

Research Paper

How can the solo dining experience be enhanced? Focusing on perceived territoriality

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ABSTRACT

Europe, Australia, the United States and now Asia have documented recent increases in numbers of “solo” consumptive restaurant dining behavior, representing an emerging worldwide restaurant industry trend. The study’s objectives were designed to explore uncharted solo dining research addressing perceived territoriality as a theoretical foundation for identifying potential physical and psychological boundaries applied to the solo dining context and for examining the relationships between those boundary factors, solo diners’ perceived territoriality, overall satisfaction and revisit intentions. Results showed that restaurant physical and psychological boundaries positively influenced perceived territoriality, leading to positive solo dining satisfaction and revisit intention. Further, this study revealed that solo diners’ motivations significantly moderated the effects of psychological boundaries upon their perceived territoriality. Implications and recommendations for future research are provided.

1. Introduction

Demographic shifts, changes in family structure and the growing influence of modern lifestyles have created new consumer behavior issues such as solo traveling and solo dining (Bianchi, 2016). As an example, the recent increase in numbers of single-person households, combined with hectic work schedules and more time being spent outdoors, have contributed to forming this new trend representing “solo” consumptive behavior (Hall, 2017).

At about the time the new millennium began, solo dining became socially acceptable in all cultures, and it now represents an emerging restaurant industry trend worldwide (Hall, 2017). One report by a global market research company documented that 30% of all total European restaurant guests were solo diners (AFP, 2017). This same report further indicated that although numbers of restaurant guests in Europe dropped by three percent over the most recent five-year timeline, numbers of solo diners increased by nine percent, representing 138 million more solo restaurant visits. An Australian-based market research company specializing in the restaurant industry reported that 40 percent of online restaurant bookings reflected solo diners (Cloros, 2018). Numbers of solo diners have also been increasing in the United States (Shalhoub, 2018). In recognition of this, Amanda Cohen, a world renowned New York City-based chef and restaurateur, created a local celebration entitled ‘Solo Diners Eat Out Week’ to promote the

importance solo diners have upon the industry. This highly successful event rapidly gained national attention and now is an annual national restaurant event in the United States (Carlo, 2018).

The Asian dining culture, which is based upon a family-oriented philosophy, has historically regarded solo dining as being taboo (Geng, 2014). However, in today’s modern Asian society, dining alone has become more acceptable, which is especially true in South Korea (Choon, 2016). The Korea Rural Economic Institute recently conducted a national consumer behavior food survey involving interviews with 5,983 residents and reported that 89.2% of all respondents dined out alone during 2017 (Korea Rural Economic Institute, 2017). Another survey conducted by the state-run Korea Agro-Fisheries & Food Trade Corporation validated the rising trend in solo dining based on statistical data obtained from 3,014 South Koreans (Nam, 2019). Results of this survey reported that consumers dine out 13.7 times each month, with solo dining representing about 26% of these occasions. In response to this rising solo dining trend, restaurants have addressed restructuring the physical dining environment to create a more comfortable and convenient atmosphere to attract and increase solo diner visits (Superior Seating, 2018).

Accordingly, scholars have begun to explore relevant issues addressing the negative aspects of solo dining experiences. Stress was identified as one negative outcome caused by feelings of being isolated from others when dining in public space compared to those dining

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experiences shared with others. For example, [Her and Seo \(2018\)](#) found that anticipated loneliness and the perception of receiving negative evaluations from other groups of diners significantly reduced solo dining intentions when other groups of diners were seated too closely to them. [Hwang et al. \(2018\)](#) demonstrated that close proximity with other diner groups negatively influenced solo dining enjoyment. Accordingly, personal space associated with table distance became a critical determinant of solo diners' experiences. However, due to physical limitations associated with creating restaurant space, actual distance between tables for accommodating the needs of solo diners could be possibly harmful for restaurant profitability, as it could significantly reduce the total numbers of available seats, thus removing opportunities for revenue generation. Nonetheless, no existing literature has addressed alternative tactics to overcome this tradeoff between solo dining experiences and restaurant revenue strategies.

Therefore, this study focused on identifying effective ways to improve solo dining experiences considering challenges associated with layout and design of restaurant dining environments. In doing so, our focuses were on two theoretical propositions. First, privacy regulation theory by [Altman \(1977\)](#) proposed that individuals attempt to possess and control over the territory in shared space using both physical and psychological boundaries for them to ultimately achieve perceptions of privacy. Our study's second theory was based upon human territoriality theory ([Sack, 1983](#)) which provided implications that users' space-related satisfaction depends on the degree of their perceived territoriality and defined perceived ownership about a specific space even when all individuals were assigned equal amounts of space. Supporting these propositions, prior literature has documented the importance of well-established physical and psychological boundaries to foster space users' perceived territoriality ([Chung, 2000](#); [İmamoğlu and Gürel, 2016](#)). Subsequently, this study hypothesized that well-structured restaurant physical and psychological boundaries may be able to lead to solo diners' high perceived territoriality, which in turn could improve their satisfaction and revisit intentions. This study also expected that such hypothesized relationships may be affected by solo diners' motivations due to prior research findings that support dining motivations as being critical factors in determining dining experiences ([Jin et al., 2012](#)).

Thus, the study's objectives were developed to: (a) identify potential physical and psychological boundaries that can be used in the solo dining context, (b) examine how those boundary factors influence solo diners' perceived territoriality, (c) investigate how their perceived territoriality affects solo dining satisfaction and revisit intentions, and (d) determine the moderating effects of solo diners' motivations upon the relationships between restaurant physical and psychological boundary factors and their perceived territoriality.

2. Theoretical framework and hypotheses

2.1. Perceived territoriality based on human territoriality theory

Prior literature has focused on the individuals' feelings and perceptions of possessiveness towards the specific space (i.e., campground) they occupy because they were found to be determinants of future choices regarding the reuse of services and facilities in recreational settings ([Peterson et al., 1985](#)). This concept was based on [Sack \(1983\)](#) proposing what became known as human territoriality theory in order to better understand why people are to defend/or occupy a specific area and attempt to maintain control over that area. [Sack \(1983\)](#) defined territoriality in more specific terms as an assertion of control over a geographic area developed through various forms of classification and assignment, assuring exclusive possession and control of personal space. [Sack \(1983\)](#) also proposed that people having perceived and well-established territoriality are likely to feel secure and satisfied in a shared space, which further develop the spatial perspective for more frequent use of that space.

This relevant issue was also addressed in a 1984 study by Normoyle

and Lavrakas that sheds light upon people's territoriality behavior, which represents the human tendency to identify ownership towards a certain area and exclude others from their personal territory. Accordingly, the same authors conceptualized "perceived territoriality" to be an individual's perceptions about their exclusive right to use a specific space (i.e., house, land and designated parking areas). This concept was more precisely discussed in research findings regarding residential communities that documented perceived territoriality as being formed based upon individual perceptions of possession towards personal space ([Chung, 2000](#)). As a result, perceived territoriality was operationalized as being an individual's perceptions about occupation and control over their own particular space ([Chung, 2000](#)).

Because perceptions of territorial space owned by users are recognized as a critical factor for determining satisfaction and intention to reuse, perceived territoriality has been examined within the context of several different applications including residential dormitories ([Abu-Obeid and Ibrahim, 2002](#)) and public library environments ([İmamoğlu and Gürel, 2016](#)). The importance of identifying effective solutions to improve users' perceived territoriality was highlighted for providing desirable experiences in using facilities and space. Several studies in various tourism settings adopted the concept of perceived territoriality as a theoretical research foundation to understand its effects on visitor experiences and satisfaction specific to boating tours ([Andereck, 1997](#)) and fishing ([Wickham and Graefe, 2002](#)). A more recent study by [Kumar and Nayak \(2019\)](#) described perceived territoriality as the visitors' sense of psychological ownership towards a destination, and found that it led to more positive effects on tourists' intentions to revisit and recommend India.

In recognition of these positive roles of perceived territoriality upon users' experiences and satisfaction towards places or spaces, scholars have also investigated how to create the desirable atmosphere and environment of space. Several studies raised the issue regarding the fact that users taking the same amount of space reported significantly different levels of perceived territoriality ([Abu-Obeid and Ibrahim, 2002](#); [İmamoğlu and Gürel, 2016](#)). In response to this finding, these studies concluded that an individual's perceived territoriality depends upon both the degree of physical space separation from others and the degree of psychological desire to obtain a preferred level of privacy.

2.2. Physical and psychological boundaries based on privacy regulation theory

Human territoriality theory by [Sack \(1983\)](#) stated that territoriality could be possibly created by several important factors such as clearly defined ownership (i.e., using marked or signed boundaries and statements about possession or exclusions) and psychological emotions (i.e., being confident in controlling things in space). This implies that space users tend to set and establish their own territory using various physical and/or psychological boundary factors because they feel more relieved from any conflicts over shared spaces and intrusion by others.

Privacy regulation theory by [Altman \(1977\)](#) explained how to achieve privacy in shared spaces and focused on individuals' attempts using physical withdrawal and psychological barriers to occupy and maintain a certain space from others and ultimately achieve privacy. In the same literature, physical boundaries exemplified the existence of high walls and doors, while invisible or psychological boundaries surrounding an individual represented affective expression, emotional attachment to the space and belongingness to the community.

[Chung \(2000\)](#) turned her attention to the importance of strategy development to improve perceived territoriality in the residential environment through well-defined physical and psychological boundaries. [Rashid and Zimring \(2005\)](#) also highlighted that a well-designed structure of physical and psychological boundaries contributes to establishing users' control over public space. Relevant factors related to applicable physical and psychological boundary settings have been widely studied for adoption in different settings. For example, [Rashid](#)

and Zimring (2005) introduced various forms of physical boundary factors (i.e., square footage, number of panels, panel heights, and additional partitions) applied to the office environment. A restaurant study by Robson (2002) found that table and seat configurations were critical physical factors in assisting guests to defend their personal territory, and feeling less intrusion by others. Gharaei et al. (2012) focused on socio-cultural conditions as psychological factors and found their significant roles in improving city park users' privacy.

2.3. Physical and psychological boundaries and solo diners' perceived territoriality

This study posited that perceived territoriality would play a significant role in determining the solo dining experience, and thus, focused on identifying applicable factors to form physical and psychological boundaries, applied to a restaurant setting based upon human territoriality theory (Sack, 1983) and privacy regulation theory (Altman, 1977). Recent solo dining literature found that "spatial closeness" with others led solo diners to perceive high levels of crowding, which negatively impacted their overall dining experience (Her and Seo, 2018; Hwang et al., 2018). This finding is in line with previous literature addressing appropriate restaurant table space issues (Robson et al., 2011). It provided a serious warning to restaurant revenue managers that focused only on maximizing restaurant capacity through tight table arrangement. Responses obtained by diners at closely spaced tables reported low privacy and high stress, resulting in low intention to revisit. In consideration of this finding and also in conjunction with the growing trend for solo dining in public facilities, distances between tables and chairs should be configured for providing ideal dining space to solo diners. Thus, this study expected that 'inter-table distance' might be one critical physical boundary factor in determining solo diners' perceived territoriality.

In an effort to identify another form of physical boundaries in the solo dining context, this study focused on Kim and Kim (2015) addressing how to establish residents' perceived territoriality related to public space design in a housing complex. It was revealed that when common spaces such as parking lots, garages and gardens were designed for 'exclusive use' representing a jurisdiction for an individual's possessed territory, this situation greatly improved residents' perceived territoriality. Yifei and Qiong (2019) has also addressed restaurant design changes to accommodate growing numbers of solo diners by adding small shelves at table stations where cutlery, condiments and sauces can be easily stored and used only by solo diners at those specific locations. Since it is common in some countries that restaurants do not place napkins, silverware or condiments on all of the tables, diners must ask other guests eating next to them to pass over what they need. Thus, when each table has its own bowls/dishes, silverware, napkins and condiments, it allows solo diners to use those items exclusively, which further helps increase their perceived territoriality. Thus, this study expected to find that 'exclusive use' may be another important physical boundary factor and the following hypotheses have been developed as follows:

H1. Sufficient inter-table distance has a positive effect upon solo diners' perceived territoriality.

H2. Exclusive use has a positive effect upon solo diners' perceived territoriality.

Lahad and May (2017) analyzed 200 media texts about solo dining experiences posted by female solo diners during a 2-year period (2014–2016). The analysis found that because diners are generally required to be 'with' others, appearing to be alone in restaurants makes solo diners feel uncomfortable and excluded from group guests. Because of this, they stressed the importance for solo diners to have a sense of belonging and especially for less experienced solo diners to have a feeling of being at home within a restaurant. Thus, our attention has

focused upon the concept of 'place attachment,' defined as a bonding between an individual and a specific place, and ultimately resulting in the creation of feeling comfortable in a place (Line et al., 2018). Our position can be supported by Andereck (1997) confirming that visitors having high place attachment perceived less crowding and more territoriality in a tourism destination. Place attachment is commonly conceptualized using two dimensions and is widely accepted in the research fields of both environmental psychology and tourism management (Williams and Vaske, 2003; Kyle et al., 2004; Reineman and Ardoin, 2018): 1) 'place dependence' reflecting how well a place provides features and conditions that assist individuals' goal achievement or desired activities (Jorgensen and Stedman, 2001), and 2) 'place identity' presenting self-identity that increases an individual's sense of belonging to a specific place (Kyle et al., 2004).

In recognition of important roles of place attachment in forming the consumption atmosphere in shared environments, many scholars identified the positive effects of place attachment upon consumer perceptions and experiences. For example, Kyle et al. (2004) found that recreationists having high place attachment tended to favor "setting density" referring to numbers of other users in a particular place along the Appalachian Trail in the U.S. and place dependence particularly decreased perceived crowding more significantly than place identity. Line et al. (2018) addressing place attachment empirically demonstrated that diners having high attachment to a restaurant were inclined to have developed a quality relationship with the restaurant, leading to positive perceptions about the dining environment such as feeling proud and/or comfortable with being in the facility. Following this, we assumed that having place attachment which includes 'place dependence' and 'place identity' could be essential factors of psychological boundaries to improve solo diners' perceived territoriality. Thus, the following hypotheses were developed:

H3. High place dependence has a positive effect upon solo diners' perceived territoriality.

H4. High place identity use has a positive effect upon solo diners' perceived territoriality.

Takeda and Melby (2017) explored solo dining experiences in conjunction with social and cultural associations using in-depth interviews with 72 adults aged 20–40 years old in Australia and Japan. They found that both Australian and Japanese participants expressed their solo dining experience as being stressful due to scrutinizing gazes from other diners. Consistently, Lahad and May (2017) addressed similar issues regarding solo dining experiences. They asserted that solo dining could draw curious stares from other group guests, and especially in the case where there were only a few solo diners in restaurants whom were surrounded by groups of diners. This situation could possibly make solo diners feel highly exposed and embarrassed, and lead to high perceived invasions of privacy. Wilson (2004) also reported that when solo travelers perceive unwanted attention from other group travelers, they felt less travel freedom, sense of personal space, ease of movement and access to places in the travel destination. Thus, we assumed that 'uncomfortable gazes from others' could significantly decrease solo diners' perceived territoriality and was expected to represent another important psychological boundary factor. Thus, hypothesis 5 was proposed as follows:

H5. Uncomfortable gazes from others have a negative effect upon solo diners' perceived territoriality.

2.4. Solo diners' perceived territoriality and their satisfaction and revisit intention

Sack (1983) proposed that perceived territoriality can be an important determinant of space users' satisfaction and reuse intention. Supporting this, Abu-Obeid and Ibrahim (2002) suggested that

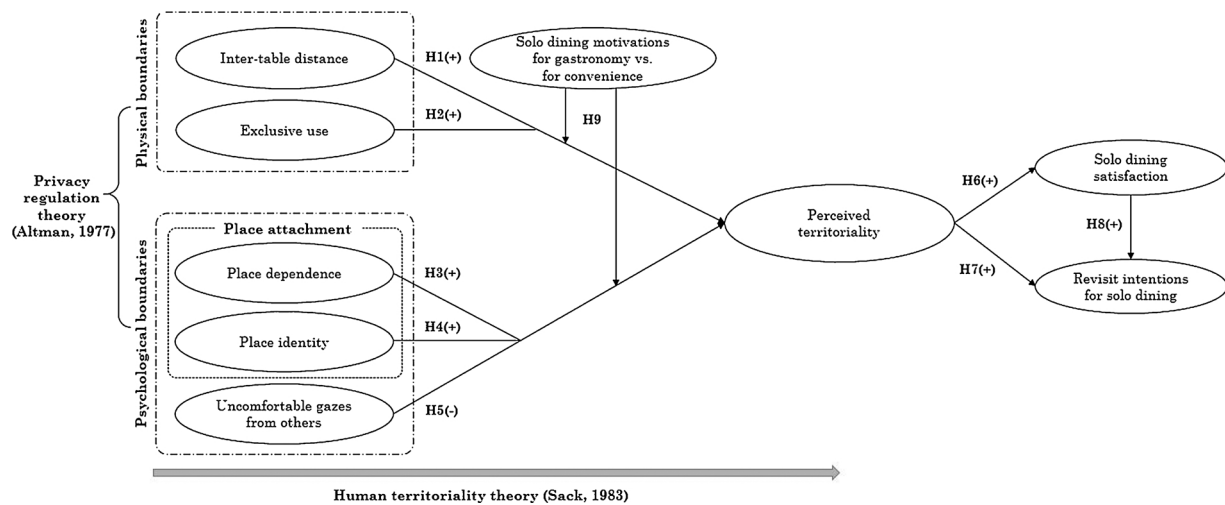


Fig. 1. Research framework.

dormitory residents' perceived territoriality would be essential to improve their satisfaction. Wu et al. (2014) empirically demonstrated that coffee shop consumers sharing a table with others who perceived less possessive territory, reported high perceived crowding and ultimately negative appraisals about their satisfaction and service experience. Kumar and Nayak (2019) found a positive relationship between visitors' perceived territorial ownership towards a destination and their intentions to revisit and recommend. Additionally, it has been commonly demonstrated that satisfied consumers are more likely to have high return intention and remain patronized (Ha and Jang, 2010). Thus, this phenomenon was expected to be observed in the study context regarding solo dining and the following hypotheses were developed:

H6. Solo diners' perceived territoriality has a positive effect upon their satisfaction.

H7. Solo diners' perceived territoriality has a positive effect upon their revisit intention.

H8. Solo diners' satisfaction has a positive effect upon their revisit intention.

2.5. Solo dining motives and their moderating effects

Because consumer motivations are recognized as being critical factors that influence their perceptions and evaluations about products and service, studies attempted to better understand what motives make differences in consumption patterns (Park, 2004; Jin et al., 2012). Given the rising trend in solo dining behavior, several studies explored major motivations for solo dining. For instance, Danesi (2012) conducted 45 in-depth interviews to identify solo dining motives. Results showed that people dine solo for the purpose of being able to fully focus on what they want to eat and enjoy without being distracted by others, or they eat alone because their working schedule or living arrangement required negotiation and adaptation with others. Adopting the same premise, Takeda and Melby (2017) identified that solo diners are motivated by the opportunity to explore new food and restaurants without the need to be concerned about others. They also discovered that people dine solo to save time due to the ease of being seated and timing related to convenience and efficiency. Likewise, solo dining motives have been approached by adopting the two-dimensional hedonic and functional dimensions including 1) a 'desire for gastronomy' and 2) a 'desire for convenience.'

Jin et al. (2012) highlighted the importance of identifying consumer motivations by demonstrating that diners' motivations (hedonic vs. functional) significantly moderated the effects of food quality and

physical surroundings upon their perceptions about the restaurant's brand image. Han and Kim (2017) demonstrated the significant role of consumer motivations upon the relationships between consuming environments and their perceived crowding. More specifically, it was found that a world travel fair's attendees and their motivations (knowledge-seeking or socializing) significantly moderated the effect of the exhibition servicescape upon their perceived crowding. These results implied that solo dining motivations could possibly have a moderating effect upon the relationships between restaurant dining environments and their perceived territoriality (see Fig. 1). Thus the following hypothesis was proposed:

H9. Solo diners' motivations (desire for gastronomy or for convenience) moderate the effects of restaurant physical and psychological boundary factors upon their perceived territoriality.

3. Method

3.1. Data collection and sampling

A pilot test using 100 solo diners selected conveniently from five Korean casual dining restaurants was performed to check for any ambiguous measures and to ensure the reliability of scales. Through the pilot test procedure, several of the survey's statements were revised to improve clarity. The main survey was conducted using consumers who dined out alone at casual restaurants located in the two South Korean metropolitan cities of Seoul and Gyeonggi, during April and May 2019. This study specifically limited data collection to include only solo diners who had eaten out at casual-dining restaurants that provided table service. Another criterion for data collection was that restaurants offered entree items ranging between \$7.50 and \$10 USD.

Data were collected using two different methods including: 1) on-site restaurant interviews with randomly selected solo diners at the conclusion of a solo dining experience and 2) randomly selected solo diners who were given an online survey link at the conclusion of their dining experience to complete and electronically submit. Respondents were guaranteed confidentiality and that all responses provided would not be able to be identified with any particular respondent. An incentive equal to 20 percent off of selected menu items was provided to all individuals completing the survey. Using these two data collection methods, 422 respondents participated in the survey and 12 responses were excluded due to incomplete or inappropriate answers. As a result, a total of 410 responses used for the study's data analysis were obtained by on-site interviews (n = 103) and from electronically submitted survey responses (n = 307). Due to two different data collection

methods, this study investigated if there were any significant differences in mean values of all measurement items offered between the two different data collection methods (Hamister and Fortsch, 2016). Results of t-tests revealed that no significant differences in response mean values ($p > 0.05$) were detected between those two methods.

Common method bias was tested to determine if individuals provided consistent responses across all survey items for the self-reported and cross-sectional data collection methods used. Harman's single-factor test was conducted with the conditions of an eigenvalue greater than 1.0 and no rotation for one-factor extraction (Podsakoff and Organ, 1986). Results showed that the one-factor extraction solution explained 39.52% of the total variance, being less than 50%, which concluded that common method bias was not a serious concern within the study's data (Dhar, 2015).

3.2. Survey instrument and measures

The survey instrument consisted of six sections. Section 1 was developed to measure respondents' perceptions of restaurant physical ('inter-table distance' and 'exclusive use') and psychological ('place dependence,' 'place identity' and 'uncomfortable gazes from others') boundary factors regarding their solo dining experience. The construct of 'inter-table distance' was measured using three items adapted from Hwang et al. (2018). Also, three items for 'exclusive use' were adapted based on Kim and Kim's (2015) study and were modified within the context of the solo dining restaurant experience. The two dimensions of place attachment, 'place dependence' and 'place identity' were measured by employing six items (three items per each construct). The measures of 'place dependence' and 'place identity' were adapted based on prior literature (Line et al., 2018; Hallak et al., 2012). The last psychological boundary factor represented 'uncomfortable gazes from others', and was assessed using three items based on Her and Seo's (2018).

Section 2 of the survey instrument was developed to assess 'perceived territoriality' using four items adapted from research by Normoyle and Lavrakas (1984); and Wu et al. (2014). Section 3 assessed 'satisfaction with the solo dining experience' and Section 4 evaluated 'revisit intention to dine alone'. Each of these sections used three statements unique to satisfaction and revisit intention based upon research conducted by Ha and Jang (2010); and Her and Seo (2018). Section 5 was designed to identify respondents' solo dining motives. Three items were used to measure the gastronomy motive for solo dining (Danesi, 2012; Jo and Cheon, 2018). Also, three additional items were developed to assess the convenience motive for solo dining (Takeda and Melby, 2017; Jo and Cheon, 2018). A 7-point Likert scale (1 = 'strongly disagree' and 7 = 'strongly agree') were used to measure all of the study's scales.

Section 6 of the survey included respondent's socio-demographic (gender, age, marital status, education level, occupation, and monthly income) characteristics and dining-out patterns (frequency of dining out, frequency of dining out alone, and menu item types provided for solo dining). The first version of the survey questionnaire was developed in Korean by translating the original scale items that this study adapted. Through this translation process and also as a result of the pilot test, some changes and modifications in wording and format were made to the final Korean version of the survey questionnaire. This final questionnaire was translated back to English and its adherence to the original survey items were verified by Korean and American professors in hospitality programs.

4. Results

4.1. Sample characteristics

Table 1 presents the study respondents' socio-demographic characteristics and dining-out behavioral patterns. Respondents included

Table 1
Socio-demographics and dining-out behavioral characteristics of solo diners.

Characteristics	n (%)	Characteristics	n (%)
<i>Gender</i>		<i>Monthly income</i>	
Male	268 (65.4%)	< \$2,000	111 (27.1%)
Female	142 (34.6%)	\$2,000–\$3,000	162 (39.5%)
<i>Age</i>		\$3,001–\$4,000	69 (16.8%)
20–29	126 (30.7%)	\$4,001 ≥	68 (16.6%)
30–39	100 (24.4%)	<i>Weekly dining out frequency</i>	
40–49	72 (17.6%)	1–2 times	190 (46.3%)
Over 50	112 (27.3%)	3–4 times	123 (30.0%)
<i>Marital Status</i>		5–6 times	69 (16.8%)
Unmarried	207 (50.5%)	More than 7 times	28 (6.8%)
Married	203 (49.5%)	<i>Weekly solo dining frequency</i>	
<i>Educational level</i>		1–2 times	303 (73.9%)
High school	111 (27.1%)	3–4 times	62 (15.1%)
2-year college	89 (21.7%)	5–6 times	31 (7.6%)
University	188 (45.9%)	More than 7 times	14 (3.4%)
Graduate school	22 (5.4%)	<i>Food type for solo dining</i>	
<i>Occupation</i>		Korean	301 (73.4%)
Manager	115 (28.0%)	Japanese	48 (11.7%)
Professional	87 (21.2%)	Western	24 (5.9%)
Other	64 (15.6%)	Chinese	20 (4.9%)
Student	54 (13.2%)	Vietnamese	9 (2.1%)
Sales	29 (7.1%)	Fusion	8 (2.0%)
Self-employed	26 (6.3%)		
Housewife	24 (5.9%)		
Unemployed	11 (2.7%)		

more males (65.4%) than females (34.6%), and represented a broad range of age groups with those being between 20 and 29 years old representing the largest category (30.7%). This was followed by age groups representing individuals being over 50 years of age (27.3%) and those between 30 and 39 years old (24.4%). Respondents could be described as being unmarried (50.5%), and having earned a 2-year college degree or university degree (67.6%). Monthly income levels ranged between USD \$2,000 and \$3,000 (39.5%), followed by individuals earning less than \$2,000 (27.1%). Approximately one third (33.4%) of all respondents earned over \$3,000 per month. Respondents reported dining out up to 4 times a week (76.3%). Solo dining behavioral patterns reflected dining out up to twice a week (73.9%) for Korean food (73.4%). The next closest category of menu choice was Japanese food (11.7%).

4.2. Validity and reliability of measurements

Confirmatory factor analysis was performed to assess validity and reliability of the measurements used in this study (see Table 2). Results supported a good fit of the measurement ($\chi^2/df = 2.020$, $p < 0.001$, GFI = 0.912, NFI = 0.943, RFI = 0.930, TLI = 0.970, CFI = 0.970, RMSEA = 0.050) (Hair et al., 2009). Cronbach's α coefficients ranged from 0.820 to 0.939, supporting internal consistency among the measures within each construct (Nunnally, 1978). All standardized factor loadings were greater than 0.5, being statistically significant ($p < 0.001$). All values of average variance extracted (AVE) were greater than 0.5, and also all values of composite construct reliability (CCR) were greater than 0.7, supporting convergent validity and reliability of the measures (Fornell and Larcker, 1981).

Table 3 presents the means, standard deviations, and correlations between the eight constructs. Both restaurant physical environmental factors ('inter-table distance' and 'exclusive use') and both place attachment factors ('place dependence' and 'place identity') were found to be positively correlated with 'perceived territoriality,' 'satisfaction' and 'revisit intention.' Further, 'perceived territoriality' was positively correlated with 'satisfaction' and 'revisit intention.' However, 'uncomfortable gazes from others' was found to be negatively correlated with the other constructs.

Discriminant validity of the measurements was assessed using two

Table 2
Confirmatory factory analysis test results.

Constructs	Standardized factor loadings	CCR	AVE	Cronbach's α
Inter-table distance (ID)		0.843	0.654	0.820
ID1	0.893			
ID2	0.948			
ID3	0.516			
Exclusive use (EU)		0.849	0.654	0.842
EU1	0.772			
EU2	0.929			
EU3	0.710			
Place dependence (PD)		0.873	0.698	0.869
PD1	0.770			
PD2	0.871			
PD3	0.861			
Place identity (PI)		0.906	0.765	0.901
PI1	0.756			
PI2	0.943			
PI3	0.913			
Uncomfortable gazes from others (UG)		0.930	0.816	0.929
UG1	0.893			
UG2	0.942			
UG3	0.873			
Perceived territoriality (PT)		0.891	0.675	0.893
PT1	0.907			
PT2	0.944			
PT3	0.718			
PT4	0.687			
Solo dining satisfaction (SA)		0.935	0.828	0.935
SA1	0.886			
SA2	0.932			
SA3	0.911			
Revisit intention to dine alone (RI)		0.940	0.839	0.939
RI1	0.908			
RI2	0.937			
RI3	0.902			

Notes: $\chi^2/df = 2.020$ ($p < 0.001$), GFI = 0.912, NFI = 0.943, RFI = 0.930, IFI = 0.970, TLI = 0.964, CFI = 0.970, RMSEA = 0.050; CCR = composite construct reliability; AVE = average variance extracted.

methods. First, as shown in Table 3, the greatest correlation between the constructs was lower than all of the square roots of AVE for the corresponding inter-constructs (Fornell and Larcker, 1981). Second, confidence intervals of correlations between the constructs plus or minus two standard errors (i.e.: $-0.110 \sim 0.270$) did not contain the criterion of 1.0, confirming discriminant validity of the measurements (Hair et al., 2009).

4.3. Results of testing hypotheses 1 through 8

Structural equation modeling (SEM) was developed to test hypotheses 1 through 8 (see Fig. 2). Previous literature stated that individuals' perceived territoriality could possibly depend on personal

characteristics (Gharaei et al., 2012). Therefore, this study included respondents' socio-demographics and dining-out patterns in the SEM to control their potential impacts upon perceived territoriality. The fit indices of the SEM were acceptable ($\chi^2/df = 2.496$, $p < 0.001$, IFI = 0.932, TLI = 0.915, CFI = 0.931, RMSEA = 0.060) (Fornell and Larcker, 1981).

Regarding the effects of two physical environmental factors upon 'perceived territoriality,' results found that both 'inter-table distance' ($\beta = 0.328$, $p < 0.001$) and 'exclusive use' ($\beta = 0.092$, $p < 0.05$) had a significant and positive effect upon 'perceived territoriality.' Thus, hypothesis 1 and 2 were supported. Next, with respect to the effects of two psychological factors upon 'perceived territoriality,' both 'place dependence' ($\beta = 0.310$, $p < 0.001$) and 'place identity' ($\beta = 0.199$, $p < 0.001$) significantly and positively influenced 'perceived territoriality.' 'Uncomfortable gazes from others' ($\beta = -0.074$, $p < 0.05$) was found to significantly but, negatively influence 'perceived territoriality.' Thus, hypotheses 3, 4 and 5 were supported. Especially, path coefficients of the relationships tested for hypotheses 1 through 5 indicated that 'inter-table distance,' 'place dependence' and 'place identity' had the relatively greater effect upon 'perceived territoriality' when compared with 'exclusive use' and 'uncomfortable gazes from others.'

The relationships between 'perceived territoriality,' 'satisfaction' and 'revisit intention' were tested. Results supported our expectations to find the significant and positive effects of 'perceived territoriality' upon 'satisfaction' ($\beta = 0.636$, $p < 0.001$) and 'revisit intention' ($\beta = 0.180$, $p < 0.001$). A positive effect of 'satisfaction' upon 'revisit intention' ($\beta = 0.788$, $p < 0.001$) was also found. Thus, hypotheses 6, 7 and 8 were supported.

4.4. Results of testing hypothesis 9

Multi-group analyses were conducted to test hypothesis 9. A total of 410 respondents were asked to rate three items representing the motive to dine alone for 'gastronomy,' and to also rate three additional items representing the motive to eat out alone for 'convenience.' Two mean values for the solo dining motives were computed and then, compared with one another to classify respondents into either a 'gastronomy' or a 'convenience' motivation group. Among 410 responses, 53 respondents who reported equal values on the two solo dining motives were eliminated. Thus, a total of 357 responses were used for the multi-group analysis. A total of 149 respondents were categorized in the 'gastronomy' group due to their reported higher mean score for 'gastronomy' (5.10) than 'convenience' (4.14). Subsequently, the other 208 respondents were classified into the group named 'convenience' because they provided a higher mean score on the 'convenience' motive (4.91) compared to the 'gastronomy' motive (3.36). A measurement invariance test was conducted to confirm no significant measurement structure difference in responses obtained from the desire for gastronomy group and the desire for convenience group (Chen et al., 2005). Configural invariance was supported based on the appropriate fit to the data of the multi-group model ($\chi^2 = 885.9$, $df = 494$, RMSEA = 0.047,

Table 3
Discriminant validity and correlations.

	Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Inter-table distance	4.19	1.21	0.809^a							
(2) Exclusive use	4.75	1.38	0.388	0.809						
(3) Place dependence	4.21	1.26	0.392	0.354	0.835					
(4) Place identity	4.27	1.13	0.309	0.322	0.582	0.875				
(5) Uncomfortable gazes from others	2.89	1.34	-0.220	-0.173	-0.095	-0.071	0.903			
(6) Perceived territoriality	4.15	1.14	0.596	0.434	0.581	0.499	-0.244	0.822		
(7) Solo dining satisfaction	4.61	1.19	0.314	0.355	0.520	0.542	-0.328	0.649	0.910	
(8) Revisit intentions for solo dining	4.57	1.24	0.316	0.365	0.660	0.597	-0.252	0.633	0.841	0.916

Note: ^a Diagonals: Square root of AVE from the observed variables by the latent variables.

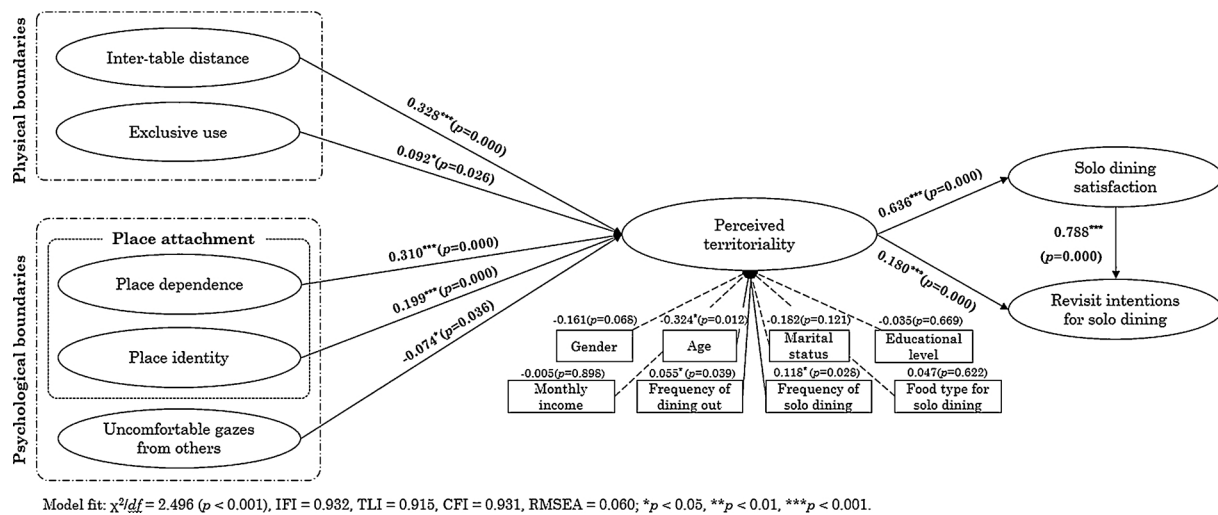


Fig. 2. Results of testing Hypotheses 1 to 8.

Table 4
Results of testing Hypothesis 9.

			Solo dining motivations				χ^2 difference	Supported
			For gastronomy (n = 149)		For convenience (n = 208)			
			Coefficient	C.R.	Coefficient	C.R.		
Inter-table distance	→	Perceived territoriality	0.756	3.807***	0.591	4.789***	$\Delta\chi^2$ (1) = 0.511, $p > 0.05$	No
Exclusive use	→	Perceived territoriality	0.036	0.389	0.111	1.874	$\Delta\chi^2$ (1) = 0.441, $p > 0.05$	No
Place dependence	→	Perceived territoriality	0.238	2.653**	0.494	5.735***	$\Delta\chi^2$ (1) = 3.952, $p < 0.05$	Yes
Place identity	→	Perceived territoriality	0.267	2.991**	−0.014	−0.180	$\Delta\chi^2$ (1) = 5.198, $p < 0.05$	Yes
Uncomfortable gazes from others	→	Perceived territoriality	0.010	0.134	−0.096	−2.001*	$\Delta\chi^2$ (1) = 1.323, $p > 0.05$	No

Baseline model fit: $\chi^2/df = 1.959$ ($p < 0.001$), IFI = 0.904, TLI = 0.879, CFI = 0.902, RMSEA = 0.052.

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

CFI = 0.948, TLI = 0.936). This configural invariance model was then compared with the full-metric invariance model. No significant difference in chi-square values between those two models ($\Delta\chi^2(25) = 24.9$, $p > 0.05$) was found, supporting the metric invariance.

Differences in path coefficients between the two motivation groups were tested by examining if a significant χ^2 difference between constrained and unconstrained models existed (see Table 4). χ^2 tests found no significant differences in the effects of 'inter-table distance' ($\Delta\chi^2(1) = 0.511$, $p > 0.05$), 'exclusive use' ($\Delta\chi^2(1) = 0.441$, $p > 0.05$) and 'uncomfortable gazes from others' ($\Delta\chi^2(1) = 1.323$, $p > 0.05$) upon 'perceived territoriality' between 'gastronomy' and 'convenience.' However, results showed that the effects of 'place dependence' and 'place identity' upon 'perceived territoriality' were significantly different between those two groups. More specifically, the effect of 'place dependence' upon 'perceived territoriality' was significantly greater in the convenience group ($\beta = 0.494$, $p < 0.001$) than in the gastronomy group ($\beta = 0.238$, $p < 0.01$), which was supported by the χ^2 test of difference ($\Delta\chi^2(1) = 3.952$, $p < 0.05$). Contrarily, the effect of 'place identity' upon 'perceived territoriality' was significantly greater in the gastronomy group ($\beta = 0.267$, $p < 0.01$) than in the convenience group ($\beta = -0.014$, $p > 0.05$), which was supported by the χ^2 test of difference ($\Delta\chi^2(1) = 5.198$, $p < 0.05$). Therefore, hypothesis 9 was partially supported.

5. Conclusions and implications

5.1. Theoretical implications

This study is the first attempt to apply the human territoriality theory (Sack, 1983) to a restaurant setting and especially to the solo

dining context. Additionally, we adopted the privacy regulation theory (Altman, 1977) and revealed that solo diners' perceived territoriality is created and fostered by not only those physical environment factors, but also by the guest's individual psychological boundaries. Although the importance of well-designed and established physical and psychological boundaries to provide private and satisfactory space has been recognized primarily in residential settings, this relevant issue has until now been ignored in the solo dining context. Thus, our findings contribute to the basis of theoretical development and applications to establish desirable dining environments and atmospheres for solo diners.

We successfully identified another important physical boundary factor, 'exclusive use' that can be easily applied to restaurant operations for solo diners along with 'inter-table distance' which has been widely addressed in the solo dining literature. This finding supported Chung (2000)'s theoretical position that clearly defined physical boundaries stipulating personal belongings and possessions could be most effective to improve space users' sense of territoriality.

Place attachment tested as psychological boundaries were found to positively improve solo diners' perceived territoriality. Numerous literature has investigated place attachment in various contexts including cafes (Tumanan and Lansangan, 2012), bars (McEwen, 2014), pubs (Sandiford and Divers, 2019) and restaurants (Line et al., 2018). All of these studies assumed the same position that the attachment consumers develop to foodservice establishments is a fundamental element leading to their frequent, regular or habitual visits.

Asatryan and Oh (2008) addressed psychological ownership representing a state in which individuals perceive that an object or target belongs to them within the context of restaurant consumers. They proposed that psychological ownership can be manifested when consumers perceive a restaurant as if it is "their," thus, leading to more

positive behavioral intentions. The authors also reported that fundamental human relationship factors (i.e., a sense of belonging, dependence or identification) representing attachment were important determinants of psychological ownership. In this aspect, [Asatryan and Oh \(2008\)](#) may provide more clear explanations of place attachment and its roles upon perceived territoriality. Solo diners having high place attachment could possibly develop high psychological ownership about the restaurant or the space where they are eating alone and are located within the restaurant, which also facilitates the development of perceived territoriality.

This study provided empirical support for different roles of place dependence and place identity upon perceived territoriality according to whether solo diners have a preference for gastronomy or for convenience. Findings indicated that when solo diners have a higher desire for gastronomy than for convenience, the impact of place identity upon their perceived territoriality became more significantly positive. In the opposite case of solo diners having a higher desire for convenience than for gastronomy, the impact of place dependence upon their perceived territoriality became more significantly positive. [Sirgy et al. \(1992\)](#) asserted that consumers seeking products reflecting their self-identity are more likely to purchase any products that can offer more experiential value. This position can be applied to solo diners who have a high desire for gastronomy. This gastronomy group may focus on fully experiencing what they are eating without being distracted by others. Thus, when solo diners have a high desire for gastronomy and have developed high place identity, they are likely to have a higher level of perceived territoriality. [Jorgensen and Stedman \(2001\)](#) stated that individuals' dependence on a certain place reflects its specific functions and conditions that satisfy individuals' needs and goals. Similarly, when people eat out alone to pursue convenience, they are more likely to choose a restaurant offering convenient services. Accordingly, when solo diners have developed place dependence towards the restaurant, they are more likely to perceive a high level of territoriality.

5.2. Managerial implications

Although 'inter-table distance' was found to be the most important boundary factor to improve solo diners' perceived territoriality, keeping sufficient inter-table distance for solo diners is not easy to be implemented because of the existence of tradeoffs between revenue and service strategies ([Robson et al., 2011](#)). Thus, we attempt to provide more useful implications for creating desirable dining physical environments by focusing on where to seat solo diners. [Han \(2018\)](#) conducted an explorative study about solo dining experiences in South Korea. She reported that solo diners preferred fixed tables to the wall or tables surrounding an open-kitchen because they could feel like they were sitting next to other solo diners and also were separated from group diners. She also reported that solo diners preferred small tables because they felt less burdensome for taking less space. Thus, fitting bar/counter seating and setting more small tables may be effective in both saving space between tables and improving solo dining experiences. As another example of creating desirable solo dining atmospheres, we focused on [Roetzel \(2017\)](#) addressing employees' perceptions about their assigned workplace. He found that suitable illuminance levels of lights and task area-focused lighting significantly improved their perceived ownership about the workspace. Likewise, arranging subdued lighting that provides cozy and warm feelings to solo diners can allow them to focus more on their meal rather than be bothered by other guests sitting closely to them. This may be extremely effective in improving solo diners' perceived territoriality.

How to improve solo diners' attachment towards a restaurant should be primarily focused on becoming the best and favorite choice of solo diners. This similar issue has been addressed by [Brocato et al. \(2015\)](#)

identifying distinctions as an essential determinant of place dependence. They stated that distinctions are judged by consumers and are formed by a comparison of differences between others. Restaurants should continuously improve their understanding of key services and benefits desired by solo diners, and further attempt to offer them to be distinct. For example, restaurants can offer time-limited menu items to encourage solo dining during off-peak time periods because solo diners tend to eat alone before or after peak time periods in order to avoid receiving attention from other dining groups ([Lahad and May, 2017](#)).

In particular, the effect of place dependence upon solo diners' perceived territoriality in the convenience motivation group was significantly stronger than in the gastronomy motivation group. Place dependence is typically formed based on a certain function of the enterprise that satisfy needs and goals of individual diners. Those functions are acquired based on the location's physical conditions such as ease of accessibility ([Reineman and Ardoin, 2018](#)). When applying this concept to the solo dining context, convenient accessibility can be achieved by not only physically close locations but easy and rapid service provision such as reservation systems, simply designed menu boards and the ability to self-order. These convenient services offered to convenience-seeking solo diners are expected to improve their place dependence towards the restaurant, and further increase high perceived territoriality.

Contrarily, the effect of place identity upon solo diners' perceived territoriality in the gastronomy motivation group was significantly stronger than in the convenience motivation group. [Kyle et al. \(2004\)](#) proposed that place identity representing emotional attachment to a certain place can be built by individuals who identify self-identity towards that place. Another study by [Line et al. \(2018\)](#) documented that when diners sensed that other guests in the same space shared similar demographic and psychographic characteristics, they reported high place identity towards the particular restaurant. [Han \(2018\)](#) reported that solo diners tend to visit a restaurant more frequently which they perceive to be more friendly and that they are familiar with because it engenders their sense of belonging and further, forms a better atmosphere for solo diners to fully enjoy the meals. Thus, a welcoming ambiance and interpersonal relationships through well-designed service employee training programs emphasizing great communication skills, courtesy and friendliness would be necessary to improve solo diners' place identity. Also, restaurants should educate their employees to guide solo diners to areas designed for individual diners, and separate from where groups of diners are eating to improve solo diners' perceived territoriality through their improved place identity.

6. Limitations and future research

Several study limitations will be addressed in order to direct future research to those specific areas needing more focus. First, this study obtained data restricted to consumer experiences at casual dining restaurants. Thus, other restaurant categories including fast food, quick-service cooked to order, and fine dining restaurants may involve solo dining guests that could possibly have different levels of expectations about dining environments from those examined in this study. Their responses to survey items could very well generate answers that would indicate other restaurant types affect the solo dining experience quite differently than did those obtained from casual dining establishments. Additionally, the geographical area used in this study was limited to several South Korean metropolitan areas. Thus, in order to determine if various cultural backgrounds can cause different perceptions related to solo dining experiences, the study should be duplicated in other geographical areas and in other cultures. Finally, there is also a need to identify additional physical and psychological boundary factors that can be used to improve solo dining experiences.

Appendix A. Measurement items

Constructs	Items
Inter-table distance	When I eat alone in this restaurant, there is adequate distance between my seat location and others immediately adjacent to me. Eating alone at this restaurant provides adequate space between my seat location and others surrounding me.
Exclusive use	Overall distance between tables and chairs are too close to each other in this restaurant (reverse-coded). Prior to being seated, all necessary items (ex. napkins, tableware, glassware and condiments) were already provided for my solo dining experience. Items used for my solo dining experience (ex. napkins, tableware, glassware and condiments) are only arranged for my individual use.
Place dependence	I do not share condiments with others during my solo dining experience. I think this restaurant would be the best choice for dining solo. I cannot imagine a better restaurant than this for solo dining.
Place identity	There are no other nearby suitable options for solo dining except this restaurant. I feel familiar with this restaurant. This restaurant gives me a sense of belonging. I feel that this place is part of me.
Uncomfortable gazes from others	When I eat alone, I feel as though I receive uncomfortable gazes from other customers. I feel awkward when other customers look at me when I eat alone. I feel I receive gazes of pity from other consumers because I am dining solo.
Perceived territoriality	I feel I have enough secured space surrounding me when eating alone in this restaurant. I have adequate personal space when eating alone in this restaurant. I feel high personal ownership regarding my table and seat when eating alone in this restaurant. I feel secure with the table and seat assigned and prepared only for myself and my exclusive use.
Solo dining satisfaction	I am satisfied with my decision to solo dine at this restaurant. I feel satisfied with my experience to solo dine this restaurant. Overall, I am satisfied when visiting this restaurant when solo dining.
Revisit intention to dine alone	I would like to revisit this restaurant for my solo dining needs in the near future. I like to revisit this restaurant when I eat alone. I intent to revisit this restaurant for solo dining.
Desire for gastronomy	I eat alone because of the freedom it provides me to choose my favorite food without having to acknowledge food preferences of others. I eat alone because of the freedom it provides me to choose my favorite food based upon when I want to enjoy it. I eat alone to enjoy my food without having to consider time requirements of others.
Desire for convenience	I eat alone for my convenience because I do not need to consider others' schedules. I eat alone to best manage my time constraints. I eat alone because I do not need to consider the time, place, or costs with others.

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