

Do Pictures Help? The Effects of Pictures and Food Names on Menu Evaluations

ABSTRACT

Presenting pictures along with food names on menus is a common practice in the restaurant industry. However, it is not clear whether adding pictures to menus always leads to positive effects. In addition, since more restaurant practitioners are creating ambiguous names for their dishes, it is valuable to study how pictures with different types of food names impact customers' attitudes and behavioral outcomes. In the current study, we examine the joint effect of pictures, food names, and individuals' information processing styles on consumers' attitudes, willingness to pay, and purchase intentions. The results reveal that for common descriptive food names, adding pictures have a positive effect on consumers' attitudes toward the menu item, their willingness to pay and their purchase intentions. More interestingly, for ambiguous food names, pictures have a positive effect only among verbalizers. Visualizers exhibit less favorable attitudes and behavioral outcomes after viewing ambiguously-named dishes with pictures than those without pictures.

Key Words: menu design; picture effect; food names; consumer information processing style

INTRODUCTION

In the restaurant industry, especially in the fast food and casual dining restaurants in the U.S., menus often feature pictures of items along with their names to convey additional information and increase sales. Unlike dish names, pictures typically occupy a large part of limited and precious menu space. Although many hospitality scholars have studied restaurant menu design (e.g., Bowen and Morris, 1995; Kincaid and Corsun, 2003; Kreul, 1982; Miner, 1996; Naipaul and Parsa, 2001; Pavesic, 2005; Reynolds et al., 2005; Yang et al., 2009), the extant literature provides little guidance on the effectiveness of presenting pictures along with verbal information on menus. Marketing scholars have focused on the effect of pictures in marketing communications, especially in advertising. However, the results are mixed regarding the effects of adding pictures to verbal information (Wyer et al., 2008). In the current study, we argue that the verbal information on menus (i.e., food names) may moderate the effect of pictures on restaurant menus.

Careful observation of food names reveals an interesting trend that more and more items are being given descriptive names (e.g., tender grilled chicken) instead of regular names (e.g., grilled chicken) (Wansink et al., 2001; Wansink et al., 2005). This trend is becoming quite popular in the restaurant industry; the “Quesadilla Explosion Salad” offered by Chili’s Grill & Bar (an international casual dining restaurant) and the “Caribbean Passion Smoothie” offered by Jamba Juice (a California-based juice shop featuring smoothies) are two excellent examples. Wansink et al. (2001, 2005) initially attempted to investigate the effect of food names on sales and sensory perceptions. However, their studies were limited to comparisons between descriptive names and regular names. Nowadays, many restaurant practitioners have gone a step further and begun to use another type of food names, ambiguous food name, which is more abstract and atypical than both descriptive names and regular names. Some industry examples can be identified: “Wonton Chicken Happiness” (a Chinese chicken salad offered by Souplantation, a U.S. buffet-style restaurant) and “Joan’s Broccoli Madness” (a broccoli salad offered by Sweet Tomatoes, a U.S. restaurant featuring fresh ingredients). Similarly, a popular Chinese dish of clear noodles with ground pork is called “Ants Climbing a Tree” on many Sichuan restaurants’ menu.

Few scholars have investigated this new trend and it is not clear whether such ambiguous food names are more appealing to customers than regular names. To bridge this gap, we employ Miller and Kahn’s (2005) typology and focus on two categories of food names: common descriptive names and ambiguous names. A common descriptive name is a typical and specific (e.g., Chocolate Cake) whereas an ambiguous name is atypical and unspecific (e.g., Midnight Madness Cake). Moreover, as suggested by extant studies on verbal information, different product names may trigger different levels of imagination (Lutz and Lutz, 1977). In most cases, ambiguous names stimulate the imagination more than common descriptive names. When accompanied by pictures, different product names trigger different processes of verbal and visual information integration that interfere with the effect of images (Lutz and Lutz, 1977; Miller and Kahn, 2005; Wyer et al., 2008). Therefore, we argue that the effect of adding pictures to menus may vary depending on the types of food names

(common descriptive vs. ambiguous).

According to Wyer et al. (2008), the mixed result of adding pictures to verbal information could also be due to differences in individuals' information processing styles, which chronically influence the integration of visual and verbal information. Hence, we also consider the individual trait of information processing style in the current study. When presented with the same combination of pictures and food names on menus, different consumers may employ different strategies to process the information. According to Childers et al. (1985), individuals can be classified into two groups: visualizers and verbalizers. Visualizers tend to form mental images when processing either verbal or visual information and construct integrated visual representations of objects based on these images. In contrast, verbalizers tend to code information verbally without constructing mental images. The major difference between visualizers and verbalizers is whether they construct mental images when processing verbal information or not (Wyer et al., 2008). Consequently, the effect of adding menu pictures may also vary between visualizers and verbalizers.

In two experimental studies, we examine the joint effects of pictures, food names, and individuals' information processing styles on consumers' attitudes, purchase intentions, and willingness to pay for menu items.

CONCEPTUAL BACKGROUND

Effect of Pictures

Since the use of images in marketing messages is quite common, significant attention has been paid to visual information processing in consumer behavior research. The first wave of studies revealed that the impact of adding pictures to verbal messages is mainly positive (e.g., Childers and Houston, 1984; Kisielius and Sternthal, 1984; Mitchell and Olson, 1981; Shepard, 1967; Starch, 1966). For example, adding pictures can increase the memorability of brand names and product information (e.g.: Kisielius and Sternthal, 1984; Starch, 1966; Shepard, 1967). Extant studies also suggest that pictures can improve consumers' attitudes and increase their purchase intentions. For example, Mitchell and Olson (1981) suggest that advertisements with pictures induce more favorable brand attitudes than those without pictures. More recently, Pennings et al. (2013) found that adding pictures to educational nutrition pamphlets can increase the length of time a consumer gazes at nutrition labels and consequently lead to a higher likelihood of making healthy food choices.

However, studies also have revealed situations in which presenting pictures with verbal information is rather ineffective (Adaval and Wyer, 1998; Miller and Kahn, 2005; Taylor and Thompson, 1982; Wyer and Hong, 2010; Wyer et al., 2008). For example, Unnava and Burnkrant (1991) showed that when verbal information is highly imagery-provoking, adding a product picture does not increase recall. Similarly, Adaval and Wyer (1998) found that when vacation information is described using an unordered list, the addition of pictures actually interferes with individuals' evaluations.

These studies indicate that researchers have not reached consensus on the

effect of adding product pictures to verbal information (see Table 1 for a summary of extant literature on the effects of pictures). In the current study, we argue that product names and individuals' information processing styles moderate the effect of pictures in the restaurant industry.

Common Descriptive Names and Positive Picture Effect

When comprehending verbal information such as dish names, people tend to construct mental images (Wyer et al., 2008), or try to visualize the dish based on its name (Rane, 2009). The probability of a consumer constructing mental images when reading words (e.g., a food name) is called imagery value. Different product names have different imagery values and can stimulate the imagination to a different degree (Lutz and Lutz, 1977). In most cases, ambiguous names stimulate the imagination more than common descriptive names. For instance, when reading the common descriptive name (e.g.: Peach Tart with Almond Crust), consumers can easily picture the dish in their minds since the name is straightforward. When reading the ambiguous name for the same classical peach tart (e.g.: Sunset Beach), however, consumers may find it more difficult to form mental pictures because the ambiguous name may cause them to imagine various images of the dessert.

Several studies reveal that the ability to integrate pictures and verbal information determines the effectiveness of images (Edell and Staelin, 1983; Lutz and Lutz, 1977; Unnava and Burnkrant, 1991; Van Rompay et al., 2010; Wyer et al., 2008). For example, Van Rompay et al. (2010) manipulated the pictures provided on hotel booking websites as either easy-to-integrate or difficult-to-integrate, and their results demonstrate that the fluent integration of pictures and verbal information determines the positive effect of adding a picture to the verbal information. Moreover, Edell and Staelin (1983) demonstrated that providing images associated with verbal information can lead to better brand recall than the ones dissociated from verbal information. As suggested by Wyer et al. (2008), when a mental image based on verbal information is congruent with a provided picture, adding the picture will have a positive impact on consumers' product evaluations. However, if the mental image based on verbal information is incongruent with the provided picture, the presence of that picture may decrease consumers' evaluations. Unnava and Burnkrant (1991) also suggested that pictures have a positive effect only when verbal information triggers a lower level of imagination. In other words, when people put less effort to elicit a visual image when processing the verbal information, adding pictures will result in a positive effect.

Since common descriptive names are typical and straightforward, we argue that they are less likely to trigger a high level of imagination. Consumers can easily visualize a food item using the food name as a framework to encode the visual information. The mental images they construct when they read common descriptive food names should be congruent with the pictures on the menu (Edell and Staelin, 1983). When consumers are able to integrate verbal and visual information into one modality, they are likely to express the positive attitudes towards the products (e.g., Heckler and Childers, 1992). We argue that presenting pictures leads to favorable consumers' attitudes and behavioral outcomes in the common descriptive names

condition. Thus, we hypothesize:

Hypothesis 1: The presence of pictures on food items with common descriptive names will have a positive effect on consumers' attitudes and behavioral outcomes.

Ambiguous Names and Image Conflict

Unlike common descriptive names, ambiguous names in the restaurant industry tend to be vague and difficult to comprehend. Consequently, consumers tend to imagine what the food would look like (Miller and Kahn, 2005). When individuals are specifically trying to comprehend verbal information about a product (e.g., a food name) in order to make a decision or a judgment, they attempt to first mentally picture the product based on its name, and then tentatively integrate the constructed mental image with the provided visual information (Wyer et al., 2008). However, when a coherent image is difficult to construct based on the provided visual and verbal information, consumers tend to evaluate the product unfavorably. For example, Petrova and Cialdini (2005) revealed that advertisement effectiveness ratings decrease when consumers find it difficult to integrate the mental image evoked by verbal information with the picture in an advertisement. In other words, although the ability to stimulate consumers' imaginations with ambiguous names is often desirable, adding pictures to such ambiguous names could result in negative outcomes (Lutz and Lutz, 1977; Unnava and Burnkrant, 1991). Miller and Kahn (2005) indeed demonstrated that adding pictures to product descriptions decreases consumers' evaluations of products with ambiguous names.

In the foodservice context, an ambiguous name such as "Sunset Beach" may generate various mental images in a consumer's mind that can vary greatly from the picture shown next to the food name. In that case, the verbal information and the visual information on the menu tend to be incongruent and the conflict between the mental image and the provided picture may obstruct the consumer's ability to integrate information. Indeed

Therefore, when a mental image based on verbal information about a product (e.g., an ambiguous food name) cannot be fluently integrated with the presented picture, the picture becomes a latent source of distraction, and consumers evaluate the product less favorably (Edell and Staelin, 1983; Wyer et al., 2008). However, in the current study we further argue that an individual's information processing style can moderate such an effect.

Information Processing Style

Extant research suggests that individuals tend to adopt either a visual or a verbal information processing style (i.e., visualizers or verbalizers), which can in turn influence their behaviors and judgments (Wyer et al., 2008). The adoption of visual or verbal processing strategies can be driven by individuals' chronic dispositions as well as situational factors, but the influence of these information processing styles on consumers' judgments and behaviors are virtually identical (Jiang et al., 2007).

For visualizers, the chronic disposition to transform verbal information into

visual formats reflects a spontaneous process of mental image construction (Bransford and Johnson, 1973; Garnham, 1981; Glenberg et al., 1987; Wyer and Xu, 2010). This verbal to visual transformation forms a single modality that helps visualizers make judgments. Verbally coded information is recoded into a visual format, and the newly generated mental image is integrated with the presented picture (Wyer et al., 2008).

When visualizers read a food name, they tend to construct mental images and try to visualize the food based on its name, and such mentally-constructed images can vary from the presented picture (Rane, 2009). In the “Sunset Beach” example, visualizers tend to generate pictures of different types of desserts in their minds based on the name, such as a vanilla soufflé, a peach cake, or a fruit tart based on the ambiguous food name, and then they may find it difficult to integrate the mental picture with the picture presented on the menu. More importantly, when the picture and the image generated from verbal information are difficult to integrate, visualizers evaluate the item less favorably (Jiang et al., 2007). Therefore, when encountering an ambiguous food name along with a picture, visualizers tend to find it difficult to integrate the provided picture with the mental image generated from the food name. Such difficulty in turn will trigger unfavorable attitudes and behavioral outcomes (Petrova and Cialdini, 2005). Therefore, we hypothesize:

Hypothesis 2: For visualizers, the presence of pictures on food items with ambiguous names will have a negative effect on consumers’ attitudes and behavioral outcomes.

Unlike visualizers, verbalizers do not tend to construct mental images when processing verbal information (Wyer et al., 2008). Hence, when encountering an ambiguously food name with a picture, verbalizers are not expected to experience difficulties constructing a consistent mental image. In this regard, the presence of a picture can act as additional information that helps verbalizers comprehend product information. We thus propose the following:

Hypothesis 3: For verbalizers, the presence of pictures on food items with ambiguous names will have a positive effect on consumers’ attitudes and behavioral outcomes.

STUDY 1

Pilot Study

The primary purpose of the pilot study was to check the efficacy of the two types of food names. We chose chocolate ice cream as a target food item and presented it on menus with two different names: *Chocolate Ice Cream*, representing a common descriptive name, and *Waltz on the Ice*, representing an ambiguous name. We selected these two food names based on current market offerings and advice from a marketing professor.

We recruited 47 students from a large state university in the Southeastern United States. All participants were told that the researchers were helping a restaurant promote a new dessert, and they were randomly assigned to either the common descriptive name condition (*Chocolate Ice Cream*, $N = 23$) or the ambiguous name

condition (Waltz on the Ice, $N = 24$). Respondents were first instructed to read the dessert name along with a short description (which was the same for both conditions), and then they were asked to respond to three items using 7-point Likert scales (1 = strongly disagree to 7 = strongly agree) measuring their perceptions of the dish name adapted from Miller and Kahn's (2005) study (i.e., "The dish name is a typical dessert name;" "This dish name is specific to this type of dessert;" and "When reading this dish name, I find it straightforward to understand;" Cronbach's $\alpha = .84$). Then, we verified the study results following Wyer et al. (2008) by instructing all participants to mentally picture the dessert based on its name before showing them a picture of chocolate ice cream (see the Appendix). After reviewing the picture, they were asked to answer two items using 7-point Likert scales (1 = strongly disagree to 7 = strongly agree) that capture the difficulty of integrating verbal and visual information (i.e., "I find that my mental image of the dessert and the real dessert picture are similar;" and "It's easy for me to integrate my mental image of the dessert and the real dessert picture.").

We compared the two food names using two independent sample t -tests. As expected, respondents reported that the name "Chocolate Ice Cream" was more typical and straightforward ($M = 5.17$) than the name "Waltz on the Ice" ($M = 2.69$, $p < .001$). In addition, after viewing the ice cream picture, respondents indicated that it was easier to integrate the information in the common descriptive name condition ($M = 4.19$) than in the ambiguous name condition ($M = 3.33$, $p = .04$). These results suggest that our dish name manipulation was effective.

Study Design

We used a 2 (picture: presence vs. absence) \times 2 (food name type: common descriptive vs. ambiguous) between-subjects design to test the hypotheses. To measure information processing style, we used the established scale from Childers et al.'s (1985) study. We used "Chocolate Ice Cream" and "Waltz on the Ice" to represent a common descriptive food name and an ambiguous food name, respectively, and manipulated picture presence by presenting the two different types of names with and without a picture (see Appendix A for sample menus and the number of participants in each condition).

Participants and Procedure

We recruited 263 adult participants from the United States using Amazon Mechanical Turk, an online commercial panel. We offered 50 cents to those who volunteered to complete the survey. After excluding two outliers from the analysis,¹ our final sample included 261 respondents (63.2% males, mean age of 28, 88.9% with some college or more, 77% Caucasian, and 61.3% with annual household income

¹ We treated two observations as outliers because of their extreme values. Two participants were willing to pay \$0 and \$15, respectively, for the dessert; yet the average amount other participants were willing to pay for the dessert was \$4.54 ($SD = \1.59, $Min = 1$, $Max = 10$). Because such observations may have an unexpected impact on the coefficient estimate, excluding them avoids potentially misleading results. Note that the results show a similar pattern when the two outliers are included in the analysis.

between \$20,000 and \$80,000). The demographic characteristics of the sample are shown in Table 2.

All participants were randomly assigned to one of the four menu conditions. The participants were first asked to imagine that they were holding a menu and ordering a dessert. Then, they were asked to indicate how much they would be willing to pay for the dessert shown on the menu. Both marketing managers and researchers agree on the crucial role of consumers' willingness to pay in pricing decisions and product development (Ajzen and Driver, 1992; Breidert et al., 2006; Voelckner, 2006; Wertenbrock and Skier, 2002). In hospitality research, willingness to pay is also regarded as an important measurement of consumers' decisions and evaluations (Janssen and Hamm, 2012).

Measurements

We measured participants' information processing style using Childers et al.'s (1985) established style-of-processing (SOP) scale to assess their propensity to process information visually vs. verbally. The scale consists of 22 items: 11 items comprise the visualizer subscale (1 = always false, 4 = always true; Cronbach's $\alpha = .77$) (e.g., "I find it helps to think in terms of mental pictures when doing many things"), and 11 items comprise the verbalizer subscale (1 = always false, 4 = always true; Cronbach's $\alpha = .81$) (e.g., "I enjoy doing work that requires the use of words"). Based on participants' responses to the established style-of-processing scale, we categorized respondents as visualizers or verbalizers. Following Childers et al.'s (1985) recommendation, we determined each subject's processing style by subtracting the visualizer subscale score from the verbalizer subscale score. Participants with higher difference scores possessed a stronger disposition to process information visually, whereas those with lower difference scores possessed a stronger disposition to code information verbally (Childers et al., 1985).

Willingness to pay reflects the amount that individuals would pay for a product (Voelckner, 2006). We measured this variable using a single question adapted from Wertenbrock and Skier's study (2002) (i.e., "If you are going to order the dessert shown on the above menu in a casual dining restaurant, how much would you like to pay?"). We captured demographic information such as gender, age, education level, household income and ethnic background at the end of the questionnaire.

Hypothesis Testing

We used a moderated regression analysis to test Hypotheses 1, 2 and 3 with participants' willingness to pay for the dessert as the dependent variable (Aiken and West, 1991; West et al., 1996). We dummy coded picture as picture absence = 0 and picture presence = 1. We also dummy coded food name as ambiguous name = 0 and common descriptive name = 1. We regressed data for picture, food name, mean-centered information processing difference score, and all two- and three-way interactions between/among these variables on consumers' willingness to pay. The results reveal a significant main effect of food name ($M_{\text{ambiguous}} = 4.94$,

$M_{\text{common descriptive}} = 4.15$, $B = -1.423$, $t = -5.954$, $p < .001$), a significant two-way interaction of picture and food name ($B = 1.564$, $t = 4.509$, $p < .001$), and a significant three-way interaction of picture, food name, and information processing difference score ($B = 2.769$, $t = 4.995$, $p < .001$).

To test H1, we implemented a planned contrast within the condition of common descriptive name. The results indicate that for the dessert with a common descriptive name, consumers are willing to pay significantly more when a picture is included ($M = 4.66$) than when a picture is not included ($M = 3.72$, $B = .938$, $t = 3.612$, $p < .001$). Thus, Hypothesis 1 is supported.

To test H2 and H3, we employed a spotlight analysis to examine the effect of a picture and an ambiguous food name on consumers' willingness to pay at one standard deviation above and below the mean information processing difference score (Aiken and West, 1991; Fitzsimmons, 2008; Yang and Mattila, 2013). Compared with dichotomization (i.e., median splitting using ANOVA), spotlight analysis is considered as a more appropriate statistical approach to test the effect of a continuous independent variable. Spotlight analysis can avoid major problems associated with dichotomizing continuous variables such as reduced statistical power and spurious significant results (Fitzsimmons, 2008; Spiller et al., 2013).

Within the condition of ambiguous name, a spotlight analysis ($N = 261$) at one standard deviation above the mean information processing difference score suggests that the effect of a picture is negative and significant ($B = -2.001$, $t = -5.855$, $p < .001$), indicating that consumers with high information processing difference scores (visualizers) tend to be willing to pay significantly less for an ambiguously-named dessert with a picture ($M = 3.99$) than one without a picture ($M = 5.99$). Thus, H2 is supported. Consistent with H3, another spotlight analysis at one standard deviation below the mean information processing difference score suggests that the effect of a picture is positive and significant ($B = .869$, $t = 2.605$, $p = .0097$), indicating that consumers with low information processing difference scores (verbalizers) demonstrate higher willingness to pay for an ambiguously-named dessert with a picture ($M = 5.17$) than one without a picture ($M = 4.30$). This interaction is visualized in Figure 1.

STUDY 2

Although willingness to pay is regarded as an important measurement of consumers' decisions and menu evaluations, relying solely on that construct has some drawbacks. First, outlier data (such as \$0 and \$15 in Study 1) could possibly bias the study result. Second, willingness to pay can be influenced by restaurant type (e.g., casual dining vs. fine dining). In order to overcome the potential drawbacks in Study 1, we measured consumers' general attitudes after revealing the price and assessing their purchase intentions in Study 2. Moreover, to demonstrate the general applicability of the findings, we used a different food type (i.e., a lunch item).

Pilot Study

We recruited 100 participants (54% males; 46% between the ages of 26 and 35; 49% with a Bachelor's degree or higher; 74% Caucasian; 62% with annual household income between \$20,000 and \$79,999) from the United States using Amazon Mechanical Turk to check the efficacy of two types of food names: *Chicken and Egg Salad* (common descriptive name) and *Which Came First* (ambiguous name). The two names were selected after consulting with two restaurant chefs and a marketing professor. Participants were randomly assigned to either the common descriptive name condition (Chicken and Egg Salad, $N = 50$) or the ambiguous name condition (Which Came First, $N = 50$). Both the study design and procedure were identical to the pilot study of Study 1. Results reveal that "Chicken and Egg Salad" was regarded as more typical, specific and straightforward ($M = 5.29$) than "Which Came First" ($M = 3.27$, $p < .001$). After viewing a picture of the dish, participants found it easier to integrate the information in the common descriptive name condition ($M = 5.27$) than in the ambiguous name condition ($M = 4.06$, $p < .001$). As expected, results show that the food name manipulation was effective.

Participants and Study Design

As in Study 1, we employed a 2 (picture: presence vs. absence) \times 2 (food name type: common descriptive vs. ambiguous) between-subjects design. We assessed information processing style using Childers et al.'s (1985) scale and used "Chicken and Egg Salad" and "Which Came First" to represent common descriptive and ambiguous food names, respectively. The 360 respondents (60.6% males; mean age of 33 years; 55% with a Bachelor's degree or higher; 77.5 % Caucasian; 63.6% with an annual household income between \$20,000 and \$79,999) were randomly assigned to one of the four menu conditions (see Appendix B for sample menus and the number of participants in each condition). The study procedure was identical to Study 1.

Measurements

The main objective of Study 2 was to use another outcome variable to test the hypotheses. Hence, we measured participants' general attitudes prior to revealing the price and assessing their purchase intentions. Specifically, participants were asked to anchor their attitudes on two 7-point Likert-type scales (1 = unfavorable, 7 = favorable; and 1 = negative, 7 = positive; $\alpha = .95$). Next, we revealed the price of the dish (i.e., \$7.99) and asked participants to indicate their level of agreement with the following statement on a 7-point Likert-type scale: "I'm interested in ordering this dish" (1 = strongly disagree, 7 = strongly agree). Then, we measured information processing style using Childers et al.'s (1985) style-of-processing (SOP) scale. Finally, we asked participants to provide demographic information such as gender, age, education level, household income and ethnic background.

Hypothesis Testing

Attitude. To test our hypotheses regarding the impact of information processing style on the relationship between food name and picture on attitude, we

regressed attitude on food name (0 = ambiguous name; 1 = common descriptive name), picture (0 = picture absence; 1 = picture presence), mean-centered information processing difference score, and all two- and three-way interactions between/among these variables. This regression model reveals a significant effect of food name ($M_{\text{ambiguous}} = 4.44$, $M_{\text{common descriptive}} = 3.88$, $B = -1.240$, $t = -5.562$, $p < .001$), a significant two-way interaction of picture and food name ($B = 1.275$, $t = 4.001$, $p < .001$), and a significant three-way interaction of picture, food name, and ($B = 1.512$, $t = 3.213$, $p = .0014$). To test H1, we implemented a planned contrast in the common descriptive name condition. Participants' attitudes were more positive when a picture of the dish was included on the menu ($M_{\text{picture present}} = 4.33$, $M_{\text{picture absent}} = 3.43$; $B = .898$, $t = 3.963$, $p < .001$). Hence, H1 is supported. In the ambiguous name condition, results of a spotlight analysis at one standard deviation above the mean information processing difference score (i.e., visualizer) reveals a significant difference between picture presence and picture absence ($B = -1.471$, $t = -4.825$, $p < .001$), indicating that visualizers hold less positive attitudes towards an ambiguously-named dish with a picture ($M = 3.86$) than one without a picture ($M = 5.33$). As expected, H2 is supported. To confirm H3, we performed another spotlight analysis at one standard deviation below the mean information processing difference score (i.e., verbalizers). Results suggest that the effect of a picture is positive and significant ($B = .687$, $t = 1.916$, $p = .056$), indicating that verbalizers exhibit more positive attitudes towards an ambiguously-named dish with a picture ($M = 4.74$) than one without a picture ($M = 4.05$) (see Figure 2).

Purchase Intentions. We then tested our hypotheses by assessing purchase intentions as the outcome variable after revealing the price to participants. In line with the attitude analyses described above, we performed the same regression analyses with purchase intentions as the dependent variable. The results show a significant effect of food name ($M_{\text{ambiguous}} = 3.16$, $M_{\text{common descriptive}} = 3.82$, $B = -1.327$, $t = -5.341$, $p < .001$), a significant two-way interaction of picture and food name ($B = 1.143$, $t = 3.218$, $p = .0014$), and a significant three-way interaction of picture, food name, and the individual's information processing difference score ($B = 1.989$, $t = 3.792$, $p = .0002$). As predicted, in the common descriptive name condition, purchase intentions are higher when a picture is present ($M_{\text{picture present}} = 3.52$, $M_{\text{picture absent}} = 2.80$; $B = 1.400$, $t = 3.850$, $p < .001$). In the ambiguous name condition, visualizers (1 SD above the mean information processing difference score) demonstrate lower purchase intentions towards a food with a picture ($M = 2.83$) than one without a picture ($M = 4.78$; $B = -1.953$, $t = -5.752$, $p < .001$). However, verbalizers (1 SD below the mean information processing difference score) exhibit higher purchase intentions toward an ambiguously-named food with a picture ($M = 4.60$) than one without a picture ($M = 3.54$; $B = 1.054$, $t = 2.637$, $p = .009$) (see Figure 3).

DISCUSSION

In the restaurant industry, food names and menu pictures are the most basic and essential information presented to consumers. Although practitioners have proficiently utilized different types of names and gradually increased their attempts to use ambiguous names, scholars have offered little evidence about the effectiveness of using different food names and presenting food pictures on menus. To address this gap in the research, we have investigated the joint effect of food name and picture presence on consumers' attitudes and behavioral outcomes (purchase intentions and willingness to pay). To the best of our knowledge, we are the first to contrast common descriptive food names and ambiguous food names while investigating consumers' reactions to different food name-food picture combinations.

Although adding pictures requires using a large portion of precious menu space and substantially increases printing costs, many restaurants include pictures with verbal descriptions of items on restaurant menus. However, extant research on picture effectiveness has generated mixed results. Results of some studies show that adding pictures to verbal information could result in positive outcomes such as higher and more accurate brand/product recall, more favorable attitudes toward products, and stronger purchase intentions (Kisielius and Sternthal 1984; Mitchell and Olson, 1981; Pennings et al., 2013; Shepard, 1967; Starch, 1966). However, results of other studies demonstrate that the presence of pictures in addition to verbal information may not always be beneficial, and sometimes can even be detrimental (Adaval, et al. 2007; Adaval and Wyer, 1998; Edell and Staelin, 1983; Wyer et al., 2008; Unnava and Burnkrant, 1991).

Common descriptive names are straightforward labels that generally induce lower levels of imagination (Lutz and Lutz, 1977; Miller and Kahn, 2005; Wyer et al., 2008). Consumers can easily visualize a food item with a common descriptive name, and the visualized image can be smoothly integrated with the provided food picture. Therefore, adding a picture next to a common descriptive food name can lead to positive outcomes. Our study results confirm that consumers exhibit more favorable attitudes and behavioral outcomes when provided with common descriptive food names with pictures than the ones without pictures.

Unlike common descriptive names, ambiguous names are vague and tend to induce higher levels of imagination. Since the mental images people form based on an ambiguous name can vary greatly from the presented food picture, consumers may have a difficult time integrating the verbal and visual information. In other words, presenting pictures next to ambiguous food names may hinder consumers' ability to integrate the menu information and result in negative outcomes.

However, our results show that individuals' information processing styles (verbalizers vs. visualizers; Childers et al., 1985) moderate such an effect. For verbalizers, who tend to directly process verbal information without forming any mental images, adding pictures to ambiguous food names can increase consumers' attitudes and behavioral intentions. However, for visualizers, who tend to construct mental images when processing verbal information, the aforementioned difficulty

associated with integrating pictures of food items with their mental images based on ambiguous food names becomes salient. Consequently, visualizers exhibit less favorable attitudes, less likelihood to purchase, and lower willingness to pay for ambiguously-named food items presented with pictures (vs. without pictures).

Managerial Implications

In addition to the aforementioned theoretical contributions, the current study has important implications for hospitality practitioners. Our results indicate that in general, consumers are willing to pay more for food items with ambiguous names than for items with common descriptive names. Therefore, restaurant managers may consider using ambiguous names for their dishes in order to increase revenue. However, not all dishes warrant ambiguous names, and most dishes are still given typical names in most restaurants. When an ambiguous name is not an option, results of our study suggest that presenting pictures next to items with common descriptive names will increase consumers' attitudes, purchase intentions, and willingness to pay for those items. Therefore, restaurant managers may also consider naming their low profit margin items with common descriptive names but presenting attractive food pictures to increase sales and profits.

More interestingly, although presenting vivid pictures on menus is a common practice in the restaurant industry, the current study suggests that adding pictures may not always increase the evaluations of menu items and sometimes may even be detrimental. Presenting food pictures can in fact decrease evaluations of food items with ambiguous names among visualizers. Therefore, restaurant managers should effectively design their menus and adjust visual information based on food names and consumers' information processing styles.

Although information processing style is an individual trait, it varies at the group level based on factors such as occupation (Kozhevnikov, 2007) and culture (Anderson, 1988; Tavassoli and Lee, 2003; Wyer and Hong, 2010). One processing style could be salient at a given restaurant. For instance, professionals in a specific field could develop a collectively dominant information processing style. Visual artists tend to process information visually, while linguists have a general disposition to process information verbally (Kozhevnikov, 2007). Furthermore, according to Wyer and Hong (2010), Chinese consumers are more likely than Westerners to possess a visualizer processing style. Therefore, restaurant practitioners may use easy-to-capture information to infer their target consumers' information processing styles and design their menus accordingly. For example, local restaurants in SoHo or West Chelsea in New York City may attract many artists and art fans. Restaurant managers in similar locations may consider using ambiguous names for dishes and providing no pictures on their menus. Such a practice will not only help reduce menu printing costs, but also increase consumers' evaluations.

Limitations and Future Research

Several limitations in this study need to be recognized. First, respondents in this research were asked to imagine ordering a dish in a casual dining restaurant. We

captured consumers' willingness to pay as intentions, rather than actual behaviors. In the future, researchers could conduct a field study to capture real purchasing behavior, and test whether the results are consistent across different types of restaurants. Second, we used the ambiguous names "Waltz on the Ice" and "Which Came First," which have little connection with food. In the future, researchers could explore how consumers react to names with different degrees of ambiguity. It is possible that the effect of ambiguous names may vary depending on the psychological distance between the name and food as a concept.

Third, we did not specify the restaurant type (e.g. quick service, full service, fine dining, etc.) in the current study and our study scenarios were limited to dessert and salad. However, menus pictures may have a different effect on different type of restaurant. For example, pictures are common in quick service and full service restaurants in the U.S. whereas in some east-Asian countries, pictures are essential on luxury restaurant menus. It will be valuable for future scholars to extend the current study to different restaurant settings and different cultures.

Finally, this study verifies the existence of different processing styles proposed in the extant hospitality research, and draws marketers' attention to these types of individual differences when designing marketing strategies. However, since information processing style is an individual trait, it may be difficult for marketers to identify. Yet it is possible to prime the individual differences on information processing style. According to Wyer et al. (2008), visualizers are able to form verbal representations if they are explicitly asked to perform a specific task that requires such a coding style. Likewise, verbalizers can form mental images if they are required to do so. Therefore, researchers could explore approaches that may encourage consumers to process information in the same modality, regardless of their natural dispositions.

REFERENCES

- Aiken, L. S., West, S. G., 1991. Multiple regression: Testing and interpreting interactions. Newbury Park, CA: Sage.
- Ajzen, I., Driver, B. L., 1992. Contingent value measurement: On the nature and meaning of willingness to pay. *Journal of Consumer Psychology* 1(4), 297-316.
- Adaval, R., Wyer, R. S., 1998. The role of narratives in consumer information processing. *Journal of Consumer Psychology* 7(3), 207-245.
- Adaval, R., Isbell, L. M., Wyer, R. S., 2007. The impact of pictures on narrative- and list-based impression formation: A process interference model. *Journal of Experimental Social Psychology* 43(3), 352-364.
- Anderson, J. A., 1988. Cognitive styles and multicultural populations. *Journal of Teacher Education* 39(1), 2-9.
- Bowen, J. T., Morris, A. J., 1995. Menu design: Can menus sell? *International Journal of Contemporary Hospitality Management* 7(4), 4-9.
- Bransford, J. D., Johnson, M. K., 1973. Considerations of some problems of comprehension. In: Chase, W. (Ed.). *Visual information processing*. New York: Academic Press.
- Breidert, C., Hahsler, M., Reuttere, T., 2006. A review of methods for measuring willingness-to-pay. *Innovative Marketing* 2(4), 8-32.
- Childers, T. L., Houston, M. J., 1984. Conditions for a picture-superiority effect on consumer memory. *Journal of Consumer Research* 11, 643-54.
- Childers, T. L., Houston, M. J., Heckler, S. E., 1985. Measurement of individual differences in visual versus verbal information processing. *Journal of Consumer Research* 12, 125-134.
- Edell, J. A., Staelin, R., 1983. The information processing of pictures in print advertisements. *Journal of Consumer Research* 10, 45-61.
- Fitzsimmons, G. J., 2008. Death to dichotomizing. *Journal of Consumer Research* 35(1), 5-8.
- Garnham, A., 1981. Mental models as representations of text. *Memory Cognition* 9(6), 560-565.
- Glenberg, A. M., Meyer, M., Lindem, K., 1987. Mental models contribute to foregrounding during text comprehension. *Journal of Memory and Language* 26(1), 69-83.
- Heckler, S.E. and Childers, T.L., 1992. The role of expectancy and relevancy in memory for verbal and visual information: What is incongruency? *Journal of Consumer Research*, 18(4), pp.475-492.
- Janssen, M., Hamm, U., 2012. Product labelling in the market for organic food: Consumer preferences and willingness-to-pay for different organic certification logos. *Food Quality and Preference* 25(1), 9-22.
- Jiang, Y., Steinhart, Y., Wyer, R. S., 2007. The role of visual and semantic processing strategies in consumer information processing. Unpublished manuscript, Hong Kong University of Science and Technology.
- Kincaid, C. S., Corsun, D. L., 2003. Are consultants blowing smoke? An empirical

- test of the impact of menu layout on item sales. *International Journal of Contemporary Hospitality Management* 15(4), 226 – 231.
- Kisieliuss, J., Sternthal, B., 1984. Detecting and explaining vividness effects in attitudinal judgments. *Journal of Marketing Research*, 21, 54–64.
- Kozhevnikov, M., 2007. Cognitive styles in the context of modern psychology: Toward an integrated framework of cognitive style. *Psychological Bulletin* 133(3), 464-481.
- Kreul, L. M., 1982. Magic numbers: psychological aspects of menu pricing. *Cornell Hotel and Restaurant Administration Quarterly* 23(2), 70-75.
- Lutz, K. A., Lutz, R. J., 1977. Effects of interactive imagery on learning: Applications to advertising. *Journal of Applied Psychology* 62(4), 493-498.
- Miller, E. G., Kahn, B. E., 2005. Shades of meaning: The effect of color and flavor names on consumer choice. *Journal of Consumer Research* 32(1), 86-92.
- Miner, T., 1996. Customer-focused menu marketing. *Cornell Hotel and Restaurant Administration Quarterly* 37(3), 36–41.
- Miniard, P. W., Bhatla, S., Lord, K. R., Dickson, P. R., Unnava, H. R., 1991. Picture-based persuasion processes and the moderating role of involvement. *Journal of Consumer Research* 18(1), 92-107.
- Mitchell, A. A., Olson, J. C., 1981. Are product attribute beliefs the only mediator of advertising effects on brand attitudes? *Journal of Marketing Research* 18, 318-332.
- Naipaul, S., Parsa, H. G., 2001. Menu price endings that communicate value and quality. *Cornell Hotel and Restaurant Administration Quarterly* 42(1), 26-37.
- Pavesic, D., 2005. The psychology of menu design: reinvent your silent salesperson to increase check averages and guest loyalty. Hospitality Faculty Publications, Paper 5. Retrieved from http://digitalarchive.gsu.edu/hospitality_facpub/5.
- Pennings, M. C., Striano, T., Oliverio, S., 2013. A picture tells a thousand words Impact of an educational nutrition booklet on nutrition label gazing. *Marketing Letters* 25(4), 355-360.
- Petrova, P. K., Cialdini, R. B., 2005. Fluency of consumption imagery and the backfire effects of imagery appeals. *Journal of Consumer Research* 32(3), 442–452.
- Rane, M. S., 2009. Visual appetite. *Design Thoughts* January, 11-19. Retrieved from <http://www.idc.iitb.ac.in/resources/dt-jan-2009/Visual%20Appetite.pdf>
- Reynolds, D., Merritt, E. A., Pinckney, S., 2005. Understanding menu psychology: An empirical investigation of menu design and consumer response. *International Journal of Hospitality Tourism Administration* 6(1), 1-10.
- Shepard, R. N., 1967. Recognition memory for words, sentences and pictures. *Journal of Verbal Learning and Verbal Behavior* 6(1), 156-163.
- Spiller, S. A., Fitzsimons, G. J., Lynch Jr, J. G., McClelland, G. H., 2013. Spotlights, floodlights, and the magic number zero: Simple effects tests in moderated regression. *Journal of Marketing Research* 50(2), 277-288.
- Tavassoli, N. T., Lee, Y. H., 2003. The differential interaction of auditory and visual advertising elements with Chinese and English. *Journal of Marketing Research*

- 40(4), 468–480.
- Taylor, S. E., Thompson, S. C., 1982. Stalking the elusive “vividness” effect. *Psychological Review* 89(2), 155-181.
- Unnava, H. R., Burnkrant, R. E., 1991. An imagery-processing view of the role of pictures in print advertisements. *Journal of Marketing Research* 28, 226–231.
- Van Rompay, T. J. L., De Vries, P. W., Van Venrooij, X. G., 2010. More than words: On the importance of picture-text congruence in the online environment. *Journal of Interactive Marketing* 24(1), 22-30.
- Viswanathan, M., Childers, T. L., 2003. An enquiry into the process of categorization of pictures and words. *Perceptual and motor skills* 96(1), 267-287.
- Voelckner, F., 2006. An empirical comparison of methods for measuring consumers' willingness to pay. *Marketing Letters* 17(2), 137–149.
- Wansink, B., Painter, J., Van Ittersum, K., 2001. Descriptive menu labels' effect on sales. *The Cornell Hotel and Restaurant Administration Quarterly* 42(6), 68-72.
- Wansink, B., Van Ittersum, K., Painter, J. E., 2005. How descriptive food names bias sensory perceptions in restaurants. *Food Quality and Preference* 16(5), 393-400.
- Wertenbroch, K. Skiera, B., 2002. Measuring consumers' willingness to pay at the point of purchase. *Journal of Marketing Research* 39(2), 228-241.
- Wyer, R. S., Hong, J., 2010. Chinese Consumer Behavior: The Effects of Content, Process and Language, In: Bond, M. H. (Ed.). *Oxford handbook of Chinese Psychology*, 2nd edition. New York: Oxford University Press, pp. 633-635.
- Wyer, R. S., Hung, I. W., Jiang, Y., 2008. Visual and verbal processing strategies in comprehension and judgment. *Journal of Consumer Psychology* 18(4), 244–257.
- Wyer, R. S., Xu, A. J., 2010. The role of behavioral mind-sets in goal-directed activity: Conceptual underpinnings and empirical evidence. *Journal of Consumer Psychology* 20(2), 107-125.
- Yang, S. S., Kimes, S. E., Sessarego, M. M., 2009. Menu price presentation influences on consumer purchase behavior in restaurants. *International Journal of Hospitality Management* 28(1), 157-160.
- Yang, W., Mattila, A.S., 2013. The impact of status seeking on consumers' word-of-mouth and product preference - a comparison between luxury hospitality services and luxury goods. *Journal of Hospitality and Tourism Research*. doi: 10.1177/1096348013515920

Table 1
Literature on the Effect of Pictures

Study	Dependent Variables	Study Context	Main Findings	Picture Effect
Childers and Houston (1984)	Memory test	Advertisements	Pictures could benefit recall of the advertisement	Positive Picture Effect
Kisielius and Sternthal (1984)	Memory test	Advertisements	Individuals could recall more brand information and have more favorable attitudes when the advertisements is presented with both pictures and verbal information than the verbal information alone	Positive Picture Effect
Mitchell and Olson (1981)	Consumers' attitudes	Advertisements	Advertisements with pictures induced more favorable attitudes toward a brand than those without pictures	Positive Picture Effect
Pennings, Striano, and Oliverio (2013)	Food choice	Educational nutrition pamphlets	Adding pictures to educational nutrition pamphlets could increase how long a consumer gazes at products' nutrition labels and, consequently, inform healthier food choices	Positive Picture Effect
Shepard (1967)	Memory test	Psychological memory test	Picture group were likely to recognize stimuli the best	Positive Picture Effect
Starch (1966)	Memory test	Brand name	Pictures increased the memorability of brand names and product information	Positive Picture Effect
Viswanathan and Childers (2003)	Categorization	Psychological categorization test	Pictures had an advantage in categorization, and individuals would categorize visual information faster	Positive Picture Effect

Table 1 (continued)

Study	Dependent Variables	Study Context	Main Findings	Picture Effect
Lutz and Lutz (1977)	Memory test	Brand name	When the verbal information was of high imagery, adding pictures would not increase the brand recall	No effect
Miniard, Bhatla, Lord, Dickson, and Unnava (1991)	Consumers' attitudes	Product evaluation	When individuals are motivated to conduct information processing, the addition of pictures would have little additional effect	No effect
Unnava and Burnkrant (1991)	Memory test	Advertisements	When verbal information was at high level of imagery-provoking, adding a picture of a product did not increase recall	No effect
Adaval and Wyer (1998)	Consumers' attitudes	Vacation brochure	When the vacation information was described in an ostensibly unordered list, the addition of pictures would interfere with individuals' evaluations	Negative Picture Effect
Edell and Staelin (1983)	Memory test	Advertisements	When the picture presented in the advertisement was "unframed" (i.e., the verbal information and picture of the brand are not related), the inclusion of the picture could potentially distract consumers, leading to poorer product recall	Negative Picture Effect
Jiang, Steinhart, and Wyer, (2007)	Consumers' attitudes	Hotel advertisement	Individuals decreased the evaluations towards the hotel when the picture and verbal information presented in the hotel advertisement were not consistent	Negative Picture Effect
Miller and Kahn (2005)	Consumers' attitudes	Product evaluation	When the color name was ambiguously named, presence of picture would decrease consumers' attitudes towards the product (i.e., sweater)	Negative Picture Effect

Table 2
Sample Characteristics

Variables	Study 1		Study 2	
	N	Percentage	N	Percentage
Sex				
Male	165	63.2	218	60.6
Female	96	36.8	142	39.4
Highest Education Level				
High school or less	29	11.1	35	9.7
Some college	131	50.2	127	35.3
Bachelor's Degree	84	32.2	152	42.2
Masters/some graduate school	16	6.1	41	11.4
Doctoral and/or Professional Degree	1	0.4	5	1.4
Annual Household Income				
Less than \$20,000	64	24.5	64	17.8
\$20,000 to \$39,999	76	29.1	91	25.3
\$40,000 to \$59,999	55	21.1	89	24.7
\$60,000 to \$79,999	29	11.1	49	13.6
\$80,000 to \$99,999	20	7.7	27	7.5
\$100,000 or more	17	6.5	40	11.1
Ethnicity				
Caucasian - Non-Hispanic	201	77.0	279	77.5
African American	11	4.2	18	5.0
Hispanic	13	5.0	21	5.8
Asian	30	11.5	32	8.9
American Indian, Alaskan, Hawaiian, or Pacific Islander	3	1.1	3	.8
Other	3	1.1	7	1.9

Figure 1. Interaction effect of picture and information processing on consumers' willingness to pay for foods with ambiguous names for Study 1

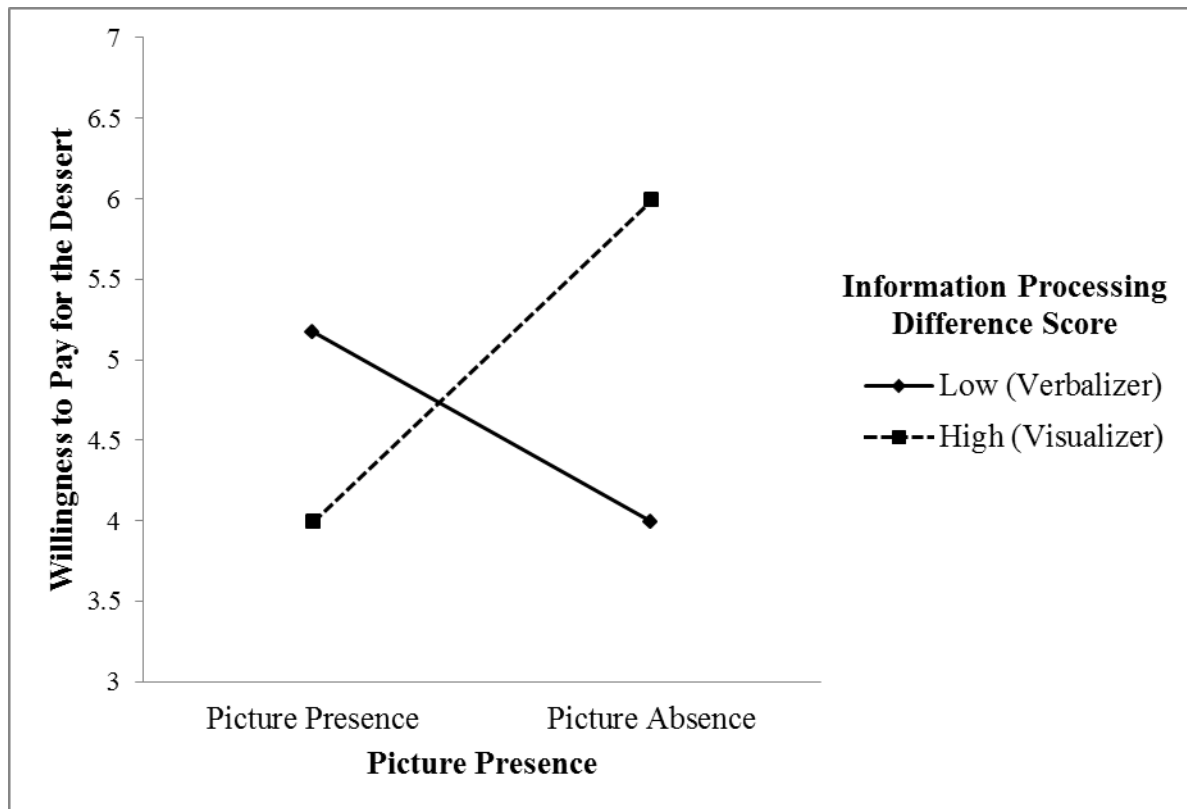


Figure 2. Interaction effect of picture and information processing on consumers' attitudes towards foods with ambiguous names for Study 2

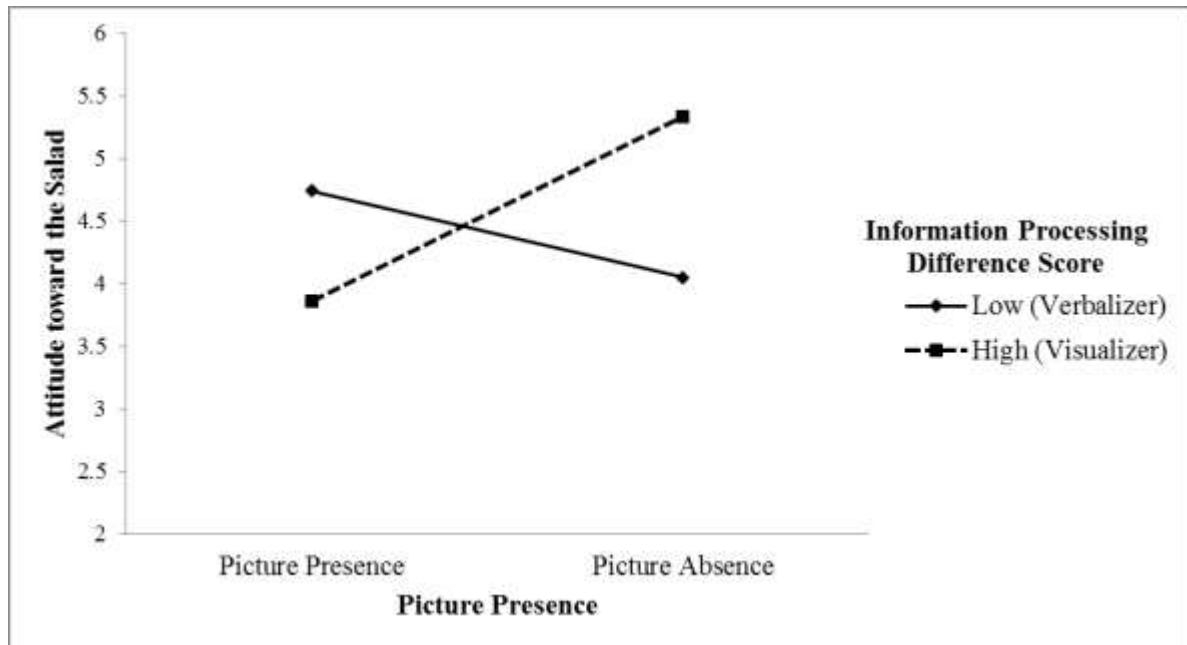
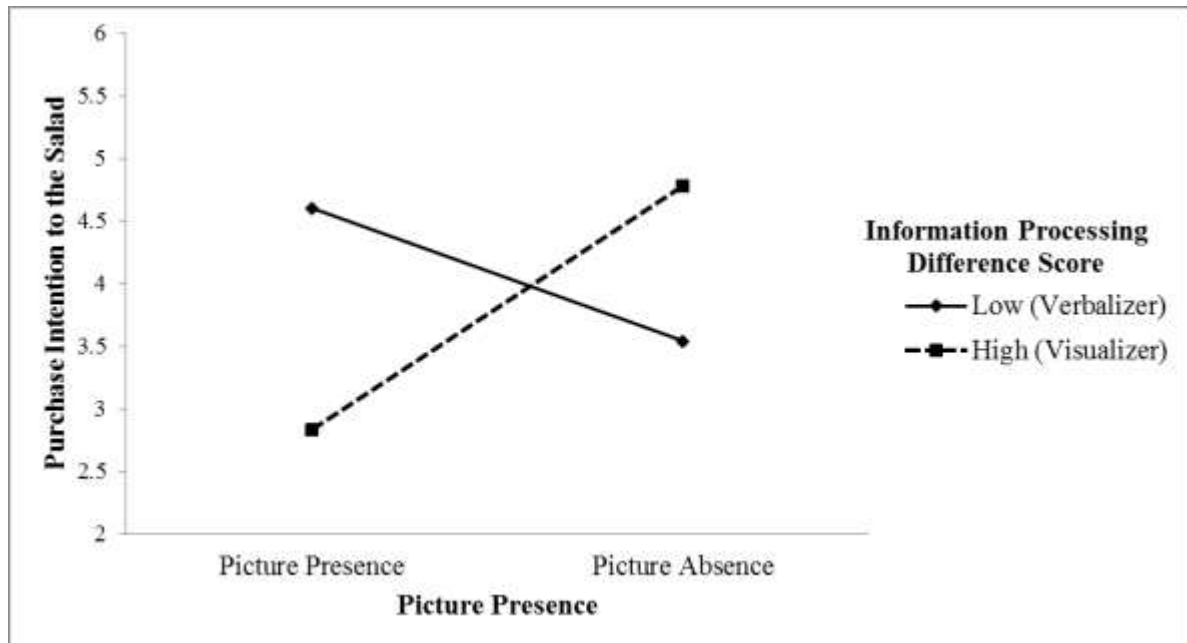


Figure 3. Interaction effect of picture and information processing on consumers' purchase intention towards foods with ambiguous names for Study 2



Appendix A

Sample Menus for Study 1

(A) The Menu of
Common-Descriptive-Named Dessert
with Picture
($N = 62$)



(B) The Menu of
Common-Descriptive-Named Dessert
without Picture
($N = 71$)



(C) The Menu of Ambiguously-Named
Dessert with Picture
($N = 62$)



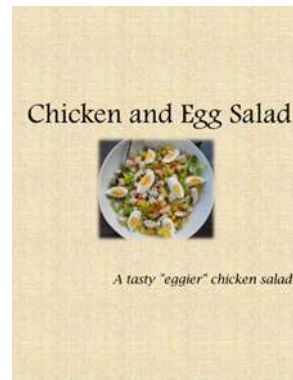
(D) The Menu of Ambiguously-Named
Dessert without Picture
($N = 66$)



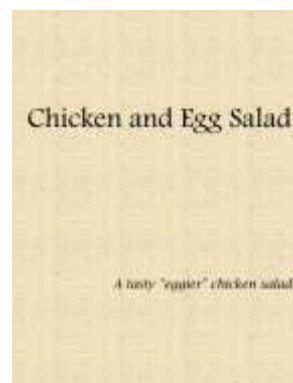
Appendix B

Sample Menus for Study 2

(E) The Menu of
Common-Descriptive-Named Salad with
Picture
($N = 92$)



(F) The Menu of
Common-Descriptive-Named Salad
without Picture
($N = 90$)



(G) The Menu of Ambiguously-Named
Salad with Picture
($N = 88$)



(H) The Menu of Ambiguously-Named
Salad without Picture
($N = 90$)

