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**“I feel copacetic eating alone, but I don’t feel the same if I see others eating alone”:
Emotional congruence of solo diners and its effect upon satisfaction**

Abstract

This study was designed to examine how the emotional congruence of solo diners with other diners affects dining satisfaction based on theoretical foundations of social servicescape, emotional comparison, and emotional congruence theory. In combination with China as a regional consideration, the moderating effect of generation (i.e., Generation Z versus the older generational group) was also tested. A total of 637 responses obtained from solo diners in Macao were analyzed using polynomial regression with response surface analysis. Results showed that congruence in both positive and negative emotions between solo diners and other diners was positively related to solo dining satisfaction. Incongruence in positive emotion between solo diners and other diners led to positive solo dining satisfaction while incongruence in negative emotion between them resulted in negative solo dining satisfaction. Furthermore, Generation Z’s solo diners were found to be more affected by their own emotions than by those of other diners.

Keywords: Chinese solo diners; emotional congruence; emotional comparison; solo dining satisfaction; Generation Z

1. Introduction

Solo dining is now emerging as a global phenomenon. Media and studies have consistently reported the increasing solo dining markets (Her & Seo, 2018; Hwang et al., 2018). Among solo lifestyle trends, the increased visibility of solo diners has been highlighted in media in diverse countries. Particularly, COVID-19 has caused people to change dining habits and the social meaning of dining-out. People have become used to eating alone during the pandemic. It has facilitated an increase of tables for solo diners at restaurants worldwide, reflecting both restaurant managers' safety recognition and consumers' demands to keep social distance during the restaurant dining experience (Gaudino, 2020).

Considering this trend, more academic investigations into solo dining emotions are required. Existing literature has suggested that dining alone publicly is not a pleasant option (Brown et al., 2020). Contrastingly, recent industry reports show that the notion of dining alone is changing (Stephenson, 2020). The implications of dining out alone have gradually shifted from loneliness to empowerment and enjoyment of a solitary state (Stephenson, 2020). While past studies have investigated emotions and the role of other diners on general dining satisfaction (Erkmen & Hancer, 2019), there has been little research on solo dining settings (Liu & Mattila, 2015).

The influence of other diners on the dining experience has been considered in the literature about the social servicescape which incorporates the elements that a consumer senses during dining experiences. Although prior research has examined how the dining settings of other diners affect the perceptions and emotions of solo diners, only limited variables have been tested. For instance, Her and Seo (2018) contributed to the solo dining literature by highlighting the impact of other solo diners vis-a-vis group diners on solo diner's feelings of loneliness and

behavioral intention. However, gaps remain in terms of valence (i.e., positive and negative emotions) and other diners' emotions and their impact on diners' satisfaction.

Considering the research gaps, this study examined the emotions of dining alone at the restaurants in the Chinese context, with a focus on generational characteristics. With a population exceeding 1.4 billion, solo dining has become more popular in China, driven by internal migration to cities, a growing single population, and single-person households. Chinanews (2020) reported that there are 240 million single Chinese adults, and the solo living population was expected to increase to 92 million people by 2021. Foodservice for one person has been highlighted as one of the recent trends in China (China Food News, 2020). Social acceptance and changing attitudes about solo dining has been observed in China, especially among the younger generations (Zhang, 2019). This study focused on Generation Z, also known as post-90s (*jiulinghou*) in the Chinese context. This generation has strong purchasing power and distinctive lifestyles and world views that are different from the older generations. Anecdotal evidence has suggested that this consumer group has the proclivity to eat out due to their hectic lifestyles (Chinanews, 2020). By investigating the solo dining experiences and, specifically, solo dining emotions of Generation Z in China, this current study was designed to shed light on the rapid changes of the Chinese society and, in particular, the dining culture.

This study adopted a psychological theory of emotional congruence to examine the emotions of solo diners associated with themselves vis-a-vis other solo diners. The study addressed the following research questions: (1) How does the solo diners' (positive and negative) emotional congruence with other solo diners influence satisfaction with solo dining? (2) How does a generational factor moderate the relationship between emotional congruence and satisfaction with solo dining?

2. Literature review

2.1. Social servicescape in solo dining

Since the emergence of the servicescape concept (Bitner, 1992), foodservice researchers have highlighted how environmental surroundings, including ambience, spatial layout, physical elements, signage, and decoration affect consumers' cognitive, affective, and behavioral responses in their dining experiences. The concept of social servicescape, which captures the engagement of consumers and co-creation of dining experiences through social interactions, has emerged as an important element in the dining experience (Rosenbaum & Massiah, 2011). Social servicescape incorporates active and passive personal encounters, such as interactions among the diners and observations of others during the dining experience (Baker & Kim, 2020; Lin et al., 2020).

The notion of congruence, explained in the context of social servicescape, emerges from perceiving and interacting with others. Baker and Kim (2020) highlighted that the congruence of oneself with other consumers in terms of demographic profile, appearance, interest, and lifestyle is shaped by environmental cues and its positive impacts. Similarly, Line and Hanks (2018) included the appearance, attitudes, behaviors of other diners as well as the dining conditions such as crowdedness and density as components of social servicescape, which is observable by a diner about other diners and employees during the dining experience.

Social servicescape is predicated on social impact theory (Latané, 1981), which has also been applied to the solo dining context (Hwang et al., 2018). This theory denotes that one is influenced by others in social interactions depending on the strength (i.e., age, social class, depth of relationship, hierarchical relationship), immediacy (i.e., spatial and/or temporal distance), and number of other people. Line and Hanks (2018) interpreted that strength could be measured by

perceived similarity, physical appearance, and behavioral appropriateness of other diners. Also, stressing the desire to interact with others as one important aspect of understanding the influences in dining at a restaurant, they proposed the number of other diners, immediacy (i.e., physical distance from other diners) as indicators for social density. Diner interactions in Line and Hanks (2018) were confined to passive interactions; they postulated that how diners observe others is more crucial than how they actively communicate with other diners because the nature of the dining experience is that such active interactions are not so common during solo dining. We argue that how solo diners observe and perceive the behaviors and emotions of other solo diners form an important aspect of the social servicescape of solo diners.

As one of the few studies that has applied social impact theory to solo dining, Her and Seo (2018) focused on crowdedness, loneliness, and expected negative evaluation from others in understanding dining emotions and intention to dine alone. Furthermore, social servicescape also has been considered an important variable in predicting attitude, satisfaction, and loyalty in the accommodation (Line & Hanks, 2019) and restaurant sectors (Hanks & Line, 2018; Line & Hanks, 2020). Past studies have investigated the impact of social servicescape on positive and negative emotional responses in the general dining experience (Line & Hanks, 2018) and negative emotion, such as loneliness, in solo dining (Her & Seo, 2018). Gaps remain in the existing knowledge of specific domains of consumption emotions in relation to the perceived social servicescape. Social servicescape has been linked to holistic emotional variables (Hanks & Line, 2018; Line & Hanks, 2019), not the valence of emotions (Ribeiro & Prayag, 2019). Thus, this study postulates emotions as a two-dimensional construct and incorporates the initial assumption of social servicescape in understanding emotions by investigating the *perceived* level of *emotional similarities* with other solo diners. In other words, how one's and others' solo

dining behaviors are perceived as similarly positive or negative reflects the physical appearance and behavioral dimensions of the social servicescape. As we focus on solo diners, employee servicescape is not considered as they do not behave the same (i.e., dine alone) in this situation. To effectively compare the emotions of self and others and the outcomes of the comparison, we refer to the concepts of emotional comparison and emotional congruence.

2.2. Emotional comparison in solo dining

Social comparison theory (Festinger, 1954) has facilitated the understanding of human traits of evaluating opinions and abilities through comparison with others, with emotions as the evaluation outcomes. With the emergence of the ‘relational turn’ in the field of psychology (Aron & Harris, 2014), researchers have highlighted the understanding of one’s emotions in relation to the others’ emotions in order to provide more meaningful outcomes of psychotherapy (Chui et al., 2016) and customer service (Drèze & Nunes, 2008; Goor et al., 2019; Namkung & Jang, 2010; Stuppy et al., 2019). Researchers have further acknowledged diverse interpersonal impacts on one’s emotions and the resultant behavioral outcomes (Parkinson & Manstead, 2015). Furthermore, many cognitive empathy studies have focused on the abilities to capture others’ emotions, and emotional contagion has emphasized how one’s emotions or emotional expressions affect others’ emotions and vice versa. In particular, previous or current experiences of similar situations have been reported as a facilitating factor of emotional connections (Gump & Kulik, 1997).

In the hospitality context, studies have focused on the emotions aroused by the comparison of oneself with others. The notion of fairness comparison (Namkung & Jang, 2010) suggests that diners tend to compare themselves with other diners in terms of the internal

characteristics of the latter (e.g., appearance of other diners) and how the diners are affected by and react to the environment (e.g., service levels, other diners' attitudes and reactions to the dining situations). A sense of superiority and perceived status as outcomes of the comparisons that are driven by loyalty programs (Drèze & Nunes, 2008) or luxury product consumption (Goor et al., 2019) has been studied. Conceptualizing consumption as the function of self-esteem and self-verifying in comparison to others, Stuppy et al. (2019) linked comparison-led emotions to self-esteem. However, this study did not discuss the perceived congruence of emotions, which goes beyond the mere comparison of one's consumption situation with others.

Thus, notwithstanding the contribution of this stream of research in terms of revealing emotions that arise from comparison, relational emotions, and specifically the recognition of the importance to understand others' emotions in relation to oneself, research gaps exist. Despite the interest in consumption emotions in general, limited hospitality and solo dining studies as well as studies about Generation Z in this context have adopted the concept of social comparison of emotions. The focus and applications to customer service in hospitality have been limited to evaluating emotional intelligence, particularly of service providers (Kim et al., 2012). Prior research has regarded social comparison as a concept similar to social servicescape. Measuring social comparison as perceived similarity of behaviors and appearance of oneself to other consumers, it has been tested as a factor affecting emotions (Jani & Han, 2013). Existing research postulates perceived similarity or consistency as antecedents of emotions (Jani & Han, 2013), rather than measuring the similarity of emotions. Furthermore, in addition to the mere comparison of emotions and relative emotional states, such as downward versus upward and assimilative versus contrastive states, valence of emotional states (i.e. positive and negative emotions) of oneself and others also needs to be considered. Kim and Choi (2019) is the only

study to the best of the authors' knowledge which measured positive and negative emotions of both solo diners and the emotions towards other solo diners. However, they did not explicitly present a theoretical background which was the basis of the development of their measurement items for the emotions. Furthermore, their study did not compare their own emotions to those of other diners. Extant studies on emotional congruence still could provide insights into capturing non-evaluative and comparative estimation of emotions for understanding diners' emotions.

2.3. Emotional congruence and emotional comparison in solo dining

Emotional congruence, also known as emotional empathy (Duan & Kivlighan, 2002), is integral in understanding emotions in relation to others. It concerns how and how much one's emotions correspond with and thus sympathize with the counterpart (Atzil-Slonim et al., 2018). Emotional congruence is adopted in psychotherapy research which considers the composite impacts of the emotional dynamics of the therapists (or the service providers) and the clients (or the consumers). Emotional congruence is used to explain how the combination of emotional states of one and the counterpart yields better and more efficient treatment outcomes than others (Aron & Harris, 2014). In clinical psychology, emotional congruence has been a key indicator in deepening emotional connections between the two parties and better outcomes (Koole & Tschacher, 2016). Applying this concept in the context of solo dining, we argue that the enhanced outcomes would appear as a diner's satisfaction with the consumption experience. In other words, emotional congruence is expected to be associated with solo diners' satisfaction.

Different from emotional congruence studies in clinical psychology and marketing, where the focus has been on that between the service provider (or a therapist) and the consumer (or a patient) (Atzil-Slonim et al., 2018), emotional congruence in foodservice research could be

understood from two different aspects—emotional congruence between the service provider and the consumer and emotional congruence between the consumers. However, most studies about relational emotions have been on the impact of the consumers’ emotional expressions on the employees’ emotions and their behavioral outcomes (Kashif et al., 2017) or employee-consumer interactions on consumers’ emotions (Lin & Mattila, 2010). The consumers’ emotions about other diners in relation to themselves have been overlooked in existing literature. The importance of comparing the emotions of solo diners versus perceived emotions of other solo diners is supported by previous studies which have asserted that consumers evaluate their consumption experiences in relation to others (Goor et al., 2019; Namkung & Jang, 2010; Stuppy et al., 2019). Thus, in this study, we examined the emotional congruence between what the solo diner feels about their solo dining situation and how the diner perceives the emotions of other solo diners.

Although scholars have supported differentiated impacts of emotional congruence based on the emotional valence (i.e., positive and negative emotions), it has not been fully considered in understanding emotional congruence in foodservice settings (Choi et al., 2016). Studies have explored the differentiated impacts of emotional valence on outcomes, such as post-consumption behaviors (Ribeiro & Prayag, 2019). It is expected that the level of impact of the diners’ emotional congruence with other diners is different depending on the valence of emotions. Synthesizing the notion of valence in emotional congruence between how a solo diner feels about their own dining situation and how they perceive the emotions of other solo diners, the following hypothesis was developed:

Hypothesis 1: Emotional congruence between solo diners and other diners is positively associated with the solo diner’s satisfaction.

Hypothesis 1a: Congruence in positive emotion between solo diners and other diners is positively associated with the solo diner’s satisfaction.

Hypothesis 1b: Congruence in negative emotion between solo diners and other diners is positively associated with the solo diner's satisfaction.

2.4. Chinese solo diners and Generation Z

In contrast to the general perception of the deep-seated social meaning of group dining in Asia (Edwards, 2013), the Chinese solo dining market has grown rapidly: The growth is especially noticeable after having experienced and partly recovered from the COVID-19 pandemic. In combination with single-oriented lifestyles and online technologies which could minimize employee-to-consumer interactions for food ordering and delivery, there have been increasing attempts to open restaurants for solo diners in China (Wei, 2020). Although the Chinese influence of group dining still prevails, the social acceptance of solo dining is particularly prominent among the people in South China (Sun, 2019), who are more likely to be individualistic due to affluence and urbanization (Cui & Liu, 2000).

Solo dining is well accepted among the Chinese Generation Z, a demographic group born after the mid-1990s (Turner, 2015). It is of significance because of its population size; Generation Z accounts for 30% of the global population and 22% of the population of China as of 2019 (OC&C Strategy Consultants, 2019). Existing studies about this generation have predominantly focused on their primary and secondary education and personal development. As part of this demographic group has reached its adult years, members of Generation Z are emerging as primary consumers with purchasing power and as entry-level in the workforce. Furthermore, the younger population is likely to enjoy living alone (Du, 2019). Thus, the demand for solo living as well as solo dining for this generation is expected to be increasingly significant in the future.

Generation Z is the first generation native to digital technologies and social media (Turner, 2015; Zhou & Worku, 2019). Accordingly, most studies on this generation have investigated its attitudes and behaviors expressed online, such as the traits of online self-expression (Vitelar, 2013) and also how being digitally native affects offline interactions (Turner, 2015). Specifically, Turner (2015) elaborated on the strong impact of online interactions on the emotions of this generation and, at the same time, decreased opportunities for this generation to have offline interactions. He pointed out negative impacts, such as cyberbullying, distractions, and a lack of in-person interactions of this generation. On the other hand, this also suggests that this generation would be familiar with offline solitary activities such as solo dining. Specifically, the Chinese Generation Z are reported to have traits similar to the same generation from other cultural backgrounds. Its members actively interact with others online, expressing their unique individual qualities (OC&C Strategy Consultants, 2019). They do so through the consumption of particular brands (McKinsey & Company, 2020). A few distinct traits of members of Chinese Generation Z suggest that their solo dining emotions and their perceptions of others' emotions would be distinct from other generations. For example, OC&C Strategy Consultants (2019) reported that this generation in China tends to value their own experiences rather than to be conscious about others' reputations. This may suggest that, being relatively more self-centered, the valence of one's emotions during the solo dining experience would be connected to (dis)satisfaction more strongly than other generations. Considering the unique ways that the emotions and satisfaction of members of Generation Z are interwoven, Hypothesis 2 is presented as follows:

Hypothesis 2: The generational group (Generation Z versus older generations) moderates the association of the emotional congruence between solo diners and other diners with solo dining satisfaction.

3. Methods

3.1.Data Collection and Sampling

The study reported here was part of a bigger project which explored Macao Chinese people's solo dining. Exploratory sequential mixed methods (Creswell & Plano Clark, 2018) were used, conducting qualitative and quantitative studies sequentially. In addition to the literature review about solo dining emotions, a series of semi-structured interviews with ten solo diners enabled additional insights into the spectrum of emotions when dining alone and when observing other solo diners. Then an offline survey was conducted in 2018. The population of this study was the Macao diners, with a population of around 600,000. Using a mall-intercept sampling method, 1,773 Macao Chinese residents who identified themselves as having had a solo dining experience were approached. Among them, 663 responses were collected, with a 37.39% response rate, and among them, 637 valid responses were used for the analysis. With a 95% confidence level, the confidence interval for the sample size was 3.88. Tests were conducted at the significance level of 0.05 (two-tailed).

3.2.Characteristics of the Study Sample

About 43% of the respondents were male, 57% female. Generation Z respondents, accounting for 31.1% of the respondents, were classified as those who were between the ages of 18 and 24. Reflecting this young generation, around 32.7% of the respondents had a monthly individual income less than 10,000 MOP, and 21.7% were students, while most were either professionals (26.2%) or service workers (30.9%), with a bachelor's degree (48.0%; See Table 1 for details).

[Insert Table 1]

3.3.Measures

The questionnaire consisted of three sections. The first section asked about solo dining characteristics in order to explore the respondents' solo dining profile. The main variables used for the present study were included in the second section. As presented in Table 2, items measuring positive and negative emotions of solo diners were adopted from Cho et al. (2015), Bianchi (2016), and the interviews. Satisfaction with dining experience was adopted and modified from Ryu et al. (2012). An eleven-point scale was used to measure the items, ranging from 0 to 10 (0=not at all, 10=extremely). The questionnaire was first developed in English and then was translated into Chinese, both of which were further compared and checked by an author who is a native speaker of both languages and another author who is proficient in both languages. Then the translated questionnaire was reviewed by ten Macao residents and checked with a pilot test.

[Insert Table 2]

3.4.Data Analysis

This study's analysis incorporated polynomial regression with response surface analysis by following more recent studies that investigated how the relationships between two predictors (X and Y) affect an outcome (Z) (Atzil-Slonim et al., 2018). This process allows for a more comprehensive examination of how different combinations of two predictors (solo diner emotions (X) and solo diner perceptions of other solo diner emotions (Y)) affect solo dining satisfaction (Z) while simultaneously discovering those different roles of solo diners and their perceptions of other diner emotions upon solo dining satisfaction.

This study's data analyses were undertaken using a two-step procedure. First, polynomial regression models were developed to investigate how emotional congruence between solo diners and their perception of other diners affects solo dining satisfaction. The polynomial regression equation included two independent variables (X and Y) and two quadratic terms (X^2 and Y^2) for each independent variable, along with the interaction term (XY) expressed as follows:

$$Z \text{ (solo dining satisfaction)} = b_0 + b_1X \text{ (solo diner emotions)} + b_2Y \text{ (solo diner perceptions of other diner emotions)} + b_3X^2 + b_4XY + b_5Y^2 + e$$

In this study, the moderating effect of generation was also hypothesized: the relationships between solo diners and their perceptions of other solo diner emotional congruence and solo dining satisfaction were expected to be significantly different between Generation Z and the older generational group. In doing so, the moderating variable (W : Generation Z) along with three interaction terms (XW , YW and XYW) were added in our original polynomial regression models as follows:

$$Z \text{ (solo dining satisfaction)} = b_0 + b_1X \text{ (solo diner emotions)} + b_2Y \text{ (solo diner perceptions of other diner emotions)} + b_3X^2 + b_4XY + b_5Y^2 + b_6W \text{ (Generation Z)} + b_7XW + b_8YW + b_9XYW + e$$

In the second step, a response surface analysis was conducted to explore and display the dynamic relationships between the combinations of the two independent variables (X and Y) and the dependent variable (Z) in three-dimensional space using the SYSTAT 13 statistical tool. Scale-centered measures of all variables using five as the midpoint on a eleven-point scale (0–10) were employed in order to reduce potential multicollinearity issues according to Edwards & Parry's (1993) recommendation.

4. Results

4.1. Reliability and validity assessment of the measures

Confirmatory factor analysis was conducted to test reliability and validity of the measures. Goodness-of-fit statistics showed a good fit ($\chi^2/df = 2.344$, $p < 0.001$; CFI = 0.939; IFI = 0.927; GFI = 0.913; RMSEA = 0.065; see Table 2). All composite construct reliability values ranged from 0.813 to 0.882, exceeding the recommended threshold of 0.70. Cronbach's alpha coefficients ranging from 0.798 to 0.877 were acceptable, supporting internal consistency of the measurement items (Hair et al., 2009). All standardized factor loadings ranged from 0.619 to 0.873 which were significant. All average variance extracted (AVE) values ranged from 0.535 and 0.612, exceeding the suggested cutoff of 0.50. Thus, convergent validity of the measurement items was supported (Hair et al., 2009). Additionally, Table 3 shows that the largest correlation between the variables was smaller than all square roots of the AVE values for the paired latent variables. This result supports discriminant validity of the measurement items (Fornell & Larcker, 1981)

[Insert Table 3]

4.2. Polynomial regression analysis: the effect of emotional congruence on solo dining satisfaction

As presented in Table 4, two polynomial regression models (Models 1 and 2) were developed. Model 1 focused on positive emotion, and it included two predictors: “solo diner positive emotion (PE)” (X) and “solo diner perceptions of the PE of others” (Y), two quadratic terms (X^2 and Y^2) of each predictor, and one interaction term (solo diner PE \times PE of others, XY), along with two control variables (gender and frequency of solo dining). Model 2 was developed to test the effect of negative emotion (NE) on solo dining satisfaction (see Table 4). Among our

two control variables, only one factor, “frequency of solo dining” was found to be significantly and positively related to solo dining satisfaction in both models. Specifically, Model 1 tested the effects of solo diner PE and the PE about others upon solo dining satisfaction (see Table 4). Solo diner PE associated with their solo dining satisfaction was significantly positive ($b_1 = 0.348, p < 0.001$), however, the PE of others did not have such a relationship ($b_2 = 0.004, p > 0.05$).

In addition, Model 2 tested solo diner NE and the NE of others, which demonstrated that solo diner NE was significantly and negatively associated with their solo dining satisfaction ($b_1 = -0.098, p < 0.05$). However, the NE of others had no significant relationship with solo dining satisfaction ($b_2 = 0.054, p > 0.05$). Our findings provided evidence that higher PE and lower NE of solo diners lead to better solo dining satisfaction. Conversely, neither the PE nor NE of other diners was significant in shaping solo dining satisfaction. The R^2 values of both Model 1 ($R^2 = 0.195^{***}$) and Model 2 ($R^2 = 0.109^{**}$) were significantly different from zero, supporting that our polynomial regression models were appropriate to be used for a response surface analysis (Shanock et al., 2010).

[Insert Table 4]

4.3. Response surface analysis: the effect of emotional congruence on solo dining satisfaction

Hypothesis 1 expecting a significant relationship between emotional congruence and solo dining satisfaction was tested using response surface analysis. As seen in Table 4, the PE surface showed that along the congruence line ($Y = X$), representing “congruence in PE between solo diners and other diners,” the slope ($b_1 + b_2 = 0.337, t=7.285^{***}$) and the curvature ($b_3 + b_4 + b_5 = 0.071, t=5.142^{***}$) were both significant and positive. These findings indicated that congruence

in PE between solo diners and other diners was significantly and positively related to solo dining satisfaction along a convex surface. Thus, Hypothesis 1a was supported.

Figure 1 depicts more detailed relationships between emotional congruence and solo dining satisfaction in three-dimensional space. The left graph shows the relationships between solo diner PE, the PE of others, and solo dining satisfaction. The graph shows the highest level of solo dining satisfaction at the back corner of the surface where solo diner PE and the PE of others are both highest while solo dining satisfaction decreases at the front of the surface where solo diner PE and the PE of others are both low. More specifically, the graph displays that solo dining satisfaction is higher at the right corner of the surface (solo diner PE > the PE of others) than at the left corner of the surface (solo diner PE < the PE of others). These indicate that when solo diners feel that their PE is stronger than their perception of the PE of other diners, they will be more satisfied with their solo dining. However, solo dining satisfaction will significantly diminish when solo diners feel that the PE of others is stronger than theirs.

[Insert Figure 1]

As presented in Table 4, results of testing the NE surface found that along the congruence line ($Y = X$), representing congruence in NE between solo diners and others, the slope was insignificant ($b_1 + b_2 = -0.048, t = -1.352$); however, the curvature was significant and positive ($b_3 + b_4 + b_5 = 0.059, t = 4.251^{**}$). These findings indicate that congruence in NE between solo diners and others was significantly related to solo dining satisfaction along a convex surface. Thus, Hypothesis 1b was supported.

The right graph in Figure 1 depicts the associations between solo diner NE, the NE of others, and solo dining satisfaction. Although solo diners who felt strong NE were less satisfied with their solo dining, the graph shows that solo dining satisfaction decreases less at the back

corner of the surface where solo diner NE and the NE of others are both high; and at the front corner of the surface where solo diner NE and the NE of others are both very low. These results imply that solo dining satisfaction is still relatively high when solo diners feel that the NE of others are congruent with their NE. Additionally, the graph shows that solo dining satisfaction is higher at the left corner of the surface (solo diner NE < the NE of others) than at the right corner of the surface (solo diner NE > the NE of others). This implies that solo dining satisfaction will significantly diminish when solo diners feel that their NE is stronger than others. This direction of incongruence indicates that solo dining satisfaction decreases less when solo diners feel that their NE is weaker than the NE of others.

4.4. Moderating Effects of Generational Groups: Generation Z vs. Older Generations

Hypothesis 2 expected the moderating effects of generations on the relationships between emotional congruence and solo dining satisfaction. Model 1 in Table 5 shows that the interaction term of (solo diner PE \times Generation Z) as it relates to solo dining satisfaction was found to be significant and positive ($b_7 = 0.362, p < 0.001$); in contrast, the interaction term of (the PE of others \times Generation Z) was significantly and negatively related to solo dining satisfaction ($b_8 = -0.277, p < 0.001$). These results imply that the positive effect of solo diner PE on their solo dining satisfaction was significantly stronger in the Generation Z group than in the older generational group.

Model 2 in Table 5 indicates that the interaction term (solo diner NE \times Generation Z) was significant and negative ($b_7 = -0.229, p < 0.05$). This shows that the negative effect of solo diner NE on solo dining satisfaction was stronger in the Generation Z group than in the older generational group. Both models showed that the values of R^2 in Step 2 significantly increased

by 0.017 ($\Delta F = 3.469^{**}$) and by 0.015 ($\Delta F = 2.815^*$) when adding the moderating variable (Generation Z) and those interaction terms. Accordingly, surface tests were conducted for further response surface analyses.

[Insert Table 5]

The left graph in Figure 2 shows that, for PE, solo dining satisfaction for both the Generation Z and the older generational group increases as solo diner PE and the PE of others are positively congruent (e.g., $X = 5, Y = 5$) along the surfaces. The graph also presents higher solo dining satisfaction at the right corner of the surface where solo diner PE is greater than the PE of others (e.g., $X = 5, Y = -5$) in the Generation Z group than in the older generational group. However, the surface on the left corner where solo diner PE is smaller than the PE of others (e.g., $X = -5, Y = 5$) shows much lower solo dining satisfaction for Generation Z than for the older generational group. These results indicate that solo diners' satisfaction for the Generation Z group is more likely to be determined by their PE regardless of levels of the PE of others. In contrast, solo diners' satisfaction for the older generational group is more likely to be determined by combining the PE of others with their PE.

[Insert Figure 2]

The right graph in Figure 2 depicts that solo dining satisfaction decreases less when the NE of solo diner and others are congruent for both the Generation Z and the older generational group. Solo dining satisfaction greatly decreases at the right corner of the surface where solo diner NE is greater than the NE of others (e.g., $X = 5, Y = -5$) for both the Generation Z and the older generational group. Also, in the older generational group, solo dining satisfaction greatly decreases at the left corner of the surface where their NE is smaller than the NE of others (e.g., $X = -5, Y = 5$). However, solo diners' satisfaction for the Generation Z group is still relatively high

at the left corner of the surface where their NE was weak, but the NE of others was strong. These findings confirm that the negative effect of solo diner NE on their satisfaction would be stronger for the Generation Z group compared with those for the older generational group. However, the older generational group and their solo dining satisfaction would be more affected by the NE of others combined with their NE. Therefore, Hypothesis 2 was supported.

5. Conclusions and Discussion

The results from the polynomial regression analysis show that, in line with the findings from previous studies about social servicescape (Hanks & Line, 2018; Line & Hanks, 2020), higher PE and higher NE of solo diners themselves are, positively and negatively, respectively, associated with satisfaction. With regards to Hypothesis 1, the results from the response surface analyses supported for both PE and NE the significant and positive impacts that emotional congruence have on solo dining satisfaction.

First, the data showed the highest satisfaction when the solo diners had the highest levels of positive emotional congruence with other diners. Satisfaction significantly increased with the curved line as the solo diner had stronger PE altogether with the emotions about other diners. Similarly, the satisfaction level increased along with the curved line when the solo diners had stronger negative emotional valence along with how they perceived other diners' emotions. Additionally, the curvature on the opposite direction along the congruence lines suggests that the stronger the negative emotion for both the solo diner and other diners, the higher the satisfaction. The results suggest that stronger emotional congruence leads to higher satisfaction in either valence of emotions, supporting Hypothesis 1. In addition to findings from previous studies which have urged managers to understand the emotions of solo diners, the findings from this

study suggest that how strongly the diners feel in congruence with how strongly they feel about others positively affects satisfaction.

Furthermore, the curvature along the incongruence lines suggests that stronger incongruence led to lower satisfaction. That is, the stronger the positive emotion the solo diners have about themselves and, at the same time, the stronger the negative emotion the solo diners have about other diners, the lower satisfaction they have. Stronger negative emotion about the solo diners themselves in combination with stronger positive emotion about other solo diners would be associated with even lower satisfaction. Overall, the results support findings from previous studies about the social servicescape and consumer-consumer co-creation of the consumption experience and the impact of congruence on such a co-creation experience (Baker & Kim, 2019). The results from this study, which yielded higher satisfaction when the diner felt positive and concurrently perceived other solo diners as feeling less positive, imply that a sense of “being better than others” would have led to higher satisfaction.

Higher satisfaction was consistently revealed when the solo diner had PE about their solo dining and when the solo diner felt similarly positive about their own and others’ solo dining situation rather than a situation where the solo diner perceived their emotions were more positive than the emotions of other diners. Contrastingly, in the situation where the solo diner felt negatively about their dining situation, when a solo diner perceived other diners felt less negative (or more positive) than themselves, the solo diner had a drastically lower level of satisfaction. This might have been caused by a sense of relative deprivation (Smith & Pettigrew, 2015) or a sense of inferiority associated with lower self-esteem.

Regarding testing the moderating role of generation, the results showed a distinct difference in the way emotions were associated with solo dining satisfaction for Generation Z in

contrast to other generations, supporting Hypothesis 2. First, for Generation Z, the tendency that stronger PE were associated with higher satisfaction and that strong NE were associated with lower satisfaction was more salient than for the older generational group.

Furthermore, Generation Z's solo dining emotions, both positive and negative, were significantly less affected by the projected emotions of other solo diners compared with other generations. The results imply that Generation Z tends to be self-centered in the solo dining experience and in their feeling during solo dining. This reflects some traits of the self-centered tendency of the Chinese younger generation (OC&C Strategy Consultants, 2019). The influence of other solo diners' is more relevant for older generations than Generation Z in restaurant service design catering to solo dining in Chinese culture.

Based on these findings, discussions of potential contributions to solo dining research were developed. First, this study adds to the body of knowledge about the emerging theme of solo dining emotions. In this study, it was pointed out that previous foodservice research focused on only the emotional comparison of the service providers and the diners. The attempts to compare a diner's own emotions with the projected emotions of others in solo dining settings have been almost non-existent. This study is one of the first attempts in the solo dining setting to examine how one's own emotions and those of others are associated with diners' satisfaction. The findings provide implications to restaurant managers and foodservice providers to go beyond capturing the diners' own emotions and understand that how diners think about others also affects their dining experience. In order to maximize the PE of solo diners themselves and their perception of other diners' emotions, managers could create solo dining-friendly servicescapes, such solo dining-friendly menus, solo dining-friendly table settings, adequate distances between tables. Managers could also intermingle a combination of group and solo diners adequately to

control overcrowding of each segment, creating adequate ambience to minimize NE such as loneliness, isolation, stress, and boredom.

Furthermore, despite an increasing interest in solo dining in South China and among Chinese Generation Z, there has been a dearth of scholarly research on this group of solo diners. This study advances the existing understanding of solo dining in these regional and generational contexts, thus providing implications for managers to better cope with the consumers in different generations in this region. Also, the moderating effects of Generation Z advances from social impact theory (Latané, 1981). Extending existing understanding of social servicescape, in which the influence of others is shaped by the strength of social interactions, immediacy, and the number of other people (Latané, 1981), this study demonstrates that the influence of others could differ significantly by generation.

Last, in this study, the theories and concepts of social servicescape, emotional comparison, and emotional congruence from clinical psychology were combined with additional consideration of valence of emotions and the subjects of emotional congruence (i.e., emotions of oneself vs. projected emotions of other solo diners), separately and fragmentally done in previous studies. In doing so, this study extended the understanding of how solo diners compare themselves with others emotionally in addition to cognitively, which social servicescape usually concerns. Furthermore, this study is pioneering in that it applied the psychological theories of emotional comparison and congruence to the solo dining context and extended the focus of comparison and congruence to own versus projected emotions instead of interpersonal emotions, which are the perspectives adopted in clinical psychology.

6. Limitations and directions for future studies

This study has a few limitations. First, solo dining emotions in this study were collected through a survey where respondents reported their emotions about solo dining retrospectively. The rationale of using a retrospective survey was based on the consideration that approaching solo diners for surveys or conducting an experiment on solo dining emotions might disturb the subjects' real experience. Future research is encouraged to develop other innovative methods, such as observations, experiments, or scenario-based surveys or interviews, to capture vivid solo dining emotions. Second, the stages of solo dining were not considered in this study. Future research could investigate the dynamics and changes in emotions throughout the different stages of a solo dining experience, from waiting to be seated, ordering the dish, waiting for the dish to be served, during meals, and after finishing the meal and before checking out.

Third, future studies are suggested to test how other social servicescape variables, such as social density (how crowded the restaurant and how physically close a diner is with others), moderate consumption emotions and satisfaction. Fourth, the study was conducted in South China and, specifically, a Special Administrative Region in China. As regional differences in China have been well documented (Cui & Liu, 2000), the results should be carefully interpreted before generalizing the findings to other regions. Last, but not least, follow-up qualitative studies are expected to enhance further understanding of how and why emotional congruence and incongruence of solo diners with other diners lead to different levels of satisfaction.

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Table 1.
Survey sample profile

Gender	<i>N</i>	%
Male	274	43.0
Female	363	57.0
Age		
18-24	199	31.1
25-34	187	29.4
35-44	95	14.9
45-54	85	13.3
55-64	58	9.1
65 or above	14	2.2
Monthly individual income (in MOP, 1 USD = about 8 MOP)		
<10,000	208	32.7
10,000 to 19,999	223	35.0
20,000 to 29,999	137	21.5
30,000 to 39,999	44	6.9
40,000 or above	19	3.0
No answer	6	0.9
Occupation		
Professional	167	26.2
Trade worker or manual labourer	49	7.7
Service worker	197	30.9
Student	138	21.7
Retired	35	5.5
Self-employed	31	4.9
Unemployed	12	1.9
Other	8	1.3
Relationship status		
Single	250	39.2
In a relationship (live together)	37	5.8
In a relationship (live separately)	117	18.4
Married	213	33.4
Divorced	18	2.8
No answer	2	0.3
Living arrangement (multiple answer allowed)	<i>n</i>	%
With partner	244	38.3
With children	151	23.7
With parents	289	45.4
Alone	54	8.5
Share house with strangers	4	0.6
With friends	19	3.0
Dormitory	11	1.7
Relatives	10	1.6
Education		
Primary school or below	52	8.2
Secondary school	244	38.3
Undergraduate degree	306	48.0
Graduate degree or above	35	5.5
Total	637	100.0

Table 2.
Validities and reliabilities of measurements

Construct	Standardized loadings	t-Value	CCR ^a	AVE ^b	Cronbach's alpha
Solo diner PE			0.851	0.535	0.839
Liberated	0.684	—			
Relaxed	0.790	17.289***			
Enjoying	0.797	17.339***			
Confident	0.695	15.301***			
Pleased	0.680	15.323***			
Solo diner NE			0.862	0.612	0.854
Isolated	0.692	—			
Stressful	0.710	16.646***			
Bored	0.873	19.803***			
Being gazed by other diners	0.839	19.220***			
PE of others			0.882	0.601	0.877
Liberated	0.619	—			
Relaxed	0.814	16.461***			
Enjoying	0.864	17.112***			
Confident	0.837	16.777***			
Pleased	0.717	15.117***			
NE of others			0.862	0.612	0.863
Isolated	0.704	—			
Stressful	0.745	17.635***			
Bored	0.864	19.971***			
Being gazed by other diners	0.806	18.849***			
Solo dining satisfaction			0.813	0.592	0.798
I am familiar with eating out alone	0.756	—			
I am satisfied with eating out alone	0.823	17.209***			
I am willing to eat out alone	0.726	16.410***			

Notes: ^a CCR: composite construct reliability; AVE: average variance extracted; *** $p < .001$; $\chi^2/df = 2.344$, $p < .001$; CFI = 0.939; IFI = 0.927; GFI = 0.913; RMSEA = 0.065

Table 3.

Correlations and discriminant validity

	Mean	S.D.	1	2	3	4	5
1. Solo diner PE	5.112	2.164	0.731^a				
2. Solo diner NE	3.823	2.452	0.284 ^b	0.782			
3. PE of others	4.725	2.259	0.721	0.394	0.775		
4. NE of others	3.992	2.472	0.298	0.759	0.429	0.782	
5. Solo dining satisfaction	5.903	2.225	0.388	-0.105	0.273	-0.027	0.769

Notes: PE (positive emotion); NE (negative emotion); ^aDiagonal elements (in bold) are the square root of the average variance extracted (AVE); ^bOff-diagonal elements are the correlations among constructs;

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

Table 4.

Polynomial regression analysis results

Dependent variable: solo dining satisfaction			
Model 1 (PE)		Model 2 (NE)	
	Unstandardized beta coefficients		Unstandardized beta coefficients
Constant (b_0)	0.895***	Constant (b_0)	0.978***
Gender	0.171	Gender	0.159
Frequency of solo dining	0.373***	Frequency of solo dining	0.420***
Solo diner PE (b_1X)	0.348***	Solo diner NE (b_1X)	-0.098*
PE of others (b_2Y)	0.004	NE of others (b_2Y)	0.054
Solo diner PE ² (b_3X^2)	0.013	Solo diner NE ² (b_3X^2)	0.004
Solo diner PE \times PE of others (b_4XY)	0.041	Solo diner NE \times NE of others (b_4XY)	0.039
PE of others ² (b_5Y^2)	0.005	NE of others ² (b_5Y^2)	0.017
R^2	0.195*** ^a	R^2	0.109**
Surface tests			
Along $Y = X$ line		Along $Y = X$ line	
Slope ($a_1=b_1 + b_2$)	0.337 (7.285***) ^a	Slope ($a_1=b_1 + b_2$)	-0.048 (-1.352)
Curvature ($a_2=b_3 + b_4 + b_5$)	0.071 (5.142***)	Curvature ($a_2=b_3 + b_4 + b_5$)	0.059 (4.251**)
Along $Y = -X$ line		Along $Y = -X$ line	
Slope ($a_3=b_1 - b_2$)	0.326 (7.034***)	Slope ($a_3=b_1 - b_2$)	-0.151(-4.264**)
Curvature ($a_4=b_3 - b_4 + b_5$)	-0.036 (-2.599**)	Curvature ($a_4=b_3 - b_4 + b_5$)	-0.068 (-4.896**)

Notes: PE (positive emotion); NE (negative emotion); ^a number in parentheses are t -values; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 1.

Emotional congruence between solo diners and other diners

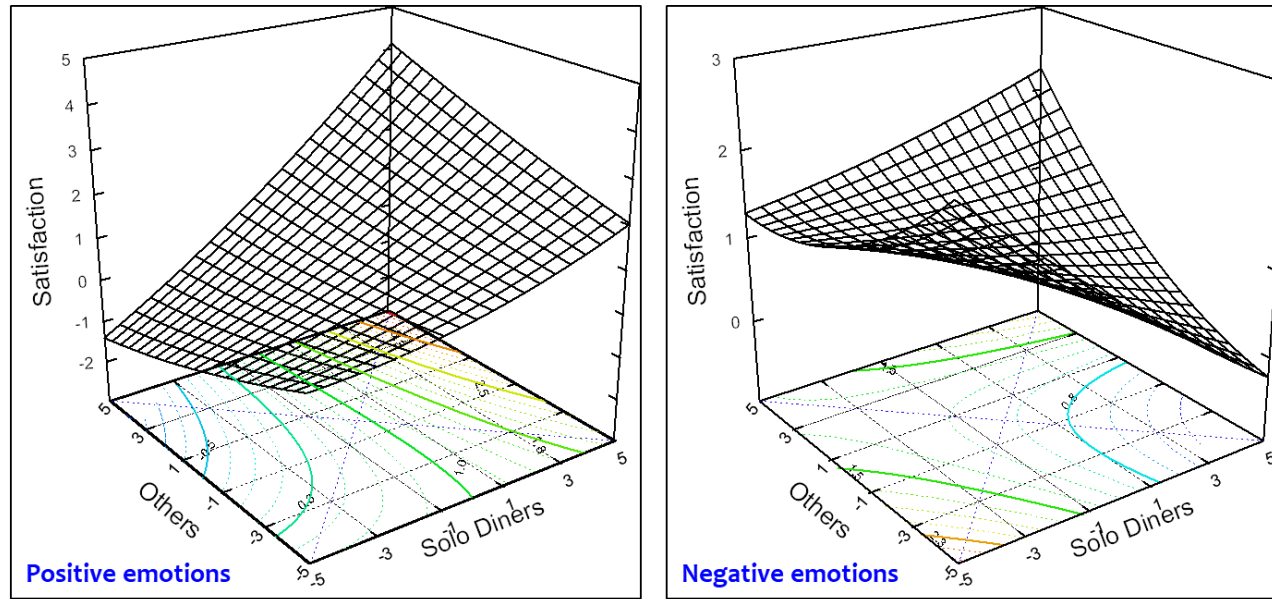


Table 5.

Polynomial regression analyses: testing the moderating effects of generations (Generation Z vs. Older generational group)

Dependent variable: solo dining satisfaction					
Model 1 (PE)			Model 2 (NE)		
	Unstandardized beta coefficients			Unstandardized beta coefficients	
	Step 1	Step 2		Step 1	Step 2
Constant (b ₀)	0.895***	0.900***	Constant (b ₀)	0.978***	0.989***
Gender	0.171	0.141	Gender	0.159	0.148
Frequency of solo dining	0.373***	0.352***	Frequency of solo dining	0.420***	0.411***
Solo diner PE (b ₁ X)	0.348***	0.241***	Solo diner NE (b ₁ X)	-0.098*	-0.005
PE of others (b ₂ Y)	0.004	0.085	NE of others (b ₂ Y)	0.054	0.022
Solo diner PE ² (b ₃ X ²)	0.013	0.014	Solo diner NE ² (b ₃ X ²)	0.004	0.013
Solo diner PE × PE of others (b ₄ XY)	0.041	0.037	Solo diner NE × NE of others (b ₄ XY)	0.039	0.045
PE of others ² (b ₅ Y ²)	0.005	0.012	NE of others ² (b ₅ Y ²)	0.017	0.013
Generation Z ^a (b ₆ W)		-0.188	Generation Z (b ₆ W)		-0.151
Solo diner PE × Generation Z (b ₇ XW)		0.362***	Solo diner NE × Generation Z (b ₇ XW)		-0.229*
PE of others × Generation Z (b ₈ YW)		-0.277**	NE of others × Generation Z (b ₈ YW)		0.065
Solo diner PE × PE of others × Generation Z (b ₉ XYW)		-0.020	Solo diner NE × NE of others ×Generation Z (b ₉ XYW)		-0.015
R ²	0.195	0.213	R ²	0.110	0.125
ΔR ² (ΔF)	0.017 (3.469**)		ΔR ² (ΔF)	0.015 (2.815*)	
Surface tests					
Along Y = X line (Generation Z)			Along Y = X line (Generation Z)		
Slope (a ₁ =b ₁ + b ₂)	0.416 (2.257**) ^a		Slope (a ₁ =b ₁ + b ₂)	-0.155 (-2.187*)	
Curvature (a ₂ =b ₃ + b ₄ + b ₅)	0.046 (1.953*)		Curvature (a ₂ =b ₃ + b ₄ + b ₅)	0.067 (2.649**)	
Along Y = - X line			Along Y = - X line		
Slope (a ₃ =b ₁ - b ₂)	0.803 (4.355**)		Slope (a ₃ =b ₁ - b ₂)	-0.352 (-4.964**)	
Curvature (a ₄ =b ₃ - b ₄ + b ₅)	0.019 (0.801)		Curvature (a ₄ =b ₃ - b ₄ + b ₅)	0.020 (0.790)	
Along Y = X line (Older)			Along Y = X line (Older)		
Slope (a ₁ =b ₁ + b ₂)	0.326 (6.769***)		Slope (a ₁ =b ₁ + b ₂)	0.018 (0.400)	
Curvature (a ₂ =b ₃ + b ₄ + b ₅)	0.063 (3.818**)		Curvature (a ₂ =b ₃ + b ₄ + b ₅)	0.069 (4.097**)	
Along Y = - X line			Along Y = - X line		
Slope (a ₃ =b ₁ - b ₂)	0.155 (3.213**)		Slope (a ₃ =b ₁ - b ₂)	-0.033 (-0.739)	
Curvature (a ₄ =b ₃ - b ₄ + b ₅)	-0.015 (-0.931)		Curvature (a ₄ =b ₃ - b ₄ + b ₅)	-0.042 (-2.484**)	

Notes: PE (positive emotion); NE (negative emotion); * $p < 0.05$, *** $p < 0.001$; ^a ΔR^2 indicates an increase in variance explained by adding the set of non-linear terms (X^2 , XY and Y^2) above the linear terms (X and Y); Generation Z; ^aolder generational group was used as the reference group; ^a number in parentheses are t -values; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 2.

Emotional congruence between solo diners and other diners: Generation Z vs. older generational group

