a pre-test study before the formal experiment. A total of 50 questionnaires were collected in the Mercedes-Benz 4S store. The participants were randomly involved in one of the groups: 25 people in experimental group with VR-based service innovation and 25 people in the control group without VR-based service innovation. Among them, there were 31 male samples (62 %) and 19 female samples (38 %); the majority of the samples were 41-50 years old, accounting for 46.0 %, followed by 31-40 years old, accounting for 42 %. I use independent samples T-test to test the manipulation of VR-based service innovation. The results show that : $M_{\text{control group}}$=2.79，SD=1.24; $M_{\text{experimental group}}$=5.65，SD=0.48，$t$=10.75，$p$<0.001. And the reliability coefficient of these six measurement items is 0.985, which is much higher than the minimum standard of 0.7, indicating the validity and reliability of the measurement of VR-based service innovation. The above results show that experimental group with VR-based service innovation and control group without VR-based service innovation can be clearly distinguished, which can illustrate the successful manipulation of VR-based service innovation.

4.4 Formal Experiment

4.4.1 Data collection

On March 9, 2024, a field experiment was conducted in two 4S sales stores at the same time. These two 4S stores are both high-end automobile retail outlets. These stores share similar store size, automobile brands sold, and target consumer demographics. A total of 110 sample data were collected. After deletion, 100 valid samples were selected, and the effective rate of the questionnaire was 90.9 %. The selection was based on three criteria: (1) response time; with data from respondents who completed the questionnaire too quickly being discarded; (2) an attention filter question, with data failing this test being removed; (3) verbal confirmation of being a car purchaser, but not for other reasons, such as enjoying the cool.. Within the valid samples, the experimental group with VR-based service innovation and the control group each comprised 50 individuals. As indicated in Table 4-2, the basic demographic information of the experiment participants included: 66 males and 34 females; the largest age group was 41-50 years, accounting for 50% of the sample, followed by 31-40 years at 41%; 56% of participants had a bachelor's degree; 43% were employed by private companies; 60% had a pre-tax monthly income of over 20,000 yuan. Regarding car purchasing experience, 58% had previous experience, with 40% having purchased a car 1-2 times. Lastly, over half of the participants had a car purchase budget of 300,000 to 500,000 yuan, accounting for 72%, with 22% having a budget of 510,000 yuan or more. Overall, the composition of the participants closely matched that of the typical 4S store consumer, ensuring good representativeness of the sample.

Table 4.2

Basic characteristics of formal experimental samples

Fundamental Characteristic	Category	Frequency	Per Cent
Gender	Male	66	66%
	Female	34	34%
Age	21-30	5	5%
	31-40	41	41%
	41-50	50	50%
	51-60	4	4%
Education	High School	7	7%
	Junior College	25	25%
	Bachelor's Degree	56	56%
	Master's Degree	12	12%
Occupation	State-Owned Enterprise Employee	5	5%
	Public Institution Employee	10	10%
	Civil Servant	1	1%
	Private Enterprise Employee	43	43%
	Foreign Enterprise Employee	15	15%
	Other	26	26%
Income	5001-7000	4	4%
	7001-10000	9	9%
	10001-20000	27	27%
	More than 20000	60	60%
Frequency	0	42	42%
	1-2	48	48%
	3 or more	10	10%
Budget (Unit: Yuan)	Less than 300000	6	6%
	300000-500000	72	72%
	510000-790000	8	8%
	800000 or more	14	14%

4.4.2 Result Analysis

Correlation coefficient analysis between variables. Analysis of correlation coefficients between variables was conducted using Pearson's correlation coefficient test to examine the interrelationships. As shown in Table 4-3, service innovation, corporate competence association, brand equity, and purchase

intention were all significantly correlated, $p<0.01$; however, there was no significant correlation between service innovation and corporate warmth association. As shown in Table 4-3, purchase intention is negatively related to purchase experience. Purchase experience is measured in this experiment by the number of times a consumer has purchased a car in Pengfeng. The more purchasing experience consumers have means that they have purchased more cars in Pengfeng, and the Shenzhen Pengfeng 4S store, mainly sells Audi and other brands, so consumers may already have these brands of cars at home, and may be more likely to want to try other car brands or other stores. Additionally, the data were subjected to the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity, with a KMO statistic of 0.787 > 0.6 and a Bartlett's test result of $p=0.000 < 0.01$, indicating the presence of correlations among the original variables and no significant differences in the degree of correlation between them.

The CFA analysis was used to compute the model fits of the five-construct full model and other potential combination models to confirm that all five variables are distinct. As shown in Table 4-4, the results show the five-construct full model exhibits a better fit than the potential combination models (all the $\chi^2/df > 3$). These results provided strong evidence that the five-construct full model should be used in this study.

Table 4.3

Statistics on correlation coefficients between variables

	SI	CA	WA	BE	PI	BN	PE	Budget	Sex	Age	Education	Income	M	S.D.
SI	0.90												1.5	0.50
CA	0.29**	0.71											5.56	0.69
WA	0.07	0.28**	0.76										5.28	0.85
BE	0.43**	0.52**	0.32**	0.82									5.67	0.65
PI	0.23**	0.46**	0.34**	0.55**	0.71								4.97	0.69
BN	-0.03	-0.07	0.02	-0.07	-0.03	-							2.01	1.11
PE	0.12	-0.04	-0.03	-0.09	-0.23*	-0.12	-						1.68	0.65
Budget	0.03	-0.08	-0.07	-0.22*	-0.19	-0.03	0.31*	-					2.30	0.78
Sex	-0.04	-0.10	-0.10	-0.16	-0.15	-0.18	0.36**	0.16	-				1.34	0.48
Age	0.08	0.08	0.04	0.02	0.04	-0.12	0.21*	0.37**	-0.19	-			3.53	0.69
Education	-0.01	-0.06	-0.16	-0.05	-0.03	-0.34**	0.15	0.17	0.01	0.23*	-		4.73	0.76
Income	0.04	-0.01	-0.12	-0.12	-0.05	0.23*	0.13	0.33**	-0.02	0.30**	0.17	-	5.43	0.82

Note. SI=Service Innovation；CA= Competence Association；WA=Warmth Association；BE=Brand Equity；PI=Purchase Intention；BN=Brand Name；PE=Purchase Experience, *p<0.05; **p<0.01, double tail test.

Table 4.4

CFA Model comparison for different model in Study 1

Fit indices	Confirmatory factor analysis										
	SI, CA, WA, BE, PI	SI+CA, WA， BE, PI	SI+WA， CA， BE, PI	SI+ BE, WA， CA，PI	SI+PI, BE, WA，CA	SI， CA+WA， BE,PI	SI, CA+BE, WA, PI	SI, CA+ PI , WA, BE	SI, CA, WA+BE, PI	SI, CA, WA+PI, BE	SI, WA, CA, BE+ PI
$\chi 2$	389	563	569	588	544	544	513	503	538	543	500
df	259	269	269	269	269	269	269	269	269	269	269
$\chi 2$ */df*	1.5	2.09	2.16	2.18	2.02	2.02	1.91	1.87	2.00	2.09	1.86
TLI	0.846	0.664	0.657	0.636	0.686	0.686	0.721	0.733	0.693	0.687	0.736
CFI	0.867	0.699	0.692	0.673	0.718	0.718	0.750	0.760	0.724	0.720	0.763
RMSEA	0.071	0.105	0.106	0.109	0.101	0.101	0.095	0.093	0.100	0.101	0.093
SRMR	0.075	0.117	0.114	0.105	0.116	0.100	0.088	0.098	0.092	0.101	0.085
χ^2/df	/	174/10＞3	180/10＞3	199/10＞3	155/10＞3	155/10＞3	124/10＞3	114/10＞3	149/10＞3	154/10＞3	111/10＞3

Scale reliability and validity analysis. This study primarily used Cronbach's α coefficient to assess the reliability of the measurement scales for each concept, as shown in Table 4-1, with all variables' Cronbach's α exceeding 0.7, indicating the measurement scales adopted in this study are relatively reliable. In terms of scale validity, validity includes content validity, convergent validity, and discriminant validity. In this study, all variable measurements were based on previously established scales, ensuring the content validity of the measurement scales. The assessment of convergent validity relied on the factor loadings of each measurement item on its corresponding factor, composite reliability (CR), and the average variance extracted (AVE) values. As indicated in Table 4-5, all measurement indicators significantly loaded on their respective concepts, $p<0.001$, with standardized factor loadings ranging from 0.460 to 0.880, all above 0.4. The CR values for each concept ranged from 0.716 to 0.898, all above 0.7. The AVE values for all concepts ranged from 0.317 to 0.600, all above 0.3. These results indicate that all concepts in this study possess good convergent validity.

Manipulation Check. In this study, two groups (the experimental group vs. the control group) were set up, and the independent variable, namely, the VR-based service innovation was manipulated. Specifically, the participants in the experimental group experienced VR service, and the participants in the control group experienced traditional personnel service. The VR-based service innovation scale was used to measure the level of independent variables. Independent samples T-test was used to test the manipulation of VR-based service innovation. The results showed that: $M_{\text{control group}} = 4.67$, SD = 1.20; $M_{\text{experimental group}} = 5.67$, SD = 0.73, $t = 5.014$, $p < 0.001$. This shows that the

manipulation of VR-based service innovation is successful.

Table 4.5

Conceptual reliability and convergent validity analysis results

Concept	Measure Index	Factor loading	*p*	CR	AVE
SI	SI1	0.738	0.000		
	SI2	0.880	0.000		
	SI3	0.814	0.000	0.898	0.600
	SI4	0.815	0.000		
	SI5	0.805	0.000		
	SI6	0.553	0.000		
CA	CA1	0.547	0.000		
	CA2	0.769	0.000	0.721	0.468
	CA3	0.716	0.000		
WA	WA1	0.763	0.000		
	WA2	0.779	0.000	0.776	0.537
	WA3	0.650	0.000		
PI	PI1	0.667	0.000		
	PI2	0.639	0.000	0.716	0.457
	PI3	0.720	0.000		
	BE1	0.525	0.000		
	BE2	0.586	0.000		
	BE3	0.580	0.000		
	BE4	0.554	0.000		
BE	BE5	0.564	0.000	0.821	0.317
	BE6	0.460	0.000		
	BE7	0.526	0.000		
	BE8	0.612	0.000		
	BE9	0.625	0.000		
	BE10	0.575	0.000		

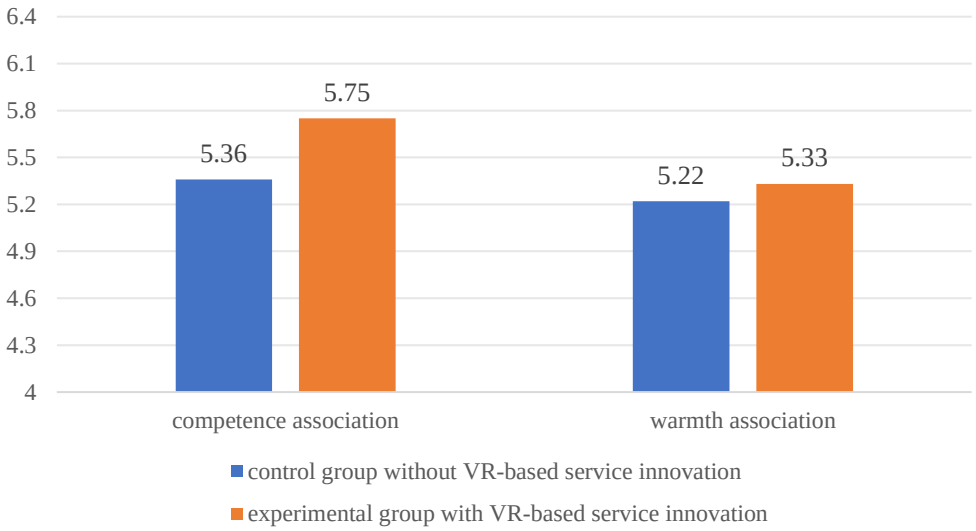
Note. SI=Service Innovation; CA= Competence Association; WA=Warmth Association; BE=Brand Equity; PI=Purchase Intention.

Main effect analysis. A one-way ANOVA was used to assess the impact of VR-based service innovation on corporate competence association and warmth association, with demographic information such as gender, age, and car purchasing experience serving as control variables. The analysis indicated a positive effect of VR-based service innovation on corporate competence

association, with $M_{\text{experimental group with VR-based service innovation}}=5.75$, $M_{\text{control group without VR-based service innovation}}=5.36$, $F\ (1,\ 98)\ =8.900$, $p<0.05$, supporting Hypothesis H1. Similarly, when analyzing warmth association, VR-based service innovation was found not to have a negative effect, with $M_{\text{experimental group with VR-based service innovation}}=5.33$, $M_{\text{control group without VR-based service innovation}}=5.22$, $F\ (1,\ 98) = 0.443$, $p=0.508>0.05$, thus Hypothesis H2 is not supported.

Figure 4.4

The analysis results of VR-based service innovation on corporate competence association and warmth association



Note. Control variables: income, education, frequency of purchase, budget, gender, age.

Mediation effect analysis. The Bootstrap method was employed to analyze the mediation effect, specifically utilizing the PROCESS plugin in SPSS, selecting Model 4, setting the confidence interval to 95%, and drawing 5000 samples for the analysis. The results indicate a significant mediating role of corporate competence association in the relationship between VR-based

service innovation and brand equity, with a confidence interval of [0.0113, 0.1306], not including 0. As shown in Table 4-6, the total effect value of VR-based service innovation on brand equity is 0.3369, the direct effect value is 0.2784, and the indirect effect value played by corporate competence association in it is 0.0585, thus corporate competence association is partially mediated. Hypothesis H3a is supported. Conversely, the mediating effect of corporate warmth association between VR-based service innovation and brand equity was not significant, with a confidence interval of [-0.0004, 0.0991], including 0. Hypothesis H3b is not supported.

Table 4.6

Mediation effect of corporate competence association

	Coefficient	BootSE	LLCI	ULCI	Relative Effect
Total Effect	0.3369	0.0533	0.2309	0.4428	
Direct Effect	0.2784	0.0527	0.1737	0.3831	82.6%
Indirect Effect	0.0585	0.0308	0.0113	0.1306	17.4%

Table 4.7

Mediation effect of corporate warmth association

	Coefficient	BootSE	LLCI	ULCI	Relative Effect
Total Effect	0.3369	0.0533	0.2309	0.4428	
Direct Effect	0.3044	0.0535	0.1981	0.4106	90.4%
Indirect Effect	0.0325(ns)	0.0259	-0.0004	0.0991	9.6%

Note. ns = not significant.

Chain mediating effect analysis. This involved using a sequential mediation effect analysis method with two mediating variables to test the chain mediating effect of corporate competence association and brand equity between VR-based service innovation and consumer purchase intention. Specifically, the

PROCESS program in SPSS 20.0 software was used, selecting Model 6, with variables such as demographic characteristics and car purchase experience as control variables, and setting the confidence interval to 95% with 5000 bootstrap samples for analysis. The data analysis results show that the sequential mediation effect from VR-based service innovation through corporate competence association and brand equity to consumer purchase intention is significant, with a confidence interval of [0.0011, 0.0428], not including 0, and a mediation effect value of 0.0140, supporting Hypothesis H4a.

The results of data analysis for the chain mediating effect test method of corporate warmth association and brand equity show that the sequential mediating effect of VR-based service innovation through corporate warmth association and brand equity to consumer purchase intention is not significant. The confidence interval [-0.0003, 0.0410] contains 0, assuming that H4b is not supported.

Table 4.8

Chain mediating effect of corporate competence association and brand equity

	Path	Coefficient	BootSE	LLCI	ULCI	Relative Effect
Total Effect	_	0.2581	0.0538	0.1512	0.3649	100%
Direct Effect	SI→PI	0.1180	0.0569	0.0049	0.2311	45.7%
Indirect Effect	SI→CA→PI	0.0596	0.0301	0.0133	0.1287	23.1%
	SI→BE→PI	0.0665	0.0358	0.0118	0.1527	25.8%
	SI→CA→BE→PI	0.0140	0.0110	0.0011	0.0428	5.4%
Total Indirect Effect	_	0.1401	0.0511	0.0595	0.2582	54.3%

Note. SI=Service Innovation; CA= Competence Association; BE=Brand Equity; PI=Purchase Intention.

Chapter 5 Structural Equation Model Analysis of Service Innovation

Building on the field experiment, Study 2 will be conducted to further enhance the external validity of the research and measure the impact of service innovation. This study will employ survey methods and construct a structural equation model to re-examine the effects of service innovation on corporate associations, brand equity, and consumer purchase intention. It will also test the chain mediating role of corporate associations and brand equity, as well as the moderating effect of novelty seeking.

5.1 Research Purpose

The primary aim of this study is to examine the effects of service innovation on corporate associations, brand equity, and consumer purchase intention, as well as the chain mediating role of corporate associations and brand equity, and the moderating role of novelty seeking on the relationship between service innovation and corporate associations. Although these hypotheses were tested in the field experiment of Chapter 4, the experiment had limitations, including a small sample size with only 50 participants per group. Therefore, Study 2 will utilize survey methods to re-examine the impact of service innovation on corporate associations, brand equity, and consumer purchase intention. It will also test the chain mediating role of corporate associations and brand equity and further explore the moderating role of novelty seeking on the relationship between service innovation and corporate associations.

5.2 Measurement

In Study 2, in addition to the increased novelty seeking, other variables were measured the same as in Study 1. Novelty seeking refers to the tendency of humans to explore novel and unfamiliar stimuli and environments. It is a specific lower-level behavioral tendency. The source of measurement items is Gocłowska et al. (2019), using a total of 11 items. The above scales were measured using the 7-point Likert scale. The operational definition of the variables and the source of the scale are shown in table 5.1.

Table 5.1

Variable measurement and scale source of Study 2

Variable	Definition	Measurement Item	Source
Novelty seeking	Novelty seeking is a tendency for humans and animals to explore novel and unfamiliar stimuli and environments. It is a specific lower-level behavioral tendency.	1.I usually seek out new opportunities or experiences. 2.I prefer change to routine. 3.I seek adventure. 4.I am always interested in finding new things to try. 5.I love to think up new ways of doing things. 6.I place a lot of importance on experiencing new things. 7.I like to begin new things. 8.I am open to change. 9.Trying new things is important for me to stay happy. 10.I enjoy hearing new ideas. 11.I like to visit new places.	Gocłowska et al. (2019)

5.3 Data Collection and Sample Overview

Study 2 was conducted offline in 4S stores. Compared to online data collection, the offline method offers several advantages: (1) it allows for immediate observation of participant reactions and behaviors, enabling real-

time feedback and timely questionnaire adjustments; (2) it yields authentic and credible consumer data. For this study, Pengfeng Automotive Sales Company's Shenzhen 4S shop was selected, and in-store salespersons were entrusted with distributing the questionnaires. Before distribution, the researcher provided a detailed manual and trained the salesperson on questionnaire distribution and potential issues that might arise. The questionnaire distribution process was as follows: first, customers entered the shop; then, the salesperson greeted them and assessed their needs; following that, services were provided based on customer needs; after service completion, the salesperson invited customers to fill out the questionnaire.

Questionnaires were filtered based on three criteria: (1) response time, with excessively short response times leading to questionnaire exclusion; (2) an attention check question, with failed responses leading to exclusion; (3) verbal confirmation of car purchasing, with non-purchaser responses excluded. Out of 400 distributed questionnaires, 50 were deemed invalid based on these criteria, resulting in 350 valid questionnaires and an 87.5% validity rate. As shown in Table 5-2, the participant demographic information was as follows: 205 males (58.6%) and 145 females (41.4%); the most represented age group was 31-40 years (45.4%), followed by 41-50 years (41.7%); 46.3% had a bachelor's degree; 41.1% were employees of private companies; over half (51.7%) had a pre-tax monthly income over 20,000 yuan, followed by 32.6% earning between 10,001 to 20,000 yuan; 74.0% had prior car purchasing experience. Lastly, the most common budget range for purchasing a car was 300,000 to 500,000 yuan (74.0%). Overall, the participant composition closely matched that of typical 4S shop consumers, ensuring good sample representativeness.

Table 5.2

Basic characteristics of study 2 samples

Fundamental Characteristic	Category	Frequency	Per Cent
Gender	Male	205	58.6%
	Female	145	41.4%
Age	21-30	26	7.4%
	31-40	159	45.4%
	41-50	146	41.7%
	51-60	19	5.4%
Education	Junior Middle School	2	0.6%
	High School	17	4.9%
	Junior College	109	31.1%
	Bachelor's Degree	162	46.3%
	Master's Degree	58	17.2%
	Doctor's Degree	2	0.6%
Occupation	State-Owned Enterprise Employee	32	9.1%
	Public Institution Employee	42	12%
	Civil Servant	8	2.3%
	Private Enterprise Employee	144	41.1%
	Foreign Enterprise Employee	51	14.6%
	Other	73	20.9%
Income	3001-5000	4	1.1%
	5001-7000	15	3.1%
	7001-10000	40	11.4%
	10001-20000	114	32.6%
	More than 20000	181	51.7%
Frequency	0	91	26.0%
	1-2	250	71.4%
	3 or more	9	2.6%
Budget (Unit: Yuan)	Less than 300000	34	9.7%
	300000-500000	259	74.0%
	510000-790000	42	12.0%
	800000 or more	15	4.3%

5.4 Measurement Model Analysis

5.4.1 Common Method Bias

Common method bias refers to the covariance between predictor and criterion variables that arises from the same data source, and measurement

context, among other factors, constituting a systematic error. This bias can be checked and controlled through procedural and statistical means (Zhou & Long, 2004). Given that the data in this study were collected through self-reports and constituted cross-sectional data, there might be a concern for common method bias. To address this, several procedural controls were implemented: (1) reminding participants that the survey is anonymous and solely for academic research before answering; (2) incorporating attention check questions within the questionnaire to ensure diligent responses. For example, a question is "what color is the water of Lake Urmia? please select the red option". Consumers who did not select the red option were considered not to have filled it out carefully; (3) including a few reverse-worded items to minimize potential common source errors. Furthermore, before conducting the formal data analysis, the common method bias was assessed. The Harman single-factor test was used, involving an exploratory factor analysis of all measurement items together and examining the unrotated factor solution. If the number of extracted factors is more than one and the largest factor explains less than 40% of the variance, it indicates no severe common method bias issue (Zhou & Long, 2004; Tang & Wen, 2020). Following this approach, the study's data underwent a common source error test. The factor analysis results revealed six factors, with the largest factor accounting for 39.957% of the variance, below 40%, suggesting that the study does not suffer from a severe common method bias issue.

5.4.2 Measurement Model Fit

According to the suggestion of Hair et al. (2011), it is necessary to analyze the fitting degree of the measurement model before the analysis of the structural model. The fitting effect of the overall model and data is better, χ^2 =1146.387,

df =579, χ^2/df =1.980<3; TLI=0.947, CFI =0.951, the above indicators are greater than 0.9; RMSEA = 0.053, SRMR = 0.052, the above indicators are less than 0.08.

5.4.3 Correlation Coefficient Analysis Between Variables

Analysis of correlation coefficients between variables was conducted using Pearson's correlation coefficient test. As shown in Table 5-3, service innovation, corporate association, brand equity, purchase intention, and novelty seeking were all significantly correlated, p<0.01；however, there was no significant correlation between service innovation and corporate warmth association. As shown in Table 5-3, brand name is negatively related to purchase intention and brand equity. Brand name is a control variable measured by the question "which brand of car do you plan to buy". For the brand name, it is assigned a value in the calculation for the purpose of analysis, therefore, its specific size is only used to differentiate between different brands and has no other significance. So, this correlation is meaningless. Additionally, the data were subjected to the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity, with a KMO statistic of 0.801 > 0.6 and a Bartlett's test result of p=0.000 < 0.01, indicating the presence of correlations among the original variables and no significant differences in the degree of correlation between them.

Table 5.3

Statistics on correlation coefficients between variables

	SI	CA	WA	BE	PI	NS	BN	PE	Bud	Sex	Age	Edu	Inc	M	S.D.
SI	0.91													5.19	1.15
CA	0.48**	0.80												5.62	0.86
WA	-0.00	0.18**	0.83											4.68	0.97
BE	0.63**	0.66**	0.13*	0.90										5.11	0.92
PI	0.52**	0.66**	0.15**	0.69**	0.81									5.63	0.85
NS	-0.18**	-0.16**	0.10	-0.16**	-0.12*	0.99								5.76	1.33
BN	0.00	-0.17**	-0.07	-0.13*	-0.14**	0.05	-							1.78	1.50
PE	-0.01	0.02	0.10	0.02	0.04	0.07	-0.10	-						1.77	0.48
Bud	0.00	-0.01	0.07	-0.01	-0.00	0.08	0.01	0.11*	-					2.11	0.61
Sex	0.05	0.03	-0.05	0.04	0.07	-0.16**	-0.01	-0.07	0.10	-				1.41	0.49
Age	-0.14**	-0.06	0.06	-0.07	-0.10	-0.01	0.14**	0.09	0.20**	-0.29**	-			3.45	0.71
Edu	0.07	0.02	0.05	-0.01	-0.04	0.02	-0.02	-0.01	0.23**	-0.05	-0.15*	-		4.75	0.83
Inc	0.03	-0.01	0.11*	0.03	-0.05	0.07	0.08	-0.09	0.40**	-0.05	0.21**	0.46**	-	5.30	0.88

Note. SI=Service Innovation; CA= Competence Association; WA=Warmth Association; BE=Brand Equity; PI=Purchase Intention; NS=Novelty Seeking; BN=Brand Name; PE=Purchase Experience; Bud=Budget; Edu=Education; Inc=Income; *p<0.05; **p<0.01, double tail test.

The CFA analysis was used to compute the model fits of the six-construct full model and other potential combination models to confirm that all six variables are distinct. As shown in Table 5-4, the results show the six-construct full model exhibits a better fit than the potential combination models (all the $\chi^2/df > 3$). These results provided strong evidence that the six-construct full model should be used in this study.

Table 5.4

CFA model comparison for different model in Study 2

Fit indices	Confirmatory factor analysis															
	SI, CA, WA, NS, BE, PI	SI+CA, WA, NS, BE, PI	SI+WA, CA, NS, BE, PI	SI+BE, CA, WA, NS, PI	SI+NS, CA, WA, BE, PI	SI+PI, CA, WA, BE, NS	SI, CA+WA, NS, BE, PI	SI, CA+BE, WA, NS, PI	SI, CA+NS, WA, BE, PI	SI, CA+PI, WA, BE, NS	SI, CA, WA+NS, BE, PI	SI, CA, WA+BE, NS, PI	SI, CA, WA+PI, NS, BE	SI, CA, WA, NS +BE, PI	SI, CA, WA, NS+PI, BE	SI, WA, CA, NS, BE+PI
χ^2	1146	1456	1544	1635	2384	1468	1515	1260	1666	1198	/	1528	1715	2747	1713	1242
df	579	584	584	584	584	584	584	584	584	584	/	584	584	584	584	584
χ2 /df	1.980	2.49	2.64	2.80	4.08	2.51	2.59	2.16	2.85	2.05	/	2.62	2.94	4.70	2.93	2.13
TLI	0.947	0.919	0.911	0.902	0.832	0.918	0.913	0.937	0.899	0.943	/	0.912	0.894	0.798	0.895	0.939
CFI	0.951	0.925	0.917	0.909	0.844	0.924	0.919	0.942	0.906	0.947	/	0.918	0.902	0.813	0.902	0.943
RMSEA	0.053	0.065	0.069	0.072	0.094	0.066	0.068	0.057	0.073	0.055	/	0.068	0.074	0.103	0.074	0.057
SRMR	0.052	0.072	0.073	0.061	0.163	0.071	0.071	0.052	0.127	0.052	/	0.070	0.131	0.204	0.133	0.052
χ^2/df	/	310/5＞3	398/5＞3	489/5＞3	1238/5＞3	322/5＞3	369/5＞3	114/5＞3	520/5＞3	52/5＞3	/	382/5＞3	569/5＞3	1601/5＞3	567/5＞3	96/5＞3

Note. The model "SI, CA, WA+NS, BE, PI" could not be recognized (The standard errors of the model parameter estimates could not be computed. The model may not be identified). Therefore, this model was not good.

5.4.4 Reliability and Validity Analysis of Scale

Similar to the above study, this study mainly evaluates the reliability of each concept measurement scale through the internal consistency coefficient Cronbach's α value. It can be seen from Table 5-5 that the Cronbach's α value of each concept is between 0.804-0.992, which is higher than 0.8, indicating that the measurement scale used in this study is reliable.

The validity of a scale primarily encompasses content validity, convergent validity, and discriminant validity. The evaluation of convergent validity relies on the factor loadings of each measurement item on its corresponding factor, composite reliability (CR), and the average variance extracted (AVE) values. As indicated in Table 5-4, all measurement indicators significantly load on their respective concepts, $p<0.001$, with standardized factor loadings ranging from 0.567 to 0.969, all above 0.5. The CR values for each concept lie between 0.806 and 0.992, all above 0.7. The AVE values for all concepts range from 0.483 to 0.915, all close to or above 0.5. These results indicate that all concepts in this study possess good convergent validity. When the AVE value of a concept is greater than the squared correlations with other concepts, it indicates that the concept has discriminant validity, distinguishing it from other concepts. As shown in Table 5-6, the AVE values of each concept are greater than their shared variances with other concepts. This demonstrates that all concepts within this study have discriminant validity.

Table 5.5

Conceptual reliability and convergent validity analysis results

	Factor loading		*p*	CR	AVE	Cronbach's *α*
SI	SI1	0.756	0.000	0.907	0.622	0.905
	SI2	0.836	0.000			
	SI3	0.842	0.000			
	SI4	0.832	0.000			
	SI5	0.831	0.000			
	SI6	0.606	0.000			
CA	CA1	0.723	0.000	0.806	0.580	0.804
	CA2	0.774	0.000			
	CA3	0.787	0.000			
WA	WA1	0.813	0.000	0.835	0.629	0.833
	WA2	0.845	0.000			
	WA3	0.716	0.000			
PI	PI1	0.775	0.000	0.815	0.595	0.814
	PI2	0.800	0.000			
	PI3	0.737	0.000			
BE	BE1	0.723	0.000	0.902	0.483	0.900
	BE2	0.674	0.000			
	BE3	0.567	0.000			
	BE4	0.719	0.000			
	BE5	0.607	0.000			
	BE6	0.611	0.000			
	BE7	0.699	0.000			
	BE8	0.791	0.000			
	BE9	0.775	0.000			
	BE10	0.745	0.000			
NS	NS1	0.953	0.000	0.992	0.915	0.992
	NS2	0.958	0.000			
	NS3	0.941	0.000			
	NS4	0.956	0.000			
	NS5	0.964	0.000			
	NS6	0.969	0.000			
	NS7	0.964	0.000			
	NS8	0.950	0.000			
	NS9	0.968	0.000			
	NS10	0.951	0.000			
	NS11	0.950	0.000			

Note. SI=Service Innovation; CA= Competence Association; WA=Warmth Association; BE=Brand Equity; PI=Purchase Intention; NS=Novelty Seeking.

Table 5.6

The analysis of the discriminant validity between concepts in Study 2

	SI	CA	WA	BE	PI	NS
SI	0.622	0.477**	-0.004	0.633**	0.515**	-0.181**
CA	0.228	0.580	0.178**	0.659**	0.659**	-0.155**
WA	0.000	0.032	0.629	0.132*	0.153**	0.103
BE	0.401	0.434	0.017	0.595	0.690**	-0.158**
PI	0.265	0.434	0.023	0.476	0.483	-0.116*
NS	0.033	0.024	0.011	0.025	0.013	0.915

Note. The diagonal line is the AVE, below the diagonal is the square of the correlation coefficient, and above the diagonal is the correlation coefficient.

5.5 Structural Model Analysis

5.5.1 SEM Model Fit

The thesis used AMOS software to analyze the structural equation model of the research model and test the relationship between the variables. Variables such as income, education, frequency of purchase, budget, gender, age, are control variables. The results of structural equation model analysis showed that: χ^2 =884.285, df = 270, χ^2 /df =3.275, GFI = 0.805, TLI=0.865, IFI=0.879, CFI =0.878, RMSEA = 0.081, indicating that the data and the model fit well.

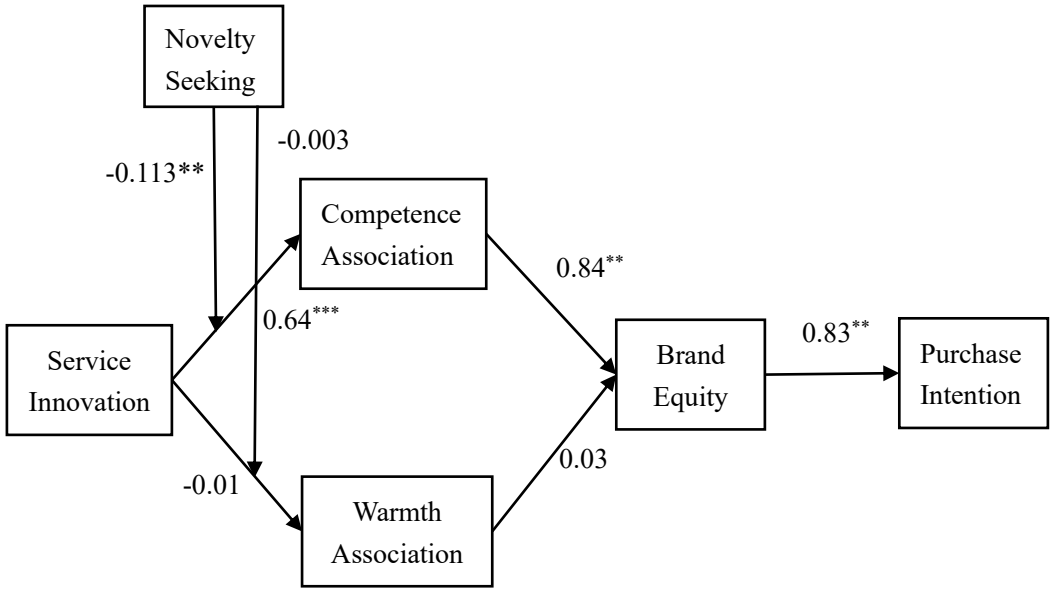
5.5.2 Path Analysis

Service innovation had a significant positive effect on corporate competence association, β=0.64, p<0.001, supporting Hypothesis H1. Service innovation did not have a significant negative impact on corporate warmth association, β=-0.01, p>0.05, thus Hypothesis H2 was not supported. Additionally, corporate competence association significantly positively influenced brand equity, β=0.84, p<0.05; however, corporate warmth association had no significant positive effect on brand equity, β=0.03, p>0.05.

Brand equity had a significant positive effect on purchase intention, β=0.83, p<0.05. Finally, the interaction between service innovation and novelty seeking was significant when corporate competence association was the dependent variable, β=-0.113, p<0.05, but not significant when corporate warmth association was the dependent variable, β=-0.003, p>0.05. These results will support the subsequent analysis of mediation effects.

Figure 5.1

Path Analysis



Note. Control variables: income, education, frequency of purchase, budget, gender, age.

5.6 Mediation Effect Analysis

The mediation effect was analyzed using the Bootstrapping method. Model 4 was selected, setting the confidence interval to 95% and the number of bootstrap samples to 5000 before proceeding with the analysis. The results indicated that corporate competence association mediates the relationship between service innovation and brand equity, with an indirect effect of 0.1751

and a 95% confidence interval of [0.1270, 0.2290], not including 0. As shown in Table 5-7, the total effect value of service innovation on brand equity is 0.5075, the direct effect value is 0.3324, and the indirect effect value played by corporate competence association in it is 0.1751, thus corporate competence association is partially mediated. Hypothesis H3a is supported. The mediation effect of corporate warmth association between service innovation and brand equity was not significant, with a 95% confidence interval of [-0.0133, 0.0183], including 0. Hypothesis H3b is not supported.

A sequential mediation effect analysis method involving two mediating variables was used to test the chain mediating role of corporate competence association / corporate warmth association and brand equity between service innovation and purchase intention. The PROCESS program in SPSS 21.0 software was used, selecting Model 6, setting the confidence interval to 95%, and the number of bootstrap samples to 5000 for analysis. The data analysis results showed that the sequential mediation effect from service innovation through corporate competence association and brand equity to purchase intention is significant, with a confidence interval of [0.0411, 0.0933], not including 0. Hypothesis H4a is supported. The data analysis results showed that the sequential mediation effect from service innovation through corporate warmth association and brand equity to purchase intention is not significant, with a confidence interval of [-0.0065, 0.0099], including 0. Hypothesis H4b is not supported.

Table 5.7

Mediation effect of corporate competence association

	Coefficient	BootSE	LLCI	ULCI	Relative Effect
Total Effect	0.5075	0.0333	0.4420	0.5730	
Direct Effect	0.3324	0.0327	0.2680	0.3968	65.5%
Indirect Effect	0.1751	0.0264	0.1270	0.2290	34.5%

Table 5.8

Mediation effect of corporate warmth association

	Coefficient	BootSE	LLCI	ULCI	Relative Effect
Total Effect	0.5075	0.0333	0.4420	0.5730	
Direct Effect	0.5070	0.0329	0.4423	0.5717	99.9%
Indirect Effect	0.0005(ns)	0.0076	-0.0133	0.0183	0.1%

Note. ns = not significant.

Table 5.9

Chain mediating effect competence association and brand equity

	Path	Coefficient	BootSE	LLCI	ULCI	Relative Effect
Total Effect	_	0.3834	0.0342	0.3162	0.4507	100%
Direct Effect	SI→PI	0.0738	0.0352	0.0045	0.1431	19.2%
Indirect Effect	SI→CA→PI	0.1238	0.0299	0.0669	0.1821	32.3%
	SI→BE→PI	0.1217	0.0256	0.0772	0.1773	31.7%
	SI→CA→BE→PI	0.0641	0.0134	0.0411	0.0933	16.7%
Total Indirect Effect	_	0.3097	0.0416	0.2324	0.3964	80.8%

Note. SI=Service Innovation; CA= Competence Association; BE=Brand Equity; PI=Purchase Intention.

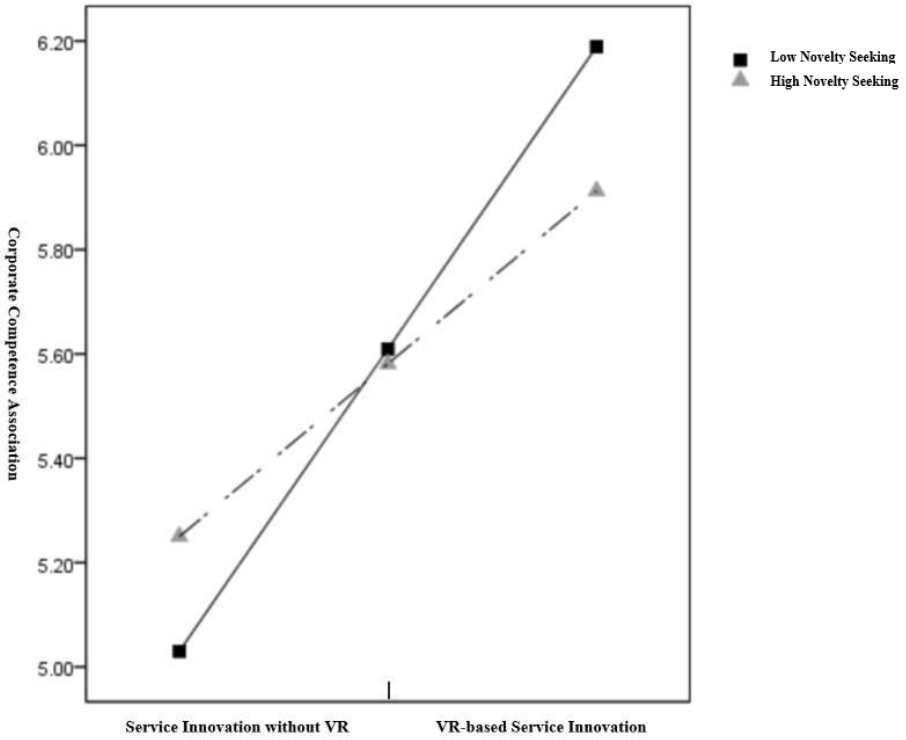
5.7 Moderating Effect Analysis

The moderating effect of novelty seeking on the relationship between service innovation and corporate competence association was analyzed using the PROCESS software. Model 1 was selected, setting the confidence interval

to 95% and the number of bootstrap samples to 5000 before proceeding with the analysis. The results indicate a significant interaction effect between novelty seeking and service innovation, with a significance of -0.0838, p<0.001, demonstrating a significant moderating effect of novelty seeking. Specifically, novelty seeking weakens the impact of service innovation, meaning the effect of service innovation on corporate competence association is weaker in groups with high novelty seeking than in those with lower novelty seeking. Hypothesis H5a is supported.

Figure 5.2

Moderating effect



The moderating effect of novelty seeking on the relationship between service innovation and corporate warmth association was analyzed using the PROCESS software. Model 1 was selected, setting the confidence interval to 95% and the number of bootstrap samples to 5000 before proceeding with the

analysis. The results show that there is no significant interaction between novelty seeking and service innovation, p=0.9225＞0.05.

The overall hypothesis test results are summarized as follows:

Table 5.10

Results of hypothesis testing

Hypothesis	Result
H1: VR-based service innovation is positively related to corporate competence association.	Supported
H2: VR-based service innovation is negatively related to corporate warmth association.	Not supported
H3a: Brand equity is positively related to corporate competence association. VR-based Service innovation enhances brand equity by increasing the corporate competence association.	Supported
H3b: Brand equity is positively related to corporate warmth association. VR-based Service innovation weakens brand equity by reducing the corporate warmth association.	Not supported
H4a: The relationship between VR-based service innovation and purchase intention is chain mediated by corporate competence association and brand equity. That is, there is a positive relationship between brand equity and purchase intention, and the relationship between VR-based service innovation and purchase intention is chain mediated by corporate competence association and brand equity.	Supported
H4b: The relationship between VR-based service innovation and purchase intention is chain mediated by corporate warmth association and brand equity. That is, there is a positive relationship between brand equity and purchase intention, and the relationship between VR-based service innovation and purchase intention is chain mediated by corporate warmth association and brand equity.	Not supported
H5a: Novelty seeking moderates the relationship between service innovation and competence association such that higher novelty-seeking weakens the relationship.	Supported
H5b: Novelty seeking moderates the relationship between service innovation and warmth association such that higher novelty seeking weakens the relationship.	Not supported

Chapter 6 Discussion, Implications, Limitations and Future Research

6.1 Conclusion

This research focuses on how to effectively enhance corporate associations through service innovation, thereby promoting the growth of corporate brand equity and increasing consumer purchase intention. Based on the Stereotype Content Model, this research constructs a theoretical model of "VR-based Service Innovation Corporate Associations Brand Equity Purchase Intention" and through two studies—a field experiment and a questionnaire survey—repeatedly tests the impact of VR-based service innovation on corporate associations, brand equity, and consumer purchase intention, as well as the chain mediating role of corporate associations and brand equity. Furthermore, it explores the differential impact of VR-based service innovation on corporate associations among consumers with different levels of novelty-seeking traits, revealing the following important conclusions：

First, utilizing VR technology for service innovation can impact consumers' corporate associations. Specifically, VR-based service innovation can enhance consumers' corporate competence association. This is because of the strong competence attribute inherent in VR technology, coupled with the human and material resources embedded in service innovation. Therefore, when faced with companies using VR technology for service innovation, consumers enhance their competence association, perceiving the company as reliable, capable, and competent. This research posits that VR-based service innovation can reduce consumers' warmth association. This is because VR technology itself

lacks warmth attributes, and using VR technology for innovative services reduces customer interactions with service personnel, failing to convey warmth and friendliness, making it difficult to establish positive emotional exchanges with consumers. Hence, using VR technology for service innovation significantly reduces warmth association. However, the final results indicate that using VR technology for service innovation does not affect consumers' warmth association. To explain this, I think that industry and corporate characteristics may serve as reasons why the hypothesis was not verified. The context of this research is the automobile purchasing scenario, where consumers are dealing with high-tech products like cars. The automobile industry, especially companies selling high-end brands like Mercedes-Benz and Audi, focuses more on competence than warmth, leading to a "floor effect" in consumers' warmth association with the company, preventing further reduction.

Second, VR-based service innovation can enhance brand equity by improving corporate associations. Specifically, VR-based service innovation can significantly enhance competence association. For high-tech products like automobiles, especially luxury cars, the factors and focus points considered by consumers in their purchasing decisions primarily relate to the functionality of the company's products and services. Therefore, corporate competence association has a significant impact on consumers' brand attitudes and behaviors. Competence association enhances the company's brand equity by strengthening consumers' perceptions of brand product quality and brand recognition. In the hypothesis section, this research also proposed that VR-based service innovation could weaken brand equity by reducing warmth association. This hypothesis was not verified. This could be because, for high-tech products like

automobiles, especially luxury cars, the factors and focus points considered by consumers in their purchasing decisions are mainly about the functionality of the products and services, not warmth. Therefore, VR-based service innovation cannot reduce consumers' warmth association, thereby weakening brand equity.

Third, corporate competence association and brand equity play a chain mediating role between VR-based service innovation and consumer purchase intention. VR-based service innovation can enhance consumers' corporate competence association, which, by improving consumers' perceived quality of brand products and brand recognition, enhances the company's brand equity, thereby positively influencing consumers' purchase intention.

Fourth, novelty seeking moderates the relationship between VR-based service innovation and competence association such that higher novelty-seeking weakens the relationship. The moderating hypothesis of novelty seeking between VR-based service innovation and corporate warmth association has not been verified.

6.2 Implications

6.2.1 Theoretical Implications

This research explores the impact and internal mechanism of VR-based service innovation on brand equity and consumers' purchase intention, which has certain theoretical significance. The theoretical contributions of this research can be divided into the following aspects:

First, the research revealed the positive effects of VR-based service innovation on brand equity. Brand equity can reduce corporate operating costs, build competitive advantages, help companies achieve differentiated

competition, and bring substantial economic value to companies (Choi & Seo, 2021; Lang et al., 2022; Oh et al., 2020). VR technology, with its characteristics of "immersion," "interactivity," and "imaginativeness," and its powerful functions, has become a common choice for companies to improve market performance and promote brand value in real business practices (Bogicevic et al., 2019; Jung et al., 2017; Yung et al., 2021b). According to statistics, the virtual reality (VR) technology market is vast, expected to grow from a scale of 2.6 billion US dollars in 2020 to 5 billion US dollars in 2023, and will continue to grow rapidly. However, whether such behavior is effective and can enhance a company's brand equity to bring certain benefits to the company is unknown. Existing research has not yet answered this question. In terms of VR technology research, the academic field is still in its infancy (Yung et al., 2021b). Currently, the focus is mainly on the application of VR technology, but most studies treat VR technology as a tool for creating environments to explore the effects of other factors, neglecting the impact brought by VR technology itself as a product. Moreover, current research primarily discusses the application effects of VR technology in education, medical fields, etc., neglecting the retail service sector. It's proposed that VR technology may become a new technological driving force for structural changes in the service industry in the future (Buhalis et al., 2019), hence the need to explore the use and effects of VR technology in the service industry. However, such studies are scarce at the moment. Therefore, this research explores the impact of VR technology on corporations and consumers in the field of retail services, enriches and deepens the research of VR technology, and can provide a theoretical basis and support for the subsequent exploration of VR technology in the field of retail services. In terms of service

innovation research, previous studies have mostly focused on cross-national differences in service innovation at the national level, such as the USA, India, Australia, etc., and collective innovation behavior from an industry perspective (Alam, 2007; Song et al., 2000). In contrast, this research pays more attention to the micro-level and technological factors, i.e., the service innovation behavior of individual companies based on emerging technologies, offering a new perspective for exploration and application. Through rigorous empirical research, this research found that VR-based service innovation can impact a company's brand equity, expanding the literature on service innovation and brand equity, enriching the outcome variables of service innovation, and extending the scope of research on service innovation.

Second, the research found that corporate competence association is more important than corporate warmth association, with corporate competence association being more conducive to enhancing brand equity and purchase intention. Current research on the stereotype content model mainly focuses on brands, countries, products, and other fields (Aaker et al., 2010; Barbarossa & Mandler, 2021; Bourdin et al., 2021; Feng et al., 2022; Liu et al., 2022; Pogacar et al., 2021; Pang & Bi, 2015), with limited studies on the antecedents and consequences of different dimensions of corporate associations at the corporate level. Previous research on the stereotype content model in the brand field has found a "golden quadrant" where consumers have positive emotions towards a brand when both competence and warmth associations are high, leading to positive brand attitudes and purchase intentions. However, differences in the impact of competence and warmth associations on consumer attitudes and behaviors have been less explored. This research, through empirical research,

found that there are differences in the effects of competence and warmth associations on consumer attitudes and behaviors. Particularly in the retail service sector, corporate competence association is more beneficial in enhancing brand equity and purchase intention. This research enriches and deepens the research on corporate associations and expands the application scope of the stereotype content model.

Third, the research identified the moderating role of the consumer's personal characteristic of novelty seeking. Specifically, consumers with high novelty-seeking traits usually have a higher curiosity and exploratory nature, expecting more from corporate competence (Gocłowska et al., 2019). In contrast, consumers with low novelty-seeking traits tend to be conservative, orderly, and mild-mannered, with lower expectations for corporate competence. The application of VR-based service innovation can provide breakthrough experiences for consumers with lower levels of novelty seeking, thus more strongly enhancing their perceptions of corporate competence. As consumers' novelty-seeking levels increase, this enhancing relationship weakens. The results of this research demonstrate the positive effects of novelty-seeking traits, impacting consumer cognition. Previous research on novelty seeking has focused more on the physiological mechanisms and negative impacts, such as how high levels of novelty seeking can lead to addiction, antisocial behaviors, and excessive risk-taking behaviors (Wills et al., 1994). Cloninger even considered novelty seeking as a pathological personality deficit (Cloninger, 1988). This research explores how consumers' levels of novelty-seeking traits affect the impact of VR-based service innovation on corporate competence association in a real consumption context. It further enriches the research on

novelty seeking in consumer cognition and behavior, highlighting the positive roles of novelty seeking and its research value in marketing and consumer behavior.

6.2.2 Practical Implications

This research focuses on the impact of VR-based service innovation, and can provide some practical enlightenment for enterprises on how to more effectively apply VR technology to service innovation, enhance the brand equity of enterprises, and increase consumers' purchase of enterprise products:

First, tech companies should make good use of emerging technologies, such as VR technology. In today's highly competitive business environment, companies continuously pursue innovation to gain a competitive edge and meet the ever-changing needs of consumers. Service innovation, as an important competitive strategy, is widely considered a key pathway for businesses to achieve sustainable development and enhance brand value. Developing effective strategies for service improvement and innovation to enhance the company's brand assets and increase consumer purchase of company products has always been an important direction of focus and pursuit for companies (Su & Li, 2022). This research suggests that in the aspect of service innovation, companies can consider introducing VR technology as an effective strategy, such as acquiring VR devices. This is because VR technology possesses powerful functionalities that can enhance the immersive and personalized aspects of service experiences. With the aid of VR technology, companies can present the features and advantages of products in a more intuitive and vivid manner, helping consumers to experience the products more deeply and understand their functions. For example, in automobile 4S stores, VR

technology can be introduced for virtual car model displays, showcasing the entire range of a brand's car models, including cars with various configurations and colors. Through virtual reality glasses or screens, consumers can browse and compare different models in a more intuitive and vivid way, fully understand the characteristics and advantages of different brands of cars, so as to better choose the models that meet their own needs. VR technology can also be used for virtual test drives, allowing consumers to feel the joy of driving and experience the sensation of driving various models, including acceleration, turning, and braking, without actually driving the vehicle. This virtual test drive can not only provide a more realistic driving experience but also allow consumers to better understand the vehicle's performance and driving feel before making a purchase. Moreover, in automobile 4S stores, VR technology can also be used for customized configuration displays, assisting consumers in customizing their ideal car configurations. Through a virtual reality environment, consumers can freely choose vehicle colors, interiors, rims, accessories, etc., customizing a car configuration that meets their personalized needs. Through VR technology, companies can establish an image of advanced technology and innovation in the minds of consumers, enhancing trust in the company's competence, strengthening brand equity, and effectively increasing consumer purchase intention.

Second, tech companies must focus on enhancing competence association. The findings of this research indicate that competence association can effectively improve a company's brand equity, thereby increasing consumer purchase intention. This suggests to business managers the importance of focusing on the role of competence association. Taking automobile companies

as an example, they should focus on pursuing a capability strategy. In this industry, capability means safety, which is are focal points in consumer purchase decisions. Automobile companies should take measures to highlight their capabilities, such as introducing advanced technology; emphasizing capability in slogans or company/product introductions, highlighting company strength and vehicle performance. Although, due to industry characteristics, the hypothesizes regarding warmth association were not supported in this research. Existing research indicates that warmth association also affects brand equity and consumer buying behavior (Hartmann & Apaolaza-Ibáñez, 2012; Luo & Du, 2015; Fan et al., 2024; Gong et al., 2022). Therefore, in certain scenarios that require warmth or for companies dealing with lifestyle products, warmth association should also be valued. For example, when automobile companies sell special types of vehicles, such as family cars, they can emphasize warmth attributes while highlighting capabilities, to better enhance their brand equity and stimulate consumers' purchase intention. Similarly, companies selling personalized car configurations or furniture can enhance consumers' warmth association towards the company by creating a cozy environment.

Third, tech companies should pay attention to consumer personal characteristics, as these can significantly influence their decision-making behavior. The findings of this research confirm that individual characteristics, such as novelty seeking, can affect consumers' cognition and purchasing behavior. This highlights for managers the importance of recognizing and leveraging consumer individual differences through targeted actions. For instance, in business operations, companies could establish a comprehensive customer information database for targeted marketing efforts, unearth potential

customers, enhance new customers' loyalty towards the brand, and maintain relationships with existing loyal customers. Taking automobile sales companies as an example, for consumers visiting to view cars, the company could encourage them to fill out personal basic information, the number of cars currently owned, preferred car brands, etc., through the offering of gifts. Based on the collected and organized information, automobile sales companies can provide targeted services, such as promptly informing customers who like the Audi brand about new Audi models, prices, etc.

6.3 Limitations and Future Research

Although this research has some theoretical and practical contributions, there are still the following limitations:

First, the research validated hypotheses H1, H3a, H4a, and H5a, but did not confirm hypotheses H2, H3b, H4b, and H5b regarding warmth association, possibly due to industry and company characteristics-related "floor effect". Specifically, the field experiment and survey focused on the automotive industry, characterized by a focus on competence rather than warmth, particularly in high-end car dealerships like Mercedes and Audi, where warmth is even less pronounced. Thus, introducing VR technology for service innovation could not further reduce already very low levels of warmth association, thereby affecting brand equity and consumer purchase intention. Future research could explore companies with higher degrees of warmth, like car accessories businesses or other industries, for further investigation. Moreover, the real consumer scenarios in this research were limited to car purchasing contexts, and while various methods were employed to enhance external validity, it did not confirm the generalizability to other businesses, such as tourism or real estate firms

(Flavián et al., 2019b; Huang et al., 2016; Pleyers & Poncin, 2020; Wei, 2019). Future studies might explore different consumer purchasing contexts to verify the conclusions of this research, examine the applicability and effectiveness of VR-based service innovation in other business product purchasing contexts, and expand the research's external validity. They could also attempt to test and exclude some competing mechanisms of this impact mechanism to enhance the research's internal validity.

Second, this research only examined the impact of VR-based service innovation on corporate associations, brand equity, and consumer purchase intention. Future research could validate other brand variables and consumer behavior variables. Existing studies suggest that besides enhancing purchase intention, VR technology can positively impact consumer immersion (Morélot et al., 2021), presence (Yung et al., 2021a), emotions (Yung et al., 2021b), satisfaction, and affection towards a company (Kim & Ko, 2019). Future research could explore a more diverse range of positive and negative effects of VR-based service innovation.

Third, this research only tested the mediating role of corporate competence association. The results showed that although the competence association played a partial mediating role, the competence association's mediation was low compared to the direct impact. So there may be other potential mediators, such as pleasure (Dad et al., 2018), presence (Tussyadiah et al., 2018), and satisfaction (Flavián et al., 2019a). Future research can continue to explore.

Fourth, this research only explored the influence of the novelty-seeking personal characteristic on the relationship between VR-based service innovation and corporate associations. However, consumer personal characteristics are not

limited to novelty-seeking but include sensation-seeking (Ju et al., 2020), the Big Five personality traits (openness, conscientiousness, extraversion, agreeableness, neuroticism) (Lu & Li, 2016), and others. Furthermore, factors like consumer motivation (Zhu et al., 2023) and product type (Fan et al., 2024) might also impact the relationship between VR-based service innovation and corporate associations. Future research could further explore other moderating variables and boundary conditions based on the mechanism tested in this research (VR-based service innovation → corporate associations → brand equity → purchase intention), potentially including product type and personal traits. This could provide businesses with more targeted and practical recommendations by also attempting to exclude and test alternative explanations for corporate association mediation.

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Appendix: Questionnaire

Dear Madam/Sir,

Hello! We are the sales team of Pengfeng. We sincerely invite you to participate in this consumer behavior survey. The survey is conducted anonymously, and the collected data will be used to understand customer needs and provide better service quality. Your answers will be kept confidential. Completing this survey will take approximately 5 minutes. During the survey, you have the right to discontinue participation for any reason at any time.

Before entering the formal questionnaire, we will conduct an attention test. Please select red as the answer to the following question. If you do not choose the red option, it will be regarded as insufficient concentration.

Q1 what color is the water of Lake Urmia?

○ Green ○ Blue ○ Red ○ Orange

Q2 Based on your recent experience at Pengfeng receiving service, please select your level of agreement with the following statements by marking the corresponding checkboxes with a '√'.

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
The service is totally new to Pengfeng	1	2	3	4	5	6	7
The service allows Pengfeng to enter a new market	1	2	3	4	5	6	7
The service creates a new product line for Pengfeng	1	2	3	4	5	6	7
The service is totally new to the market	1	2	3	4	5	6	7
The service offers new features versus competitive products	1	2	3	4	5	6	7
The service requires a change in the customer's buying behavior	1	2	3	4	5	6	7

Q3 How would you rate Pengfeng? To what extent do you agree with the following statements? Please mark the corresponding checkboxes with a '√' for your response.

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
Pengfeng is competence	1	2	3	4	5	6	7
Pengfeng is effective	1	2	3	4	5	6	7
Pengfeng is efficient	1	2	3	4	5	6	7
Pengfeng is warm	1	2	3	4	5	6	7
Pengfeng is kind	1	2	3	4	5	6	7
Pengfeng is generous	1	2	3	4	5	6	7

Q4 Based on your true feelings, please select your level of agreement with the following statements by marking the corresponding checkboxes with a '√' for your response.

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
I consider myself to be loyal to Pengfeng	1	2	3	4	5	6	7
I will not buy other brands if Pengfeng is available at the choice	1	2	3	4	5	6	7
I can recognize Pengfeng among other competing brands	1	2	3	4	5	6	7
I am aware of Pengfeng	1	2	3	4	5	6	7
Some characteristics of Pengfeng come to my mind quickly	1	2	3	4	5	6	7
I can quickly recall the symbol or logo of Pengfeng	1	2	3	4	5	6	7
It makes sense to go to Pengfeng instead of any other brand, even if they are the same	1	2	3	4	5	6	7
Even if another brand has the same features as Pengfeng, I would prefer to buy a car in Pengfeng	1	2	3	4	5	6	7

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
If there is another brand as good as Pengfeng, I prefer to buy a car in Pengfeng	1	2	3	4	5	6	7
If another brand is not different from Pengfeng in any way, it seems smarter to buy	1	2	3	4	5	6	7

Q5 Based on your true feelings, please select your level of agreement with the following statements by marking the corresponding checkboxes with a '√' for your response.

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
I am willing to buy a car in Pengfeng	1	2	3	4	5	6	7
The likelihood that I buy a car in Pengfeng is very high	1	2	3	4	5	6	7
I am likely to buy a car in Pengfeng in the future	1	2	3	4	5	6	7

Q6 How would you describe yourself? To what extent do you agree with the following statements? Please mark the corresponding checkboxes with a '√' for your response

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
I usually seek out new opportunities or experiences	1	2	3	4	5	6	7
I prefer change to routine	1	2	3	4	5	6	7
I seek adventure	1	2	3	4	5	6	7
I am always interested in finding new things to try	1	2	3	4	5	6	7
I love to think up new ways of doing things	1	2	3	4	5	6	7
I place a lot of importance on	1	2	3	4	5	6	7

	Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
experiencing new things							
I like to begin new things	1	2	3	4	5	6	7
I am open to change	1	2	3	4	5	6	7
Trying new things is important for me to stay happy	1	2	3	4	5	6	7
I enjoy hearing new ideas	1	2	3	4	5	6	7
I like to visit new places	1	2	3	4	5	6	7

Q7 Which brand of car do you plan to buy? _____

Q8 How many times have you bought a car in Pengfeng? _____

Q9 What is your budget for buying a car? _____

Please provide your personal information:

Gender	○Male		○Female	
Age	○ 18-20	○ 21-30	○ 31-40	○ 41-50
	○ 51-60	○ 60 or more		
Highest Education Level	○Primary School and below	○ Junior Middle School	○ High School /Technical Secondary School/Technical School/Secondary Vocational Technical School	○ Junior College
	○ Bachelor's Degree	○ Master's Degree	○ Doctor's Degree	
Occupation	○ Student	○ State-Owned Enterprise Employee	○ Public Institution Employee	○ Civil Servant
	○ Private Enterprise Employee	○ Foreign Enterprise Employee	○ Other	
Income (Unit: Yuan)	○ 3000 or less	○ 3000-5000	○ 5001-7000	○ 7001-10000
	○ 10001-20000	○ More than 20000		