




The impact of servicescape on consumer behavior from the perspective of territorial perception

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Abstract

This study aims to investigate the impact of physical and social factors in the servicescape on customer behavior through the mediation of customer territorial perception. Employing a quantitative analysis approach, the research conducted a questionnaire survey on 462 casual dining restaurant consumers in China, using a convenient sampling technique. Statistical tools are used to explore the influence mechanisms of territorial factors in the servicescape on customer behavior through territory perception. The study revealed that both physical and social factors in the servicescape significantly influence customers' territorial perception, subsequently impacting their behavior. By providing a new perspective on service marketing research, this study extends the existing research area and reflects the impact of customer-business and customer-customer interactions on business operations. It also reflects the hot research direction of customer experience in the servicescape. The practical significance of this research is highlighted for casual dining restaurant managers, emphasizing the necessity of comprehensive strategies, including overall planning of the service environment, functional layout design, and social interaction, to effectively manage the customer experience. Using territorial perception in the SOR (Stimulus-Organism-Response) model, this study gives useful information about territorial perception and could have a big effect on the service industry and market research by giving useful information for making the service environment better and customers happier.

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1. Introduction

Bhabha (1994) proposed the theory of the Third Space, which broadened our understanding of space. The Third Space transcends physical and spiritual dimensions, achieving a fusion among time, space, and society. In a study of Starbucks coffee shops, an intriguing phenomenon was observed: after purchasing their coffee, most customers would choose a comfortable spot and stay in the cafe for an extended period (Tamkaew, 2021). From the Third Space perspective, the cost of coffee is not just derived from the cost of a cup; neither is the duration of the consumption the primary reason (Kramsch & Uryu, 2020). Both customers and the business decide the consumer experience through spatial and service sensations, among other situational factors (Witell et al., 2020). The need for a spatial territory or personal space is seen as one of the vital human needs, thought to be linked to instinct (Thompson & Arsel, 2004). Before 2020, crowding was a common occurrence in daily

life; we shared public spaces on public transportation, in malls, and in restaurants. However, in these shared spaces, there emerged a sense of "personal ownership" (Casimir, 2021). For instance, the first customer to arrive at a restaurant might feel a priority towards the table they chose; in cafes or libraries, customers might use personal items like backpacks or books to occupy space, keeping a certain distance from others; or a customer might call out to a waiter, saying, "Please come to my table to take the order" (Shoari, Ezzati, Baumgartner, Malacarne, & Fecht, 2020). Zoological literature refers to this phenomenon as territoriality, and its study has gradually expanded to fields like sociology and management (Taylor & Brooks, 1980). Territoriality is a boundary regulation mechanism rooted in ownership, concerning both space and psyche (Kamath & Wesner, 2020). In the service sector, customers are involved in the production process, interacting with businesses, employees, and service scenarios (Ashley, Gilbert, & Leonard, 2020). This can give rise to a strong sense of territoriality, which directly impacts customer behavior. This territorial awareness can reflect the customer's identification with a business, boosting their purchasing inclination (Griffiths & Gilly, 2012). Still, it might also lead to strong defensive or aggressive behaviors towards other customers or staff, severely affecting business operations. Therefore, understanding this sense of customer territoriality is crucial for businesses to comprehend consumer behavior (Sommovigo, Setti, Argentero, & O'Shea, 2019). After 2020, under the influence of the COVID-19 virus, "social distancing" became part of the new norm (Chauhan, Banerjee, & Dagar, 2023). To ensure health safety, social distance became a necessary factor for both consumers and businesses to consider (Tuzovic & Kabadayi, 2021). We need to rethink the consumption environment and maintain an appropriate density to preserve the customer experience (Tomazelli, Broilo, Espartel, & Basso, 2017). Hence, consumer territorial perception should receive ample attention.

Philip Kotler (1973) defined store atmosphere as "the design of buying environment factors, striving to create a particular shopping mood to enhance the customer's purchase intention." Psychologists Mehrabian and Russell (1974) introduced the S-O-R model, which posits that environmental variables, acting as stimuli, can drive customer emotions and evaluations, subsequently influencing customers' behavioral responses to approach or avoid. Put differently, the environment can serve as an external stimulus, affecting an individual's psychological state and perception and subsequently determining their behavioral tendencies (Lee, Xu, & Porterfield, 2022).

Bitner (1992) introduced the "servicescape" in her "Service Environment Framework" to refer to the various carefully designed and controllable physical environment elements in service settings. "Servicescape" has gradually become a standard term in the study of service environments. Some researchers have expanded the scope of the servicescape from the physical dimension to less apparent dimensions, including the social and symbolic dimensions influenced by society and groups (Kandampully, Bilgihan, & Amer, 2023). Morkunas and Rudienė (2020) categorized the social aspects of the servicescape into staff, customers, social density, and the emotions of others. Pizam and Tasci (2019) introduced the term "experiences cape," referring to the enhancement of a hospitable organizational culture that includes employees and other stakeholders in that environment.

In recent years, due to the continuous development of service marketing, the interaction between customers and the servicescape has become increasingly rich. From the perspective of the service process, customers' territorial perceptions play a vital role in the service environment (Kim & Yun, 2019). However, existing studies have focused more on the outcomes of these perceptions and neglected the process. They emphasize the functional benefits of the servicescape while overlooking the cognitive and aspirational aspects of customer psychology. This shows that there's not only an urgent need for research on territorial elements within the servicescape but also ample room for further in-depth studies due to the limitations of existing research. Based on Rosenbaum and Massiah (2011) classification, this study divides the servicescape into physical factors and social factors. Physical factors include object density and social crowding, while social factors comprise service personnel and other customers.

Although the impact of the environment on customers is widely recognized, there is a lack of theoretical and empirical research in this field, specifically within the context of casual dining restaurants and from the perspective of customers (Kotler & Keller, 2016). Gadenne, Kennedy, and McKeiver (2009) summarized by stating, "There is a deficiency in examinations and research on the influence of the environment on customer purchasing decisions, and future studies should reinforce empirical research in this area." Therefore, this paper focuses on the servicescape of casual dining restaurants and the territorial perceptions and behaviors of customers in real consumption scenarios, delving deeper into the S-O-R theory based on previous research.

2. Literature Review and Hypotheses

2.1. Perceived Territoriality Based on Human Territoriality Theory

Perceived territoriality is defined as the behavior of claiming and defending territory to ensure a series of spaces are used for various activity performances and to influence, affect, or control access and interaction (Tussyadiah, 2012). The operational concept of territorial perception in this study refers to the extent to which an individual feels they possess their own space. Brown, Lawrence, and Robinson (2005) were the first people in organizational research to talk about territoriality. They said that intra-organizational territoriality is "behavioral expressions of individuals within organizations based on their psychological ownership of

perceived physical or social phenomena.” They also said that territorial perception comes from two basic needs: the need for privacy and the need to belong. However, human territories go beyond the realm of actual ownership. Indeed, individuals often utilize common rituals and symbolic boundaries to mark territories temporarily when occupying spaces (Ashley & Noble, 2014; Griffiths & Gilly, 2012). According to the human territoriality theory (Sack, 1983), user satisfaction with a space is contingent on their perceived level of territoriality. This theory defines perceived ownership of a particular space, even when all individuals are assigned an equal amount of space. Perceived territoriality is measured by an individual's perception of occupying and controlling a specific space. Since the perception of a user's territorial space is considered a key factor in determining satisfaction, perceived territoriality has been examined in several different application settings, including residential dormitories and public library environments (İmamoğlu & Gürel, 2016). According to studies, the degree of physical space separation from others and psychological desire for preferred privacy levels both affect how individuals perceive their own territoriality.

2.2. Servicescape based on S-O-R model

Mehrabian and Russell (1974) introduced the “Stimulus-Organism-Response” (S-O-R) model to reveal the psychological and behavioral reactions of individuals to environmental stimuli. The S-O-R model has been widely used to study the relationships between the physical environment, customer emotions, and customer behavioral intentions. The theoretical foundation is that customers are influenced by the atmosphere created in the retail environment, which in turn impacts their emotional states, leading to cognitive and behavioral changes. Early research showed that the way a customer acts in a consumption environment is affected by the emotions and feelings that environment creates (Donovan, Rossiter, Marcolyn, & Nesdale, 1994). This includes avoidance behavior and other variables in the S-O-R model. Hence, customers' behavioral responses to different environments stem from different emotions. Mehrabian and Russell (1974) categorized people's emotional reactions to environmental cues into three dimensions: pleasure, arousal, and dominance (PAD). These three distinct emotional combinations result in different behavioral outcomes, determining whether someone decides to continue staying in a specific environment; that is, whether they adopt an approach behavior or an avoidance behavior.

Wakefield and Blodgett (1999) found that the positive emotional state of customers is positively correlated with the time they spend in the store, the number of items they purchase, and the total amount they spend. Control over the environment can significantly influence customer shopping behavior. These behaviors not only impact the profits of service businesses but are also closely related to customer loyalty. Therefore, using the physical environment to evoke positive emotions in customers and induce their approach behaviors has become a matter of great concern for service businesses. Baker, Parasuraman, Grewal, and Voss (2002) also studied the connection between the physical environment and the psychological state of customers. He believed that an individual's emotional response to the environment reflects the environment's ability to evoke emotions, namely, the extent to which customers feel pleasure and are motivated in that environment. He examined the impact of two types of environmental factors on customer emotional evaluations and found that ambient factors (exemplified by background music) and social factors (represented by store attendants) collectively influence the level of pleasure customers feel, while social factors impact the degree of customer arousal. Their findings are consistent with the viewpoints of the S-O-R model. As research on the S-O-R model has grown and become more in-depth, many researchers have started to look into how servicescape factors, especially the social and symbolic parts of the servicescape, affect different types of customer behavior. They are doing this from a wider range of related social psychology and organisational behavior theories, such as the emotional event theory, and the social facilitation theory. In the related research on social factors in the servicescape, besides the traditional approach and avoidance behaviors, many scholars have noticed customer participation behaviors, such as interactions among customers and collaborations between customers and service employees. In the influence of social factors in the servicescape on customer behaviors, in addition to traditional approach behaviors, avoidance behaviors, and customer participation behaviors, many scholars have begun to pay attention to customer civic behaviors, such as word of mouth, recommendations, and helping other customers.

2.3. Servicescape and Perceived Territoriality

After reviewing the existing literature, we found that most studies on the mechanism of servicescape effects are based on the S-O-R model. This study posits that territorial perception will play a significant role in the dining experience of consumers. Tombs and McColl - Kennedy (2013), drawing from the behavioral context theory, introduced the crucial role of social and symbolic elements in the social servicescape, emphasizing that the number of people in an environment and the emotions exhibited by other customers can influence customer emotional responses, cognitive reactions, and purchase intentions. Recent literature on solo dining has found that "spatial closeness" with others leads solo diners to perceive high levels of crowding, negatively affecting their overall dining experience (Her & Seo, 2018; Terrault et al., 2018). This aligns with previous literature discussing the appropriate space for restaurant tables (Rosenbaum & Massiah, 2011). Mehta (2013) research indicates that crowding can lead to feelings of anxiety, anger, and boredom, with

responses varying based on the situation or individual. In daily life, individuals tend to maintain a comfortable physical or interpersonal distance from others. However, a crowded environment disrupts this comfort, forcing close contact with others, encroaching on personal space, and leading to corresponding psychological perceptions. In a retail environment, factors like product quantity, interior configuration, ceiling height, and aisle width can either amplify or mitigate the physical stimuli influencing an individual's perception of crowding. On the other hand, the number of individuals and social interactions in a service scene can stimulate perceptions of crowding. Individuals' perceptions of crowding can vary even within physically identical crowded environments. Under the perception of spatial constraints, both the physical and social aspects of a crowded environment can make an individual feel their personal territory is being invaded (Worchel & Teddie, 1976). Brown et al. (2005) proposed that the emergence of territorial perceptions arises from two fundamental needs: the need for privacy and the need for belonging. Therefore, when considering the physical territorial factors in the service scene, this study approaches both spatial and social dimensions and proposes the following hypotheses:

H₁: Reasonable object density has a positive impact on consumers' territorial perceptions.

H₂: The social crowding has a negative impact on consumers' territorial perceptions.

Baker et al. (2002) believe that when defining the elements of the service environment, in addition to considering tangible or intangible physical factors, interpersonal and social factors should also be considered. The social factors primarily pertain to personnel, referring to human-related elements in the environment, including other customers and company staff. Bitner (1992) argues that frontline service staff's interactions with customers significantly impact perceived service quality. The language, demeanor, attitude towards customers, responsiveness of service staff, and the influence of other customers can all affect the emotions and cognition of the customers, further determining their purchasing behavior and intention to return. The timing of delivering drinks and refilling them by the restaurant staff, or the phase where self-service pastry shop staff guide customers in designing products, can influence customers' territorial perception. Limiting customers' access as the store's service time approaches or showing signs of impatience can make customers feel that their territory is being invaded, leading to retaliatory behavior, abandonment, or negative word of mouth.

Kong and Jogaratnam (2007), based on customers' varying cultural backgrounds, studied the impact of staff behavior during interactions on customer satisfaction in both the US and South Korea. Their findings suggested that in different cultural contexts, the behavior of staff during interactions has varied effects on satisfaction. The study also supported Winsted (2000) view that cultural background influences customer perceptions during service encounters. Baker et al. (2002) pointed out that excessive crowding and staff shortages can affect customers' perceptions of the store. In interactions between staff and customers, inappropriate intrusions can decrease the evaluation of service staff by customers, leading to changes in customers' purchase intentions (Esmark, Noble, & Breazeale, 2017). It's been demonstrated that gazes can make people uncomfortable. Customers ensure the quality of service they receive through means such as gaze, speech, and refusal to share tables. In coffee shops, customers desire undisturbed personal spaces and maintain a certain distance from others. Loud, rude customers, overly crowded environments, or disordered customer interactions can lead to a loss of territoriality for customers, preventing a satisfying service experience. Extensive empirical literature has explored the impact of various environmental variables in service settings on customer emotional reactions, cognitive evaluations (such as satisfaction and impression of the service venue), and a series of behavioral responses (such as dwell time, purchase quantity, and impulse buying). Based on the "S-O-R" model, with the behaviors of service staff and other customers acting as environmental stimuli, customer perceptions are triggered. Therefore, when considering territorial social factors in the service scene and combining Baker's classification of social factors, encompassing other customers in the environment and company service staff, the following hypothesis is proposed:

H₃: Appropriate behaviors of other customers have a positive impact on consumers' territorial perception.

H₄: Unreasonable intrusions by service employees have a negative impact on consumers' territorial perception.

2.4. Perceived Territoriality and Consumer Behaviour

In marketing literature, perception is considered a key factor in establishing enduring customer relationships. Thus, there is a natural connection between perception and behavioral intention, reflecting the rational decision-making process of customers. Numerous empirical studies have verified the existence of this relationship. Cronin, Brady, and Hult (2000) and colleagues, using six different service industries as contexts, established the relationships among perceived value, satisfaction, and behavioral intentions. Eggert and Ulaga (2002) and other researchers introduced two conceptual models to examine the pathways through which perceived value influences satisfaction and behavioral intent. Their findings indicated that perceived value exerts both a direct impact on behavioral intention and an indirect effect through satisfaction. Additionally, Sack (1983) posited that perceived territoriality plays a crucial role in determining space users' satisfaction and intention to reuse. Abu-Obeid and Ibrahim (2002) emphasized the significance of perceived territoriality among dormitory residents in enhancing their satisfaction. According to empirical research by Wu, Mattila, and Han (2014), when a customer share a table at a coffee shop, they perceive a lower territorial occupancy rate, which heightens their perception of crowding and influences their evaluation of the service experience

negatively. Chan, Wan, and Tam (2021) investigated consumers' perceptions of restaurant setups during the COVID-19 pandemic, revealing that partitions between tables were perceived more positively than having mannequins at tables. Kukanja, Planinc, and Sikošek (2020) researched consumers' degree of seat occupancy in restaurants and found it influenced their perceived service quality. Research by Moon, Bonn, and Cho (2020); Sack (1983) and Wu et al. (2014) indicate that higher levels of perceived territoriality often produce positive outcomes for consumers, suggesting that perceived territoriality is positively associated with customer satisfaction, service experience, intentions to revisit, and recommendations. Taylor proposed in Taylor and Brooks (1980) that there is a close covariant relationship between territorial cognition and behavior. Based on the above studies, the following hypotheses are proposed:

H₁: Customer perceived territoriality has a positive effect on customer behaviour.

2.5. Servicescape and Consumer Behaviour

Service providers hope that the servicescape can prompt customers to form favorable behavioral attitudes towards service consumption, such as repurchase intentions and increased spending. According to some studies, the S-O-R model has three variables: the stimulus variable (Stimulus) is about servicescape factors; the organism variable (Organism) is about perceptions and loyalty; and the response variable (Response) is about how consumers plan to act. According to the Gestalt psychology theory proposed by Bitner (1992) and Namasivayam and Mattila (2007), customers perceive the service environment holistically. Such perceptions influence their emotional and cognitive responses, subsequently affecting their behavioral tendencies. Kim and Yun (2019) conducted research on themed restaurants to examine the impact of various cues in the service scene on customer cognition (perceived service quality), emotion (pleasure), and their behavioral intentions. The study found that pleasant emotions and higher service quality directly and positively influence customers' intentions to revisit. Turley and Milliman (2000) consolidated studies on environmental stimulus factors published from 1964 to 1997, discovering that although there are various methods for measuring and categorizing environmental stimuli in scenes, nearly every piece pointed out the significant connection between scene cues and behavioral intentions. Among these 60 publicly published articles, 28 researched the influence of environmental stimuli on sales volume, purchasing behaviors, and impulse buying. Of these, 25 found that environmental variables affect consumer purchasing behaviors; 16 studies identified that environmental variables significantly influence consumers' dwell time; and 8 took the customers' approach-avoidance behavior as the dependent variable. Therefore, this research proposes the following hypothesis:

H₆: Adequate object density in the servicescape has a positive impact on customer behavioral.

H₇: Social crowding in the servicescape has a negative impact on customer behavioral.

H₈: A favorable impression of other consumers in the servicescape has a positive impact on customer behavioral.

H₉: Inappropriate intrusion by service employees in the servicescape has a negative impact on consumer customer behavioral.

From this, the conceptual framework for research is established (see Figure 1).

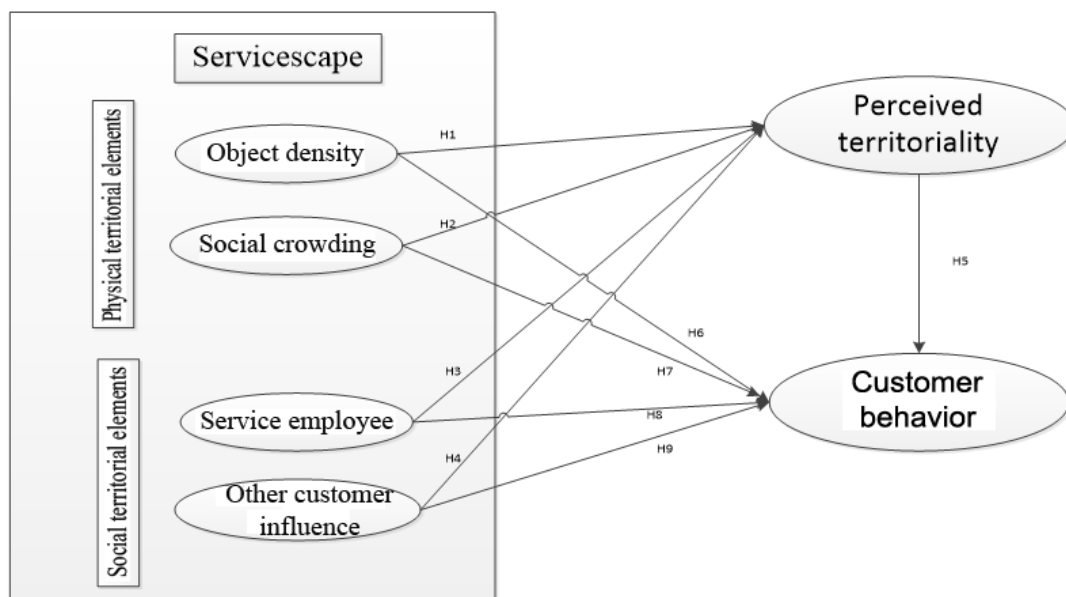


Figure 1. Conceptual framework.

The model utilized in the study extends and enriches the S-O-R (Stimulus-Organism-Response) model by incorporating territorial perception into it. While Bitner (1992) initially proposed that emotional responses could influence the relationship between the servicescape and customer behavior, prior research primarily

explored the impact of environmental stimuli on customer emotions. Previous studies often focused on a singular pathway, considering only the influence of emotions on customer consumption behavior. In contrast, this study validates the significant role of territorial perception.

3. Research Method

3.1. Data Collection and Sampling

In selecting the research subjects, strict criteria were applied in terms of geographical and service industry considerations. Given the focus of this paper on the impact of the servicescape on customer territorial perception and behavior, the study primarily concentrated on one of the typical businesses in the leisure service industry—casual dining restaurants. Therefore, the research scope was limited to casual dining establishments. In this study, casual dining establishments were defined as places where wait staff serves customers after they have taken their seats. Casual dining refers to dining establishments that offer a certain level of table service. Compared to fine-dining restaurants, these establishments typically have longer operating hours and more flexible dining times. Examples include coffee shops, casual Chinese and Western restaurants, and tea houses. Such restaurants involve customers dining or engaging in leisure activities within specific areas, featuring higher customer traffic and a relatively larger table density, which can trigger situations conducive to territorial perception. This provides a better opportunity to explore the influence of the servicescape on customer territorial perception and behavior.

The research primarily focused on short-term and medium-term effects, considering customers' experiences during their dining periods. Several casual dining restaurants in Taiyuan, China, with an average per capita spending range of 50 to 150 yuan, were selected for the study. The study spanned a continuous week, specifically during dinner hours, to minimize sample bias. Considering the fluidity and uncertainty in the total number of customers in casual dining restaurants, the study utilized convenience sampling; a type of non-probability sampling that is relatively straightforward and involves distributing questionnaires to customers entering the restaurant during specific time periods.

Sampling was conducted during specific time slots, particularly during dinner peak hours. Paper or online questionnaires were distributed to customers currently dining, and online questionnaires were given to those who had already finished their meals. As this study employed convenience sampling, the larger the sample size, the higher the reliability of the results. Referring to the sample size of at least 385 recommended for simple random sampling in probability sampling, and multiplying it by 1.2, a total of 462 questionnaires were distributed in this study, with 450 valid responses received. The valid sample rate is 97.4%, meeting the requirements for statistical analysis.

3.2. Survey Instrument and Measures

The survey instrument was divided into six sections. The first section was the servicescape scale. Based on Rosenbaum and Montoya (2007) classification of the servicescape into physical and social factors—with social factors including service employees and other customers—this study further divided the concept based on Brown's research. When considering physical territorial factors, the study approached it from both spatial and social dimensions, subdividing it into object density and social crowding. The primary scales adopted were from scholars such as Moon et al. (2020) (for object density), Jang, Ro, and Kim (2015), Chan (2021) (for social crowding), Brocato, Baker, and Voorhees (2015) (for other customers), and Ashley and Noble (2014) (for service employees).

The second section was the territorial perception measurement scale. This section utilized the territorial perception scales developed by Moon et al. (2020) and Zhang, Wei, Line, and McGinley (2021) in the context of restaurants.

The third section focused on the consumer behavior scale. To make the consumer behavior metrics for this study, the approach-avoidance behavior scale from Jang et al. (2015) and the behavioral intention measures from Lin and Liang (2011) were put together. All scales in the study used a 5-point Likert scale, where 1 indicates "strongly disagree" and 5 indicates "strongly agree."

The fourth section of the survey encompassed demographic information about the respondents, including gender, age, education level, occupation, monthly income, and per capita expenditure for the current visit. The survey questionnaire was translated from the original scale into Chinese, with some modifications made in terms of wording and format.

4. Research Results and Discussions

4.1. Results

4.1.1. Sample Characteristics

By analyzing the basic individual information of the subjects, it can be observed that in terms of gender, the male population accounts for 54.89% of the subjects, while females make up 45.11%. This indicates a relatively balanced distribution of genders in the study. As for age, the age distribution is broad, covering individuals from under 18 years old to over 60 years old. The largest age group is 26-30 years old, representing 17.56%, followed by 18-25 years old at 23.33%. This suggests that the study encompasses

subjects from various age groups. Most of the subjects have received a college education, comprising 39.56%. The next highest education level is junior high school or below, accounting for 20.67%. This may imply that a significant portion of the study's subjects have a higher level of education. The income distribution of the subjects is relatively even, with the two largest groups being those with incomes below 3000 RMB (RMB is the abbreviation for Renminbi, which is the official currency of China) and in the 3000-5000 RMB range, each making up 26.00%. Regarding the average per capita restaurant consumption, 46% of the subjects fall within the 50-100 RMB range, which aligns well with the scope of this research.

4.1.2. Validity and Reliability of Measurements

Through reliability analysis of the full sample data for the research variables, it can be observed that the Cronbach's Alpha values for the six aspects of OD (Object Density), SC (Social Crowding), SE (Service Employee), OCI (Other Customers Influence), PT (Perceived Territoriality), and CB (Customer Behavior) are 0.750, 0.811, 0.858, 0.842, 0.879, and 0.854, respectively. All six dimensions of the research variables exceed 0.8 in Cronbach's reliability coefficient. When the Cronbach's reliability coefficient values are above 0.8, it indicates a high level of internal consistency among the measurement items within each research variable, and the reliability of the test or scale is very good. The data collection quality of the perception questionnaire meets the requirements for questionnaire testing and is suitable for further analysis (see Table 1).

Table 1. Cronbach alpha.

Variables	N of items	n	Cronbach α
OD	3	450	0.750
SC	4	450	0.811
SE	6	450	0.858
OCI	4	450	0.842
PT	3	450	0.879
CB	5	450	0.854

The validity of the questionnaire scale was assessed through factor analysis, encompassing both Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). The prerequisite for evaluating the questionnaire's validity through factor analysis is that the Kaiser-Meyer-Olkin (KMO) value should exceed 0.6, and the p-value should be less than 0.001 after factor extraction from the questionnaire data. These criteria indicate that the existing questionnaire data is suitable for examination using factor analysis. The KMO and Bartlett's test results for the questionnaire yielded a KMO value of 0.859, exceeding 0.7, and a p-value less than 0.001, indicating suitability for factor analysis to assess validity. This implies that the research data is conducive to information extraction, and the data's validity is robust. SPSS25 software was utilized for factor analysis using the maximum variance method rotation. Six common factors were extracted, including OD, SC, SE, OCI, PT, and CB. All factors had eigenvalues exceeding 1, and after rotation, the cumulative variance explained was 67.442%, surpassing 50%. This indicates excellent explanatory power of the scale with minimal information loss during the dimensionality reduction process for high-dimensional data. The exploratory factor loading matrix, which was made by orthogonal rotation, showed that acceptable convergent validity was shown when the factor loading coefficient for each measurement item was greater than 0.5, and very good convergent validity was shown when the coefficient was greater than 0.6. Furthermore, all measurement factor loadings for the variables within their respective dimensions exceeded 0.6, and no cross-loading phenomenon was observed (see Table 2). This confirms the excellent validity of the perception questionnaire scale used in this study.

Table 2. Validity analysis.

Items	Factor loadings							Communalities
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	
SE1	0.689	-0.034	-0.144	-0.157	0.036	-0.025	-0.143	0.544
SE2	0.753	-0.121	-0.096	-0.199	0.053	-0.011	-0.137	0.652
SE3	0.804	-0.090	-0.020	-0.079	-0.019	0.032	-0.050	0.665
SE4	0.746	-0.068	-0.157	-0.097	-0.061	-0.043	-0.037	0.602
SE5	0.725	-0.067	-0.205	-0.046	-0.052	-0.139	-0.053	0.599
SE6	0.712	-0.060	-0.165	0.059	-0.053	-0.172	-0.072	0.578
CB1	-0.075	0.724	0.133	0.080	-0.073	0.134	0.127	0.594
CB2	-0.166	0.771	0.168	0.073	-0.046	0.127	0.060	0.677
CB3	-0.127	0.815	0.119	0.043	-0.033	0.135	0.031	0.717
CB4	-0.091	0.747	0.100	0.131	-0.086	0.022	0.033	0.603
CB5	0.039	0.741	0.174	0.091	-0.056	0.038	0.149	0.616
OCI1	-0.117	0.206	-0.052	0.716	-0.005	0.162	-0.068	0.602
OCI2	-0.121	0.094	0.012	0.800	-0.014	0.205	0.156	0.731

Items	Factor loadings							Communalities
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	
OCI3	-0.124	0.097	0.027	0.835	0.070	0.164	0.090	0.762
OCI4	-0.088	0.021	0.068	0.807	-0.009	0.028	0.132	0.682
SC1	0.043	-0.113	-0.150	-0.017	0.715	-0.011	0.093	0.558
SC2	-0.071	-0.012	-0.120	0.059	0.719	-0.117	0.080	0.560
SC3	-0.037	-0.071	-0.057	-0.029	0.869	0.049	0.029	0.768
SC4	-0.023	-0.061	-0.088	0.019	0.842	-0.006	-0.010	0.722
PT1	-0.093	0.146	0.022	0.229	-0.040	0.826	0.177	0.798
PT2	-0.065	0.132	0.069	0.151	-0.059	0.868	0.061	0.810
PT3	-0.139	0.151	0.132	0.180	-0.002	0.831	0.131	0.800
OD1	-0.090	0.057	0.028	0.067	0.137	0.089	0.808	0.696
OD2	-0.131	0.181	0.031	0.116	0.040	0.084	0.745	0.628
OD3	-0.176	0.107	0.073	0.093	0.023	0.147	0.776	0.680
KMO	0.859							-
Bartlett's test of sphericity (Chi-square)	6202.920							-
Df	406							-
p value	0.000							-

4.1.3. Confirmatory Factor Analysis of Research Variables

4.1.3.1. Convergent Validity Analysis of Research Variables

Testing the Squared Multiple Correlations (SMC), Average Variance Extracted (AVE), and Composite Reliability (CR) of each dimension in the measurement scale. According to the convergent validity analysis of the research variables, the AVE (Average Variance Extracted) levels of the research variables are consistently above 0.5. This indicates a high level of internal consistency between the research variables and the latent factors they represent. The construction of the measurement model is highly reliable, and there is a strong relationship between the measurement items, which aids in accurately reflecting the theoretical structure of the study. Additionally, the AVE values for the research variables all exceed the commonly accepted threshold of 0.5, indicating that each measurement item of the research variables explains the variability of the latent factors it represents effectively (see Table 3).

Table 3. Convergent validity analysis.

Constructs	Std. factor loading	SMC	CR	AVE
OD3	0.746	0.557	0.751	0.502
OD2	0.675	0.456		
OD1	0.702	0.493		
SC3	0.849	0.721	0.819	0.535
SC2	0.616	0.379		
SC1	0.624	0.389		
SC4	0.807	0.651		
SE3	0.732	0.536	0.860	0.506
SE2	0.757	0.573		
SE1	0.68	0.462		
SE4	0.715	0.511		
SE5	0.712	0.507		
SE6	0.668	0.446		
OCI3	0.842	0.709	0.845	0.578
OCI2	0.809	0.654		
OCI1	0.659	0.434		
OCI4	0.718	0.516		
PT3	0.847	0.717	0.879	0.707
PT2	0.826	0.682		
PT1	0.85	0.723		
CB1	0.704	0.496	0.854	0.541
CB5	0.691	0.477		
CB4	0.675	0.456		
CB3	0.808	0.653		
CB2	0.791	0.626		

4.1.3.2. Discriminant Validity Analysis of Research Variables

The judgment of the scale's conceptual level is made by analyzing the square root of AVE (Average Variance Extracted) for the variables in this research scale and comparing it to the correlation coefficients between the research variables. The square root of AVE for each research variable is greater than the correlation coefficients between each research variable and other variables, indicating that this research scale exhibits good structural validity (see Table 4).

Table 4. Pearson correlation.

Variable	Mean	Std. deviation	OD	SC	SE	OCI	PT	CB
OD	2.599	0.645	0.502					
SC	2.651	0.705	0.116*	0.595				
SE	3.379	0.681	-0.303***	-0.021***	0.506			
OCI	2.408	0.882	0.270***	0.011*	-0.276***	0.578		
PT	2.994	0.914	0.313***	-0.068***	-0.248***	0.400***	0.636	
CB	2.447	0.898	0.274***	-0.167***	-0.254***	0.264***	0.324***	0.541

Note: * p<0.05, *** p<0.001.

4.1.4. Results of Testing Hypotheses 1 Through 9

In this study, path-influence relationships between variables were explored by constructing a hierarchical regression model. In Regression Model 1, consumer behavior was included as the outcome variable. The presence of sufficient and reasonable objective density (OD) in the restaurant has a big, positive effect on customers' plans to behave (B = 0.295***, p<0.001), which supports hypothesis H1. Social crowding in the restaurant (SC) negatively affects consumer behavioral intentions (B = -0.127*, p < 0.05), confirming hypothesis H2. The appropriate behavior of other customers in the restaurant (OCI) positively impacts consumer behavioral intentions (B = 0.328***, p < 0.001), validating hypothesis H3. The unreasonable intrusion of restaurant service employees (SE) negatively influences consumer behavioral intentions (B = -0.133*, p < 0.05), supporting hypothesis H4.

In Regression Model 2, territorial perception was included as the outcome variable. The objective density (OD) in the restaurant is adequate and reasonable, which has a significant positive effect on territorial perception (B = 0.287***, p < 0.001), supporting hypothesis H6. Social crowding in the restaurant (SC) negatively affects consumer territorial perception (B = -0.250***, p < 0.001), validating hypothesis H7. The appropriate behavior of other customers in the restaurant (OCI) positively impacts consumer territorial perception (B = 0.172***, p < 0.01), supporting hypothesis H8. The unreasonable intrusion of restaurant service employees (SE) negatively influences consumer territorial perception (B = -0.196**, p < 0.01), confirming hypothesis H9.

In Regression Model 3, compared to Model 1, territorial perception was additionally included. By observing the level of change in R² between Model 3 and Model 1, it is evident that, after including territorial perception, the positive effects of adequate and reasonable objective density (OD), social crowding in the restaurant (SC), the appropriate behavior of other customers in the restaurant (OCI), and the unreasonable intrusion of restaurant services employees (SE) on consumer behavioral intentions remain significant. This suggests that territorial perception plays an intermediary role in the relationship between the service context of territorial perception and consumer behavior (see Table 5).

Table 5. Model testing of mediation effects.

-	Model 1	Model 2	Model 3
	CB	PT	CB
Constant	2.610*** (7.534)	2.225*** (6.516)	2.211*** (6.188)
OD	0.287*** (4.432)	0.295*** (4.614)	0.234*** (3.585)
SC	-0.250*** (-4.510)	-0.127* (-2.323)	-0.227*** (-4.135)
SE	-0.196** (-3.204)	-0.133* (-2.216)	-0.172** (-2.839)
OCI	0.172*** (3.689)	0.328*** (7.138)	0.113* (2.333)
PT	-	-	0.179*** (3.784)
N	450	450	450
R ²	0.172	0.223	0.197
Adjust R ²	0.164	0.216	0.188
F	F (4,445)=23.047,p=0.000	F (4,445)=31.937,=0.000	F (5,444)=21.853,p=0.000

Note: * p<0.05 ** p<0.01 *** p<0.001.

4.2. Discussion

This study confirms that appropriate object density in the service setting has a positive effect on customers' territorial perception, while social crowding has a negative impact on customers' territorial perception. This suggests that having sufficient space on the tabletop, appropriate distance between tables and chairs, a non-overcrowded environment, and the ability for customers to move freely within the restaurant space contribute to a sense of comfort, undisturbed personal space, and fulfillment of privacy and belonging needs (Argo, 2020; Jeong, Kim, Ma, & DiPietro, 2022).

The research also affirms that unreasonable interference by service employees in the service setting has a negative impact on customers' territorial perception, while positive impressions of other customers have a positive influence on customers' territorial perception. This implies that during the dining process, actions such as hurriedly clearing tables, engaging in conversations within customers' territorial boundaries, over-serving, or other inappropriate service behaviors by employees can affect customers' territorial perception negatively (Ashley et al., 2020). On the contrary, friendly and appropriate behavior from other customers, along with pleasant emotions, not only contribute to a positive service experience for customers but also ensure that customers have undisturbed personal space, positively influencing their territorial perception (Locander, White, & Newman, 2020).

Furthermore, the study establishes that adequate object density in the service setting has a positive impact on consumer behavior (Morkunas & Rudienė, 2020), while social crowding has a negative influence on consumer behavior (Thomas & Saenger, 2020). This underscores that external factors such as appropriate physical space, including suitable spatial distances and proper foot traffic, directly and positively affect customers' willingness to consume. This finding further supports the idea that there is a crucial connection between environmental cues and behavioral (Trudel, 2019).

The research also confirms that unreasonable intrusion by service employees in the service setting negatively affects customer behavior, while positive impressions of other consumers have a positive impact on customer behavior. This suggests that appropriately restrained service interventions by employees and other customers' well-mannered behavior positively contribute to an overall positive perception of the service setting, prompting customers to engage in positive consumption behaviors, such as actively recommending the restaurant to friends and displaying loyalty by spending more time and money at the establishment (Otterbring, 2023).

Finally, the study establishes a positive impact between customers' territorial perception and behavior. Consistent with previous research, there is a positive impact between customer perception and behavior (Kusumawati & Rahayu, 2020). This indicates that when customers perceive sufficient physical and psychological safety and control over their dining space, they exhibit higher levels of territorial perception. As a result, customers engage in positive behaviors, actively recommending the restaurant to friends and willingly spending more money and time at the establishment. Thus, there is a close relationship between territorial perception and customer behavior.

5. Conclusions and Implications

In this study, perceived territoriality is introduced as an intermediary variable in the mechanism of service environment effects. When customers enter a service location, they will holistically perceive various territorial cues within the environment, resulting in an overall impression of the service environment. This, in turn, affects customers' territorial cognition, which refers to the degree to which an individual feels they have their own space (perceived territoriality). When entering the service scene, the customer experiences a thorough territorial perception and impression that is solely based on an integrated perception of territorial elements within the service environment and is unaffected by other location-related factors. Subsequently, through this perception and judgment, it leads to consumers' approach or avoidance behavior (behavioral intention). Overall, our empirical results support all our hypotheses, namely, that territorial elements within the service environment influence consumer behavior through customers' territorial perception, thus confirming the importance of enhancing the service environment to guide more positive customer behaviors.

5.1. Theoretical Implications

Firstly, this study has refined the indicators for territorial factors in the casual dining restaurant servicescape. Prior to this research, only a few scholars had studied the classification system of servicescape, and even fewer had focused specifically on the servicescape factors of casual dining restaurants. Drawing upon previous research, this study has derived classification indicators for territorial elements in casual dining settings, aiming to make a breakthrough in the theoretical study of territorial factors in such servicescape.

Secondly, an empirical method was employed to establish a model of how the servicescape in a casual dining restaurant affects customer behavior. Through a literature review, surveys, and empirical research methods, this study has identified the basic patterns of how the servicescape in casual dining settings influences customer territorial perception and consumer behavior, providing insights into the construction and management of casual dining servicescape.

Lastly, this research applied the concept of territorial perception to the S-O-R model. Although Bitner (1992) initially proposed that emotional responses would influence the relationship between the service environment and customer behavior, past research has mainly focused on the impact of environmental stimuli on customer emotions. The findings of this study indicate that territorial perception is a crucial element in the S-O-R model. Many servicescape elements, such as visual stimuli, design factors, service employees, and other customers, influence customer purchasing behavior by affecting territorial perception. This deviates from prior research that perceived the impact on customer purchasing behavior to stem solely from the emotional pathway, thereby underscoring the significant role of territorial perception.

5.2. Managerial Implications

To better provide valuable suggestions for managing the servicescape of casual dining restaurants, this study, combined with the conclusions from the empirical research, proposes management insights for casual dining restaurants from various perspectives.

The study shows that the servicescape significantly affects both customers' territorial perception and their approach behavior, and both effects are strong. Proper management of the servicescape not only promotes customer approach behavior but also elicits a high sense of territorial perception among customers. Therefore, when casual dining restaurants plan the overall servicescape, design functional layouts, and consider social interactions, they should take into account both the psychology and behavior of the customers.

Given the conclusion that physical density significantly affects customers' territorial perceptions, casual dining service enterprises should emphasize the spacing of tables and chairs and the placement of tabletop items to enhance customers' territorial perceptions. In light of the finding that social crowding factors significantly affect customers' territorial perceptions, service enterprises should design the layout of corridors and functional spaces to make customers feel comfortable and ensure they don't feel their personal space is invaded. A clear orientation purpose should be established to make customers feel they can control their dining space effortlessly, preventing any negative emotions. Considering the finding that staff disturbances significantly affect customer approach behavior, casual dining service enterprises can enhance the training and management of service employee to provide customers with a satisfying dining experience. Through reasonable and smooth interactions between the service employee and customers, customer approach behavior can be enhanced. Addressing the finding that appropriate behavior from other customers significantly affects customer approach behavior, casual dining restaurants can manage customer behavior appropriately, such as calming customers when necessary, reminding them about dress codes, hogging behaviors, queue jumping, noise-making, or rude behavior, thereby promoting positive consumer behaviors.

6. Limitations and Future Research

This study limits its scope to casual dining restaurants, ensuring consistency in the research context. However, the generalizability of the conclusions derived from this research to other consumer service industries requires further validation.

This study adopts the classification that Rosenbaum and Montoya (2007) proposed for classifying territorial elements in the servicescape. However, there are numerous elements related to territoriality in servicescape, and the current research in this field is not exhaustive. There remains ample opportunity for further exploration and development, emphasizing the need for future studies to delve more comprehensively into territorial factors within service contexts.

The research has limitations in customer segmentation. The focus of this study is to consider the impact mechanism of servicescape on territorial perception and customer behavior from the customer's perspective. However, since customer behavior is a multifaceted social phenomenon, businesses and customers are not the only ones who can influence it. They could also be influenced by various factors, such as cultural, individual, and situational differences. Especially when studying territorial perception, different cultures can influence the scale of perceived territory, which in turn can significantly determine customer behavior. This is an aspect worthy of in-depth exploration in future research.

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