

혼밥이 건강한 메뉴 선택에 미치는 영향: 소비 목적 지향과 메뉴 영양 정보 표시의 역할

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Can Dining Alone Lead to Healthier Menu Item Decisions than Dining with Others? The Roles of Consumption Orientation and Menu Nutrition Information

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ABSTRACT

Objectives: Driven by a growth of single-person households and individualized lifestyles, solo dining in restaurants is an increasingly recognizable trend. However, a research gap exists in the comparison of solo and group diners' menu-decision making processes. Based on the self-control dilemma and the temporal construal theory as a theoretical framework, this study compared the ordering intentions of solo vs. group diners with healthy vs. indulgent (less healthy) entrées. The mediating role of consumption orientation and the moderating role of amount of menu nutrition information were further explored to understand the mechanism and a boundary condition.

Methods: A scenario-based online survey was developed using a 2 (dining social context: solo vs. with others) × 3 (amount of menu nutrition information: no nutrition information vs. calories vs. calories/fat/sodium), between-subjects, experimental design. Consumers' level of nutrition involvement was controlled. A nationwide survey data (n = 224) were collected from a crowdsourcing platform in the U.S. Data were analyzed using multivariate analysis of covariance, independent t-test, univariate analysis of covariance, and moderated mediation analyses.

Results: Findings reveal that solo (vs. group) diners have less (vs. more) intentions to order indulgent menu items due to a more utilitarian (vs. more hedonic) consumption orientation in restaurant dining. Findings also show that solo (vs. group) diners have more (vs. less) intentions to order healthy menu items when the restaurant menu presented nutrition information including calories, fat, and sodium.

Conclusions: The findings contribute to the literature of foodservice management, healthy eating, and consumer behavior by revealing a mechanism and an external stimuli of solo vs. group diners' healthy menu-decision making process in restaurants. Furthermore, the findings provide restaurateurs and health professionals with insights into the positive and negative impacts of menu nutrition labelling on consumers' menu-decisions.

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KEY WORDS solo dining, menu choice, healthy eating, self-control dilemma, temporal construal theory

INTRODUCTION

In most developed countries, the proportion of single person households is dramatically increasing while traditional, multi-person households are shrinking [1]. In the U.S., the number of single person households has reached 35 million (28%), the second largest type of household after two person households [2]. Single person households are the leading type of household in a survey of 28 European countries, accounting for one-third (34%) of total households [3]. The growth in single person households is expected to continue, such that they will exceed 40% of total households in many countries [1]. The growing number of singles is thought to be fueled by an increase in late marriages, divorces, widows and widowers, single elderly, and voluntary single life choices, which are related to extended lifespans and more individualized lifestyles [4, 5].

Parallel to this phenomenon, the number of solo restaurant diners is also growing. Research notes that solo consumers spend longer time periods outside the home during the day due to education or career responsibilities, dual-career demands, and reductions in size of social networks (in personal relationships, as well as community and social organizations) [4, 5]. In the hospitality and tourism industry, these phenomena have led to an increase in solo diners. In fact, consumers are eating alone in more than half of their dining occasions [6], and an increased number of parties of one are found in restaurants [7]. Considering the long-term potential of the solo dining population for driving market change and boosting sales in the industry, the unique characteristics of solo diners and their subsequent behavioral patterns compared to group diners warrant examination.

Previous studies examining the difference between solo and group diners' food consumption mostly focused on the amount of food consumed or the meal duration, in which the consumption did not occur in a restaurant setting (i.e., social facilitation of eating) [8]. Other studies on eating out alone have explored feelings and experiences of solo diners in-depth but the studies were limited to qualitative analyses of a few individuals [9, 10] or focused on a particular gender [11], lacking generalizability to a broader population. More recently, quantitative approaches have examined solo diners'

restaurant visit intentions [12], dining experiences [13], and anticipated satisfaction [14], yet the studies provided solo diners' perspectives only, lacking a comparison with group diners, thus their varying menu-decision making processes are not known.

Therefore, to address these research gaps, this study sought answers to the following questions: (1) Do solo diners in restaurants make different menu item decisions compared to group diners?; (2) If so, what are the underlying cognitive mechanisms that lead to the different menu decisions?; and (3) Are the different menu decisions contingent upon certain external conditions such as menu nutrition information? Specifically, consumer psychology studies in the marketing field often examine food choices by comparing relatively rational choices (i.e., healthier foods) to relatively more emotional choices (i.e., less healthy, more indulgent foods) [15]. Building on this literature, this study focused on how solo dining may lead to different preferences for healthier versus indulgent menu items compared to group dining.

This study's arguments are based primarily on the self-control dilemma and temporal construal theory. The self-control dilemma (or self-regulation) reflects the conflicts between the higher order, long-term goal with a future benefit and a lower order, short-term goal with an immediate benefit [16, 17]. Temporal construal theory describes that the activation of a distal temporal construal leads to greater self-control compared to the activation of a proximal temporal construal; that is, people's temporal focus on the future help them behave in a way that is more aligned with their long-term goals, resisting the temptation that yields immediate pleasure [16-19]. While these theories are well-established concepts in psychology and marketing literature and widely used in healthy vs. indulgent food consumption contexts [15, 20, 21], they have rarely been used in restaurant contexts. Thus, in application of these concepts, we propose that solo diners are more likely to select healthier (vs. indulgent) menu items than group diners based on the activation of a distal (vs. proximal) temporal construal resulting from the lack (vs. presence) of dining partners.

This study also assessed whether the effect is mediated by solo diners' pursuit of utilitarian (vs. hedonic) consumption orientation compared to group diners [5], and whether the effect is conditioned on the amount of nutrition information

in the menu [22]. That is, it is plausible that consumers with dining partners may enjoy more experiential dimensions of restaurant dining that result in pleasure and excitement (i.e., hedonic consumption), while solo dining may be more associated with calmness and the achievement of necessary goals such as fulfilling basic food needs (i.e., utilitarian consumption) [5, 23-28]. Such difference in consumption orientation between solo and group diners may lead to their different menu item decisions. Also, an external condition such as the provision of menu nutrition information may lead to different results of healthy choices for solo vs. group diners due to their increased awareness of healthy levels of menu items [22, 29-33]. Taken together, this study examined the effect of dining social context on healthy vs. indulgent menu item intentions, mediated by consumption orientation, and moderated by the amount of nutrition information on menus in a casual dining restaurant setting.

METHODS

1. Study design and data collection

The conceptual model is presented in Fig. 1. In order to test the model, a survey was developed using a 2 (dining social context: solo vs. group) × 3 (amount of menu nutrition

information: none vs. calories vs. calories/fat/sodium), between-subjects, experimental design. The group dining context was set to a typical party size of three to four people [34], thus ruling out some special contexts such as possible romantic dining with only two people or a larger meeting with many people. For the amount of nutrition information conditions, the “no nutrition information” condition served as a control group. Calorie disclosure by itself was offered as a minimum nutrition information condition (per U.S. menu regulations at the time). For the enhanced nutrition information condition, total fats and sodium, which are of “particular public health concern” in the U.S. [35], were presented in addition to calories.

The survey was launched online using Qualtrics software enabled for complete randomization of condition assignments. The initial survey was pilot tested by 16 respondents to check for the realism of scenarios, ease of use (i.e., ease of imagining oneself in the scenario), readability, overall logic and flow, grammar and formatting errors, and perceived healthiness of menu items. After addressing constructive comments from the pilot-test, data were collected at an online crowdsourcing platform widely used in social sciences studies (Amazon Mechanical Turk) [36]. Small incentives were provided to all participants for their completion of the survey. Eligible participants were limited to U.S. adult

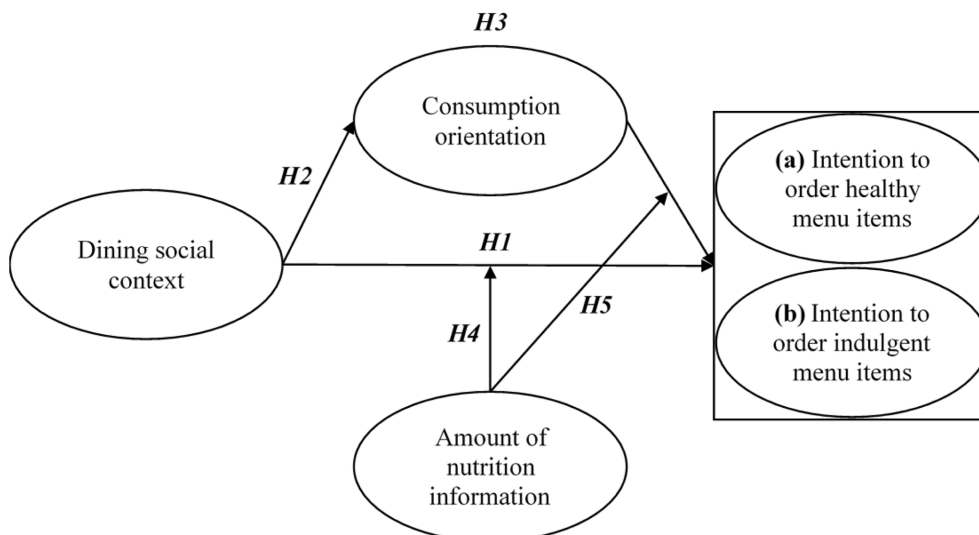


Fig. 1. The conceptual model

H1: Solo (vs. group) diners will have (a) a higher intention to order healthy menu items and (b) a lower intention to order indulgent menu items; H2: Solo (vs. group) diners will show a more utilitarian (vs. hedonic) orientation; H3: The consumption orientation will mediate the effect of dining social context on the intention to order (a) healthy and (b) indulgent menu items; H4: An increase in the amount of nutrition information will strengthen the effect of dining social context on the intention to order (a) healthy and (b) indulgent menu items; and H5: An increase in the amount of nutrition information will strengthen the indirect effect of dining social context on the intention to order (a) healthy and (b) indulgent menu items through a consumption orientation.

consumers with restaurant dining experiences within the last three months to better target the population of interest. This research was determined exempt of review from the Purdue University Institutional Review Board (IRB Protocol # 1703018929).

2. Procedure and measurement

The survey was comprised of three sections: (1) experiment manipulations and measurement variables; (2) control variables and dining out experiences; and (3) demographics. More specifically, in the first part, participants were instructed to imagine having lunch at a nearby restaurant with a randomly assigned condition of eating by oneself or with a couple of others (see Fig. 2 for full descriptions). The scenario presented an ordinary lunch occasion at a casual-style restaurant to increase external validity in terms of generalizability and constrained several dining conditions to control for any potential confounders (e.g., day, mealtime, motive, and location). The description of the casual-style restaurant, average check size, and some examples of national chain restaurants were provided for effective manipulations. Following the scenarios, consumption

orientation was measured by asking how they would describe the orientation of the restaurant meal described in the scenario with a 7-point scale (1 = completely utilitarian to 7 = completely hedonic; measure adopted from Ratner & Hamilton, 2010). In order to enhance participants' understanding, a utilitarian orientation was described as "functional, task-oriented, to satisfy basic food needs", and a hedonic orientation was described as "emotional, fun-oriented, to enjoy a pleasurable dining out experience" [5].

Next, one of three virtual restaurant menus with differing amounts of nutrition information was randomly presented to each participant: none vs. calories vs. calories/fat/sodium (see a sample menu in Fig. 3). The menus were developed to induce more realistic responses. The menus contained information about entrée items, food descriptions, and nutrient content (except for the control menu), all of which were obtained from actual menus of nationwide casual-dining chains (e.g., Applebee's®, Denny's®, and Chili's®). The entrée menu items consisted of three healthy (grilled chicken salad, classic turkey sandwich, herb-grilled salmon) and three less healthy and more indulgent items (double cheeseburger, country-fried steak, Cajun shrimp pasta). In selection of the

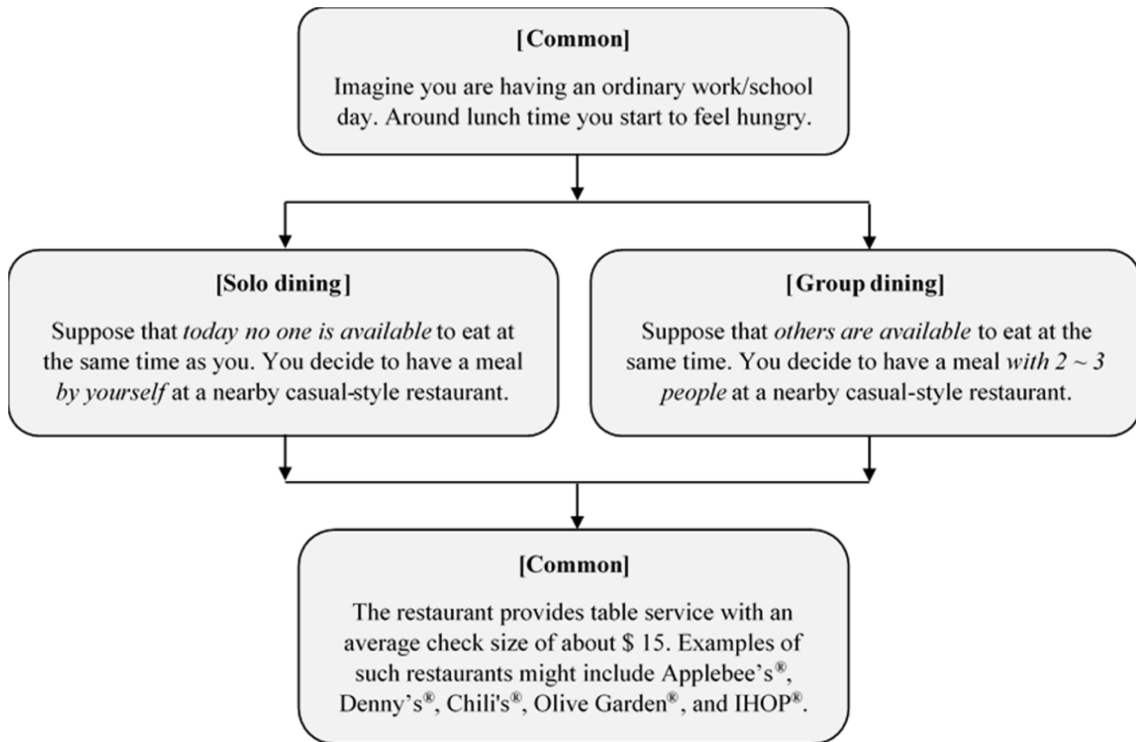


Fig. 2. Flow of experiment manipulation scenarios of dining social context



Fig. 3. A virtual menu used in the study for the calories, fat, and sodium condition

specific menu items, general popularity of the items in the real restaurants and previous use in relevant studies were considered [37, 38]. A variety of protein sources such as beef, poultry, and seafood were also presented to minimize food preference biases in menu item choices. Menu item nutrient content was confirmed by a registered dietitian in the U.S. and a licensed dietitian from another country, so that the healthiness level of menu items was clearly supported by the calorie and nutrient contents. Further, the nutritional differences were thought to be clearly presented on the menus as the less healthy, indulgent items were about double the calorie, fat, and sodium content of the healthy menu items (i.e., healthy

items: ≤ 540 calories, ≤ 31 g fat, $\leq 1,130$ mg sodium vs. indulgent items: $\geq 1,190$ calories, ≥ 59 g fat, $\geq 2,260$ mg sodium). The levels of calorie, fat, and sodium content of the less healthy, indulgent menu items also exceeded half of the Daily Values based on a 2,000-calorie diet, which is used for general nutrition advice (i.e., 2,000 calories, < 65 g fat, $< 2,400$ mg sodium per day) [39], indicating a lower healthiness level of the foods. Prices were not shown and instructions stated that price should not be considered in decision making.

Following the menu presentation, a manipulation check question was asked to determine whether participants were

aware of the absence/presence of nutrition information, and types of nutrient information, if it was offered. Next, after participants were asked to select two of their favorite items from each of three healthy and three indulgent item sets, they were asked their intention of ordering (1) their favorite healthy item and (2) their favorite indulgent item among the six entrée items on the menu. Measurement included three statements for each ordering intention (e.g., “I intend to order this menu item”; Cronbach’s $\alpha = 0.98$ for healthy item intentions and 0.99 for less healthy item intentions, confirming the successful reliability of the measures) on a 7-point Likert scale [40].

In the second part of the survey, questions for attention checks, a control variable, and dining out experiences were provided. Attention check questions were included to sort out participants who were not carefully reading the questions. The level of agreement with five statements about nutrition involvement [41], measured on a 7-point scale (1 = strongly disagree to 7 = strongly agree), was used as a control variable. The level of nutrition involvement was statistically held constant across participants to rule out its confounding effect (e.g., eating healthy items regardless of solo vs. group dining conditions due to a high level of nutrition involvement). Statements included “I pay close attention to nutrition information” (Cronbach’s $\alpha = 0.93$). Finally, in the last section of the survey, demographic information such as age, gender, race/ethnicity, education and income levels were collected. Data were analyzed using IBM SPSS Statistics 23 (IBM Corporation, Armonk, NY, USA).

RESULTS

1. Sample characteristics

After excluding 34 participants due to incomplete surveys, short survey response times (<two min), and incorrect answers due to attention or manipulation check questions (such as whether cholesterol information was presented in the menu), 224 responses were used in the final sample. Accordingly, the six cell sizes ranged from 35 to 42 (Table 2). Respondents ranged from 19 to 75 years old (38.14 ± 11.80), were 50.9% female, and mostly Caucasians (82.1%; followed by 6.3% Asian, 5.8% African American, and 4.5% Hispanic or Latino). The largest category for education was a

bachelor’s degree (42.9%). Most commonly, annual household income was \$ 20,000 to \$ 80,000 (66.0%; with a median between \$ 50,000 and \$ 80,000).

In regard to dining experience, most participants reported eating in casual dining restaurants one or more times per week (15.2%) or two to three times per month (42.4%). The vast majority (80.4%) also reported they had dined alone in a restaurant, with 36.7% saying one or more times per month ($n = 180$), reflecting the growing prevalence of solo dining in restaurants. Of those who had experienced solo dining, the most common types of restaurants for solo dining were fast-casual restaurants (66.7%) and fast-food restaurants (65.6%), followed by casual dining restaurants (41.7%) and fine dining restaurants (5.6%). The main reason for dining alone in restaurants was a personal desire for time alone (35.6%) or convenience (35.6%), rather than situational contexts where no one was available to dine with at the moment (25.0%).

In general, one-sample *t*-test results showed that participants were interested in nutrition information ($M = 4.89 > 4$, $P < 0.001$). This variable was controlled in the subsequent data analyses. In regards to the perceived adequacy of the provided amount of nutrition information (1 = completely inadequate, 7 = completely adequate), paired sample *t*-test results revealed that participants who saw labeling that included calories, fat, and sodium perceived the nutrition information to be significantly more adequate (5.96 ± 1.29) than participants who only saw calorie information (4.84 ± 1.59 , $P < 0.001$). Among the three healthy and three indulgent menu items, participants most preferred the grilled chicken salad (34.8%) and the double cheeseburger (45.5%), respectively.

2. Intentions to order healthy and indulgent menu items

Dining social context. The results of one-way multivariate analysis of covariance (MANCOVA) showed that intentions to order healthy and less healthy, indulgent menu items did not differ significantly by dining social context alone ($P = 0.94$). The patterns revealed the proposed directions such that solo diners had greater healthy item intentions and group diners had greater indulgent item intentions, but the mean differences were minimal (i.e., healthy item intentions: 5.82 for solo vs. 5.76 for group; indulgent item intentions: 4.64 for solo vs. 4.67 for group). Thus, H1(a) and H1(b)

suggesting the single effect of dining social context on healthy and indulgent item intentions, respectively, were not supported.

Mediation through consumption orientation. The results of the independent group t-test showed that the consumption orientation varied significantly across dining social context ($P < 0.001$; Table 1). As proposed, solo diners were more oriented to utilitarian consumption in restaurants (3.52 ± 1.65), while group diners were more oriented to hedonic consumption in restaurants (4.32 ± 1.52). Thus, H2 suggesting the effect of dining social context on consumption orientation was supported.

Next, mediation analyses of consumption orientation were conducted using the PROCESS syntax macro (PROCESS model 4) [42]. The macro computed bias-corrected bootstrap confidence intervals for indirect effects from 10,000 bootstrap samples. The results of the mediation analysis on the effect of dining social context on healthy item intentions showed that the consumption orientation was not a significant mediator (indirect effect = 0.003, 95% CI = -0.10 to 0.09). Thus, H3(a) suggesting the indirect path of dining social context on healthy item intentions through consumption orientation was not supported.

On the other hand, the consumption orientation signifi-

cantly mediated the effect of dining social context on indulgent item intentions (indirect effect = 0.18, 95% CI = 0.05 to 0.39). Fig. 4 presents the path coefficients, standard errors, and significance levels of the mediation mechanism. As expected, the mediation indicated that group diners had a greater intention to order indulgent items compared to solo diners through their stronger hedonic consumption orientation; or, conversely, solo diners had a lower intention to order indulgent items than group diners due to their less hedonic (more utilitarian) consumption orientation. Thus, H3(b) suggesting the mediating role of consumption orientation in the effect of dining social context on indulgent item intentions was supported.

Moderation of amount of nutrition information. The results of two-way MANCOVA showed that there is evidence that intentions to order healthy or indulgent menu items would differ by the interaction of dining social context and the amount of nutrition information ($P = 0.066$). Therefore, two-way univariate analyses of covariance (ANCOVA) on each dependent measure was conducted to further explore the interactions.

The ANCOVA results of healthy item intentions showed that the interaction of dining social context and the amount of nutrition information was significant ($P = 0.019$; Table 2 and Fig. 5). More specifically, the post-hoc comparison tests of cell means showed that solo diners had a significantly greater intention to order healthy menu items compared to group diners when calories, fat, and sodium information were presented on the menu (6.12 for solo vs. 5.37 for group, $P = 0.018$). In comparison, the healthy item intentions of solo and group diners were not significantly different from each

Table 1. Consumption orientation results according to dining social context conditions

Dining social context	Consumption orientation ¹⁾	P-value ²⁾
Solo (n = 107)	3.52 ± 1.65	< 0.001
Group (n = 117)	4.32 ± 1.52	

Mean ± SD

1) Scale: 1 = completely utilitarian to 7 = completely hedonic

2) Data were analyzed using independent group t-test.

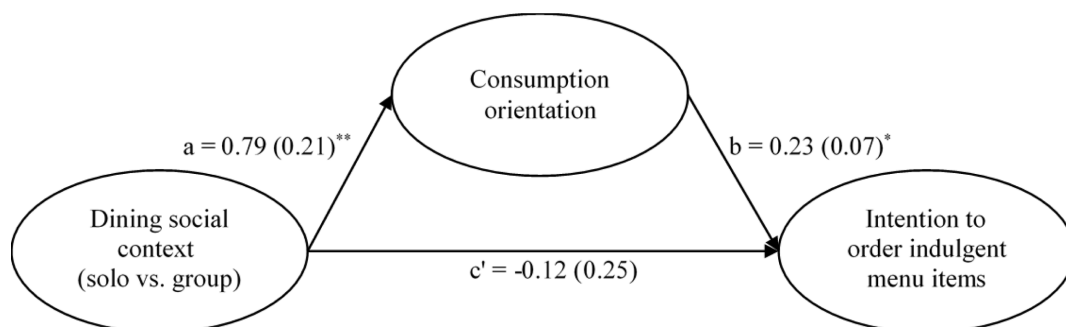


Fig. 4. The indirect effect of dining social context on indulgent item intention through consumption orientation. Data were analyzed using PROCESS syntax macro based on bootstrapping and multiple regressions. The path coefficients, standard errors, and significance levels of each relationship are indicated as a, b, and c'. * $P < 0.01$, ** $P < 0.001$.

Table 2. Healthy and indulgent item ordering intention between dining social context conditions according to the amount of menu nutrition information

Dependent measures ¹⁾	No information		Calories		Calories/fat/sodium		P-value ²⁾
	Solo (n = 36)	Group (n = 38)	Solo (n = 35)	Group (n = 42)	Solo (n = 36)	Group (n = 37)	
Healthy item ordering intention	5.52 ± 0.23 ¹⁾	6.02 ± 0.22	5.83 ± 0.23	5.86 ± 0.21	6.12 ± 0.23 ^a	5.37 ± 0.22 ^b	0.019
Indulgent item ordering intention	5.09 ± 0.30	4.60 ± 0.29	4.41 ± 0.30	4.61 ± 0.28	4.41 ± 0.30	4.81 ± 0.30	0.291

Adj. Mean ± SE (calculated using ANCOVA, adjusted for the level of nutrition involvement.)

1) Scale: 1 = strongly disagree to 7 = strongly agree.

2) Data were analyzed using 2 × 3 ANCOVA tests, and values with different superscripts showed a significant difference in the post-hoc comparison tests.

other when only calorie information was provided (5.83 for solo vs. 5.86 for group, $P=0.91$) as well as when no nutrition information was provided (5.52 for solo vs. 6.02 for group, $P=0.11$). Thus, H4(a) suggesting the strengthening role of the amount of nutrition information on the effect of dining social context on healthy item intentions was supported.

On the other hand, the patterns of less healthy, indulgent item intentions of solo and group diners across the amount of nutrition information conditions were consistent with the proposed directions, meaning that group diners showed greater intentions to order indulgent items compared to solo diners as the amount of nutrition information increased (Table 2). However, the interaction effect failed to attain statistical significance ($P=0.291$). Hence, H4(b) suggesting the facilitating role of the amount of nutrition information on the effect of dining social context on indulgent item intentions was not supported.

Moderated mediation analyses. Lastly, moderated mediation analyses in which consumption orientation was a mediator and the amount of nutrition information was a moderator for each of the healthy and indulgent menu item intentions were conducted using the PROCESS syntax macro (PROCESS model 15) [42]. However, the results showed that indices of moderated mediation for both healthy and indulgent item intentions were not statistically significant (i.e., 95% confidence intervals contained zeros), indicating that the mediations through consumption orientation did not significantly vary across the different amounts of nutrition information. Therefore, H5(a) and H5(b) suggesting the stronger indirect effects through consumption orientation with an increased amount of nutrition information were not supported. In other

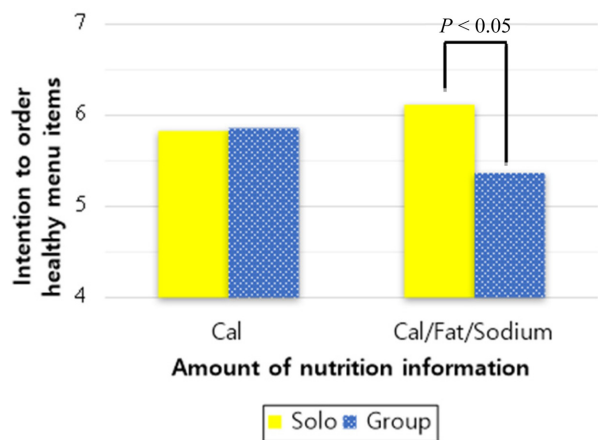


Fig. 5. The interaction effect of dining social context and the amount of nutrition information on healthy item intention Scale: 1 = strongly disagree to 7 = strongly agree; Cal = calories; Solo = solo dining; Group = group dining. Data were analyzed using ANCOVA and the subsequent post-hoc comparison tests of cell means.

words, the indirect effects of dining social context on healthy and indulgent item intentions through consumption orientation were consistent or did not vary significantly across the amount of nutrition information conditions.

DISCUSSION

Driven by the increasing popularity of solo dining, this study examined the effect of dining social context (solo vs. group dining) on healthier and less healthy, indulgent menu item choices in casual dining restaurants based on the self-control dilemma and temporal construal theory. Furthermore, the mediating role of consumption orientation (utilitarian vs. hedonic) and the moderating role of the amount of menu nutrition information in the decision-making process were also examined. The findings showed that: first, solo diners

are more likely to be oriented to a utilitarian consumption, while group diners are more likely to be oriented to a hedonic consumption; and second, controlling for the level of nutrition involvement, solo diners are more likely to eat healthier foods in restaurants than group diners. More specifically, solo (vs. group) diners showed (1) lower (vs. higher) intentions to order less healthy, indulgent items due to a utilitarian (vs. hedonic) consumption orientation, irrespective of menu nutrition information conditions, and (2) higher (vs. lower) intentions to order healthy items when the menu included calorie, fat, and sodium information about the menu items.

The findings offer useful information to both researchers and managers by examining the menu-decision making processes of solo and group diners, particularly regarding healthy vs. indulgent menu items, by exploring the roles of consumption orientation and nutrition information on menus. Theoretically, the findings contribute to an enhanced knowledge of solo diners' menu-decision making processes compared to group diners in restaurants. Previous studies on solo dining examined only solo diners' restaurant visiting intentions [12], general dining experiences and feelings [9-11, 13], and anticipated satisfaction [14]. This study compared solo diners with group diners and showed how the dining social context leads to different menu choices with varying levels of healthiness.

Specifically, findings confirmed that solo diners seek more utilitarian consumption experiences, while group diners seek more hedonic consumption experiences, consistent with prior hospitality and consumer studies [5, 28]. Furthermore, the activation (vs. deactivation) of hedonic orientation in group (vs. solo) diners subsequently resulted in stronger (vs. weaker) intentions of ordering less healthy, indulgent menu items, supported by healthy food choice studies [21, 23]. In regard to the amount of menu nutrition information conditions, the disclosure of more nutrition information such as fats and sodium in addition to calories strengthened the effect of dining social context on healthy menu item intentions (i.e., a stronger intentions of solo diners and less intentions of group diners) compared to no or only calorie information conditions, congruent with previous nutrition labeling studies highlighting the differential impacts of nutrition labeling for different consumers [22, 29, 30].

Specifically, the finding that disclosing more nutrition information leading to more healthy choices for some consumers and less healthy choices for the other consumers is similar to Byrd et al. [43], which found that disclosing more nutrition (sodium) information led to healthier (low sodium) choices for consumers with a positive taste intuition and less healthier (high sodium) choices for consumers with a negative taste intuition. This finding may be of importance to the public health studies and practices.

It is also important to note the differential impacts of eating alone on healthy eating results depending on the contexts. That is, several health studies have pointed out unhealthy dietary behaviors (e.g., skipping the meal), unhealthy weight status (i.e., overweight or underweight), or increased likelihood of abdominal obesity and metabolic syndrome among men who frequently eat alone [44, 45]. Other studies reported mixed associations between healthy or unhealthy dietary intakes and the elderly individuals living alone who also likely eat alone frequently [46, 47]. It may be also possible that solo diners with a primary goal of convenience would rather choose quick-service restaurants as a dining place and eat more processed fast foods that are less likely to be healthy. However, using self-control concepts, we showed that people are more likely to make healthier choices when dining alone than dining together when eating alone occurs in a full-service restaurant context. This finding is congruent with an interview study which showed that people associates healthy eating in restaurants with solo than group dining due to an increased self-control ability when alone [48].

On the other hand, the findings also revealed noteworthy non-differences. First, while the results were consistent with the hypothesized directions (i.e., solo diners' stronger preferences for healthy items, group diners' stronger preferences for indulgent items), the single effect of dining social context was not statistically significant in terms of the menu item ordering intentions of solo and group diners. We found that this effect was in fact qualified by the significant interaction between dining social context and the amount of nutrition information, and thus, it is essential to consider the nutrition information conditions in the interpretation of the findings. More specifically, the effect of dining social context on healthy item intentions was contingent upon the amount of nutrition information conditions such that differences in

ordering intentions were not statistically significant until the menu provided calories, fats, and sodium information. That is, a greater amount of nutrition information on the menu allowed solo diners to accomplish their healthier choice goal as compared to group diners. This finding may be a concern for the current nutritional labeling policy in restaurants (i.e., mandatory calorie labeling in chain restaurants) [31] in that the provision of only calorie information, including no information, may be not enough to inform consumers of the healthiness or unhealthiness values of the meals they intend to have.

Second, it is important to note that the mechanism leading to an intention to select healthy menu items is different from the mechanism that leads to an intention to select less healthy, more indulgent menu items, as well as the interactions of the nutrition information with these mechanisms. Consumption orientation was only a significant mediator for the effect of dining social context on indulgent menu item intentions, but not for the effect on healthy menu item intentions. In other words, a hedonic (vs. utilitarian) consumption orientation led to more (vs. less) indulgent item intentions but a utilitarian (vs. hedonic) consumption orientation did not necessarily lead to more (vs. less) healthy item intentions. On the other hand, the amount of nutrition information only affected the impact of dining social context on healthy menu item intentions, not indulgent menu item intentions. Thus, these findings provide a new understanding beyond earlier marketing studies that considered the decision-making processes between healthy vs. indulgent foods as merely dichotomous and opposite [20, 23]. The findings especially point to the need for more research in healthy vs. indulgent food decisions using different mechanisms for each of the selection of healthy and indulgent foods. Lastly, the indirect effects of dining social context on healthy and indulgent item intentions through consumption orientation were stable across the amount of nutrition information conditions. Thus, the finding notes that, while an increase in the amount of nutrition information helps the healthy item decisions of consumers with preferences for healthy menu items (i.e., solo diners in this study setting), it does not necessarily facilitate the healthy vs. indulgent choices of utilitarian vs. hedonic consumption-oriented consumers (e.g., hedonic consumption-oriented group diners pursuing indulgent items).

For restaurateurs, findings highlight the relative utilitarian values of solo diners in comparison to the relative hedonic values of group diners, subsequent indulgent meal preferences of group diners in general, and healthy meal preferences of solo diners when more nutrition information is provided on menus. Restaurateurs thus can obtain operational insights from the findings into the impacts of the voluntary labelling of additional nutrition information beyond calories on restaurant menus or their mandatory labelling in certain areas (e.g., fat, sodium, and carbohydrates in Oregon State) [49]. It is said that the best restaurant menus are the ones that provides a variety of choices to meet both healthy and indulgent meal interests of diverse consumers. However, a focus on healthier menu offerings might be particularly valuable for restaurants that specifically expect a higher percentage of solo diners, such as those located in or close to airports and conference centers for solo business travels and university towns for routine convenience solo diners, to fulfill their utilitarian and healthy eating goals. The disclosure of more nutrition information would be a plus for the segment to clearly identify the healthiness of the meals and to show more preferences for those items. On the other hand, restaurants primarily targeting couples, families, and friends, such as those located in holiday travel destinations, amusement parks, and higher-end casual dining restaurants for holiday or celebratory dining, may largely benefit from a wide range of indulgent menu offerings that can satisfy the hedonic consumption goals of the group diners. The provision of calorie or additional nutrition information on menus may possibly draw the group diners' attention on indulgent menu items. Thus, each restaurant should decide on the amount of nutrition information they wish to provide on menus depending on the customer mix of group to solo diners for maximum profits as well as the government regulations.

Several limitations need to be noted in understanding the findings of this study. First, vegetarian menu options were not considered in this study. Considering that only 5% of American adults identify themselves to be vegetarians [50], animal protein sources were used in our menu. However, as vegetarian meals are growing in popularity and respect for diverse food preferences is important, it would be worth examining how the inclusion of vegetarian menu options could impact the current findings. Second, while this study

limited itself to the setting of a casual dining restaurant to increase the internal validity of the study, whether healthy eating outcomes vary with other types of restaurants is worth further investigation. Lastly, future studies may wish to vary the composition of dining partners in group dining and examine how it impacts the differences between solo and group dining. While this study set the group dining context to eating with two to three, generalized dining partners based on the most common party size in restaurants, other research may wish to focus on group dining with larger groups or different dining contexts such as romantic couples vs. business dining groups vs. family groups. In these contexts, social norms or impression management mechanisms may be of consideration to determine group diners' varying preferences.

CONCLUSIONS

This study addressed answers to the research questions of: (1) Do solo diners in restaurants make different menu item decisions compared to group diners? – Yes; (2) If so, what are the underlying cognitive mechanisms that lead to the different menu decisions? – Different consumption orientations; and (3) Are the different menu decisions contingent upon certain external conditions such as menu nutrition information? – Yes. In summary, the findings showed solo (vs. group) diners' lower (vs. higher) intentions to order less healthy, indulgent menu items through a utilitarian (vs. hedonic) consumption orientation mechanism, and higher (vs. lower) intentions to order healthy menu items when nutrition information including calorie, fat, and sodium content was presented on the menu. Thus, while one might consider solo dining as unhealthy and negative experiences due to a lack of the joy of dining with company, this study showed that solo dining may rather lead to healthier choices through a greater self-control and a utilitarian, goal-oriented mindset. Plus, the solo mealtime may be blissful with an unexpected joy of dining with an important but neglected company: yourself!

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REFERENCES

1. OECD International Futures Programme. The future of families to 2030: Projections, policy challenges, and policy options. A synthesis report [internet]. Paris, France: OECD Publications; 2011 [cited 2021 May 1]. Available from: <https://www.oecd.org/futures/49093502.pdf>.
2. U.S. Census Bureau. Table HH-4. Households by size: 1960 to present [internet]. 2018 [cited 2021 May 1]. Available from: <https://www.census.gov/data/tables/time-series/demo/families/households.html>.
3. Eurostat. Household size [internet]. 2019 [cited 2021 May 1]. Available from: https://ec.europa.eu/eurostat/statistics-explained/index.php/Household_composition_statistics#Household_size.
4. Goodwin C, Lockshin L. The solo consumer: Unique opportunity for the service marketer. *J Serv Mark* 1992; 6(3): 27-36.
5. Ratner RK, Hamilton RW. Inhibited from bowling alone. *J Consum Res* 2015; 42(2): 266-283.
6. McLynn K. Consumers are alone over half of eating occasions as a result of changing lifestyles and more single-person households [internet]. The NPD Group; 2014 [cited 2021 May 1]. Available from: <https://www.npd.com/wps/portal/npd/us/news/press-releases/consumers-are-alone-over-half-of-eating-occasions-as-a-result-of-changing-lifestyles-and-more-single-person-households-reports-npd/>.
7. PR Newswire. OpenTable study reveals rise in solo dining [internet]. 2015 [cited 2021 May 1]. Available from: <http://www.prnewswire.com/news-releases/opentable-study-reveals-rise-in-solo-dining-300155418.html>.
8. Herman CP. The social facilitation of eating. A review. *Appetite* 2015; 86: 61-73.
9. Danesi G. Pleasures and stress of eating alone and eating together among French and German young adults. *Menu J Food Hosp Res* 2012; 1: 77-91.
10. Heimtun B. The holiday meal: Eating out alone and mobile emotional geographies. *Leisure Stud* 2010; 29(2): 175-192.
11. Lahad K, May V. Just one? Solo dining, gender and temporal belonging in public spaces. *Sociol Res Online* 2017; 22(2): 176-186.
12. Her ES, Seo SB. Why not eat alone? The effect of other consumers on solo dining intentions and the mechanism. *Int J Hosp Manag* 2018; 70: 16-24.
13. Hwang Y, Shin J, Mattila AS. So private, yet so public: The impact of spatial distance, other diners, and power on solo dining experiences. *J Bus Res* 2018; 92: 36-47.
14. Shin J, Hwang Y, Mattila AS. Dining alone? Solo consumers' self-esteem and incidental similarity. *J Serv Mark* 2018; 32(6): 767-776.
15. Gardner M, Wansink B, Kim J, Park SB. Better moods for better eating: How mood influences food choice. *J Consum Psychol* 2014; 24(3): 320-335.
16. Baumeister RF. Yielding to temptation: Self-control failure, impulsive purchasing, and consumer behavior. *J Consum Res* 2002; 28(4): 670-676.

17. Kivetz R, Keinan A. Repenting hyperopia: An analysis of self-control regrets. *J Consum Res* 2006; 33(2): 273-282.
18. Fujita K, Trope Y, Liberman N, Levin-Sagi M. Construal levels and self-control. *J Pers Soc Psychol* 2006; 90(3): 351-367.
19. Trope Y, Liberman N. Construal-level theory of psychological distance. *Psychol Rev* 2010; 117(2): 440-463.
20. Fedorikhin A, Patrick VM. Positive mood and resistance to temptation: The interfering influence of elevated arousal. *J Consum Res* 2010; 37(4): 698-711.
21. van Beek J, Handgraaf MJ, Antonides G. Time orientation and construal level: Effects on eating and exercising behaviour and preferences. *Int J Consum Stud* 2017; 41(1): 54-60.
22. Yoon HJ, George T. Nutritional information disclosure on the menu: Focusing on the roles of menu context, nutritional knowledge and motivation. *Int J Hosp Manag* 2012; 31(4): 1187-1194.
23. Werle CO, Wansink B, Payne CR. Is it fun or exercise? The framing of physical activity biases subsequent snacking. *Mark Lett* 2015; 26(4): 691-702.
24. Nguyen TVT, Ryan RM, Deci EL. Solitude as an approach to affective self-regulation. *Pers Soc Psychol Bull* 2018; 44(1): 92-106.
25. Dhar R, Wertenbroch K. Consumer choice between hedonic and utilitarian goods. *J Mark Res* 2000; 37(1): 60-71.
26. Ha J, Jang SS. Perceived values, satisfaction, and behavioral intentions: The role of familiarity in Korean restaurants. *Int J Hosp Manag* 2010; 29(1): 2-13.
27. Khan U, Dhar R, Wertenbroch K. A behavioral decision theory perspective on hedonic and utilitarian choice. In: Ratneshwar S, Mick DG, editors. *Inside consumption: Consumer motives, goals, and desires*. London and New York: Routledge; 2005. p. 144-165.
28. Ponnampalana A, Balaji MS. Matching visitation-motives and restaurant attributes in casual dining restaurants. *Int J Hosp Manag* 2014; 37: 47-57.
29. Kozup JC, Creyer EH, Burton S. Making healthful food choices: The influence of health claims and nutrition information on consumers' evaluations of packaged food products and restaurant menu items. *J Mark* 2003; 67(2): 19-34.
30. Wei W, Miao L. Effects of calorie information disclosure on consumers' food choices at restaurants. *Int J Hosp Manag* 2013; 33: 106-117.
31. U.S. Food and Drug Administration. Menu labeling requirements [internet]. 2019 [cited 2021 May 1]. Available from: <https://www.fda.gov/food/food-labeling-nutrition/menu-labeling-requirements>.
32. Howlett EA, Burton S, Bates K, Huggins K. Coming to a restaurant near you? Potential consumer responses to nutrition information disclosure on menus. *J Consum Res* 2009; 36(3): 494-503.
33. Droms C. When I go out to eat I want to enjoy myself: An investigation into consumers' use of nutrition information. *Adv Consum Res* 2006; 33(1): 282-283.
34. Thompson GM. Mythical revenue benefits of reducing dining duration in restaurants. *Cornell Hosp Q* 2009; 50(1): 96-112.
35. U.S. Department of Health and Human Services & U.S. Department of Agriculture. 2015 – 2020 Dietary Guidelines for Americans. 8th ed [internet]. 2015 [cited 2021 May 1]. Available from: <https://health.gov/dietaryguidelines/2015/guidelines/>.
36. Chandler J, Shapiro D. Conducting clinical research using crowdsourced convenience samples. *Annu Rev Clin Psychol* 2016; 12: 53-81.
37. Chernev A, Gal D. Categorization effects in value judgments: Averaging bias in evaluating combinations of vices and virtues. *J Mark Res* 2010; 47(4): 738-747.
38. Lee K, Conklin M, Cranage DA, Lee S. The role of perceived corporate social responsibility on providing healthful foods and nutrition information with health-consciousness as a moderator. *Int J Hosp Manag* 2014; 37: 29-37.
39. U.S. Food and Drug Administration. Nutrition facts label [internet]. n.d. [cited 2021 May 1]. Available from: <https://www.accessdata.fda.gov/scripts/interactivenutritionfactslabel/#intro>.
40. Kwon S, Jang SS. Price bundling presentation and consumer's bundle choice: The role of quality certainty. *Int J Hosp Manag* 2011; 30(2): 337-344.
41. Chandon P, Wansink B. The biasing health halos of fast-food restaurant health claims: Lower calorie estimates and higher side-dish consumption intentions. *J Consum Res* 2007; 34(3): 301-314.
42. Hayes AF. *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York: Guilford Press; 2013.
43. Byrd K, Almanza B, Ghiselli RF, Behnke C, Eicher-Miller HA. Adding sodium information to casual dining restaurant menus: Beneficial or detrimental for consumers? *Appetite* 2018; 125: 474-485.
44. Kwon AR, Yoon YS, Min KP, Lee YK, Jeon JH. Eating alone and metabolic syndrome: A population-based Korean National Health and Nutrition Examination Survey 2013–2014. *Obes Res Clin Pract* 2018; 12(2): 146-157.
45. Tani Y, Kondo N, Takagi D, Saito M, Hikichi H, Ojima T et al. Combined effects of eating alone and living alone on unhealthy dietary behaviors, obesity and underweight in older Japanese adults: Results of the JAGES. *Appetite* 2015; 95: 1-8.
46. Charlton KE. Elderly men living alone: Are they at high nutritional risk? *J Nutr Health Aging* 1999; 3(1): 42-47.
47. Pearson JM, Schlettwein-Gsell D, van Staveren W, de Groot LCPGM. Living alone does not adversely affect nutrient intake and nutritional status of 70- to 75-year-old men and women in small towns across Europe. *Int J Food Sci Nutr* 1998; 49(2): 131-139.
48. Takeda W, Melby MK. Spatial, temporal, and health associations of eating alone: A cross-cultural analysis of young adults in urban Australia and Japan. *Appetite* 2017; 118: 149-160.
49. Oregon Health Authority. Menu labeling law: For restaurants [internet]. n.d. [cited 2021 May 1]. Available from: <https://www.oregon.gov/oha/PH/PreventionWellness/Nutrition/MenuLabeling/Pages/restaurants.aspx>.
50. Hrynowski Z. What percentages of Americans are vegetarian? [internet]. Gallup; 2019 [cited 2021 May 1]. Available from: <https://news.gallup.com/poll/267074/percentage-americans-vegetarian.aspx>.