

EFFECTS OF MENU CALORIE INFORMATION AND PRODUCT IMAGE ON MILLENNIALS' PURCHASE INTENTION

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Does the presence or absence of an image or calorie information with a food item's description on a menu influence Millennials' purchasing decision? A 2 (image: presence vs. absence of image) x 2 (calories: presence vs. absence of calorie information) x 2 (food item: healthy versus unhealthy) between subjects' design was utilized. Based on work grounded in cohort generation theory, the presence of images is predicted to influence Millennials' intention to purchase restaurant menu food offerings. Findings showed that the presence of images has a negative influence on Millennials' purchase intention, whereas inclusion solely of calories had both a positive and negative effect. The study includes a discussion of the unexpected results and implications for industry and policy for promoting healthful items to Millennials, as well as study limitations and suggestions for future research.

INTRODUCTION

Because calorie labeling is becoming increasingly compulsory in many nations, some restaurants have started reacting to calorie labeling by increasing their offerings of lower-calorie items (Bleich et al. 2015). Thus, the effects of mandatory menu labeling are the creating introduction of healthier menu options (King and Shu 2016), irrespective of kind of venue (e.g., fine dining, traditional, fast food). Given this emerging milieu of government-enjoined caloric information in menus, restaurateurs must find ways to attract consumers to purchase healthier food items in the presence of calorie labels.

With the augmented trend toward provision of enhanced healthy menu options, there is a need to understand consumer *evaluation* of menu items. Although required food labeling is relatively new to menus, research on *package labeling* (somewhat akin to display of caloric information in a menu) has revealed that only *certain* consumer segments use food labels (Caswell and Padberg 1992). "Similarly, menu-

labeling studies have shown a strong association between the *target* audience and the effectiveness of nutrition labeling on consumers' food choice" (Yepes 2014: 59), thus impelling scholars to call for research to examine the role of *demographic* factors in menu design (Filimonau and Krivcova, 2017). The present study seeks to address this call partially by focusing on *Millennials*, a generation born between 1981 and 1997 (Fry 2016).

Generation cohort theory (Strauss and Howe 1991) proposed that each generation constitutes a cohort, defined as "the aggregate of individuals (with some population definition) who experienced the same event within the same time interval" (Ryder 1965: 845). This theory has been used widely when examining behavioral differences across various cohorts. Mason and Wolfinger (2001) averred that differences between cohorts occur because of the age, period, and cohort effect (i.e., individuals belonging to the same generation share common life experiences). This thus implies that restaurateurs should not view their target market as the only essential, but consider the different cohorts in their target market and possibly design menus for these different groups. In this research, for ease of explication

and study design, we targeted solely Millennials and how they respond to menu layout.

The goal of this paper is to examine Millennials' reaction to different *menu options* (healthy *and* unhealthy) to discern how their *purchase intention* changes based on the food *item's description* (a) in the presence *or* absence of visual cues—or images—*and* (b) in the presence *or* absence of calorie labeling. Although multiple studies have looked at images of products and their impact on purchase intention (e.g., Kim and Lennon 2008), work considering perceptions of Millennials is limited. Additionally, though Millennials prefer fast food restaurants with selective menu alternatives, counter self-service, and low prices that meet their budgetary restrictions (Filimonau and Krivcova 2017; Mohammad, 2004; Morgan Stanley Research, 2015), little empiricism has explored menu evaluations of Millennials. Indeed, only one published study could be found (Yepes 2014) of Millennials' perceptions of menu information display alternatives (e.g., textual, color coded); however, that investigation examined menu visuals *vis-à-vis* their impact on Millennials' perceptions of perceived attractiveness and influence on food item purchased, *not* purchase intention—the immediate precursor of consumer behavior (Fishbein and Ajzen 1975). As such, to the authors' knowledge, this is the first attempt to examine the effect of visual and written cues on Millennials' intention to purchase healthy/unhealthy food offerings.

Characteristics of Millennials (described below) *vis-à-vis* this study's research focus deems this population especially worthy of investigation. Accordingly, after describing some of these key features of Millennials, as well as selected published empiricism on marketing to this generation, findings from Millennial health- and food-related research is discussed. Theoretical support and concomitant hypotheses are then offered, followed by the investigation's method, results, and implications.

Features of and Selected Research on Millennials

What is a “generation”? Williams and Page (2011: 1, 2) succinctly describe a generation as the following:

[a]...generation...is a group of persons who travel through life together and experience similar events at a similar age...[and thus] share a common social, political, historical, and economic environment. Each generation [as such] has unique expectations, experiences, generational history, lifestyles, values, and demographics that influence their buying behaviors. Not every generation is alike, nor should they be treated by marketers in the same way.

The Millennial generation is estimated to have a critical mass—approximately 83 million (Moreno et al. 2017)—so it is a primary focus of marketers and media. Not only are Millennials large in number, but they are known to be savvy buyers (Bucic et al. 2012; Nowak et al. 2006). Also, numerous consumer product companies consider this generation to have substantial buying power (Barnes 2015; Pate and Adams 2013), as well as keen influence on their families' purchases (Nowak et al. 2006).

Moreover, Millennials manifest other significant characteristics. They embrace digital and social networking media and use them to garner product-related information, as well as influence other such users (e.g., Barnes 2015; Connaway et al. 2008; Pate and Adams 2013). The cohort group is environmentally friendly and socially responsible (Furlow and Knott 2009; Smith and Brower 2012). Members are financially responsible and independent, thus owning brands that provide decent quality at practical prices (Barton, Fromm and Egan 2012; Crowling 2015b). Millennials tend to focus on the present—not on the past nor the future—and make decisions on the spur of the moment (Barton, Fromm, and Egan 2012).

Owing to their enhanced importance, abundant empirical work in marketing has examined Millennials. A foretaste of topics includes the generation's values and lifestyle segments (e.g., Valentine and Powers 2013); preferences for

digital marketing strategies (e.g., Smith 2012); life stage analysis of consumer loyalty (Gurău 2012); perceptions on the environmental friendliness of a product (e.g., Smith 2012); motivation and engagement with shareable digital content (Adams 2015); effect of social networking sites on buyer behavior (e.g., Pate and Adams 2013); as well as purchasing power (Farris et al. 2002). Along with the foregoing, much empiricism has focused on health- and food-related issues, the essence of the present study.

Findings of Millennial Health- and Food-Related Research

Health Research on Millennials. Extensive work on Millennial health issues has been conducted (see Childers et al. [2011] for a compendious review of that literature). . . For instance, Deshpande, Basil, and Basil (2009) examined predictors of the likelihood of college students' eating healthy. They found that this tendency is a function of subjects' perceived importance of eating a healthy diet, barriers (e.g., budget, convenience) to pursuing such a diet, and self-efficacy to undertake eating a healthy diet; interestingly, though, benefits (e.g., salutary outcomes) to eating healthy were unrelated to likelihood of eating healthy. Childers et al. (2011) investigated internal and external factors that affect university students' eating habits. Key phenomena influencing such behavior included one's personal schedule and time management, social (e.g., eating behaviors of dining companions) and emotional (e.g., feelings of anxiety and negativity) aspects, family contributors (e.g., provision of money for healthy eating), desire for weight control, and accessibility of healthy offerings. Wdowik et al. (2001) discerned that college students' perceived importance of health and intention influenced their diabetes management. Garcia and Mann (2003) ascertained that university students' self-efficacy was associated with their resistance to dieting.

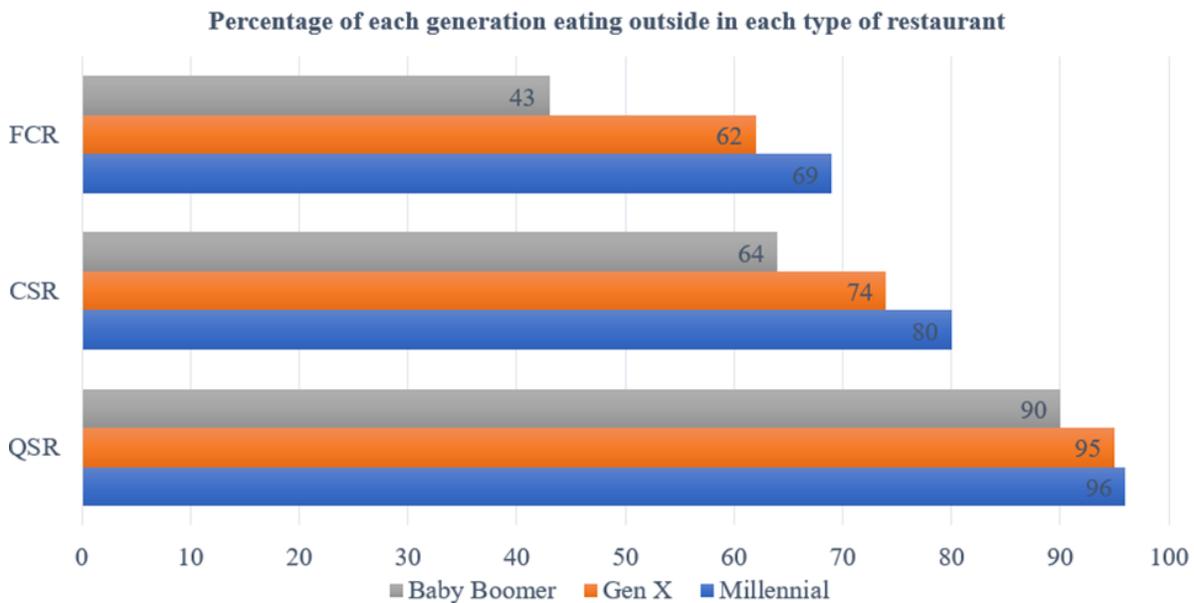
Food Research on Millennials. A surfeit of studies pertaining to marketing of food to Millennials has been conducted. For instance, Geringer, Patterson, and Forsythe (2014) explored U.S. Millennials' purchase intentions of European wine; they observed that consumer experience and brand familiarity influenced the

decision process, that the consumer search process enhanced brand familiarity, that brand familiarity ameliorated their attitude toward the wines, and that attitude augmented intention to purchase European wine. Nowak, Thach, and Olsen (2006) explored whether positive affect induced in vineyard tasting rooms engendered a higher degree of brand equity for the winery; results confirmed the hypothesis. Olsen, Thach, and Nowak (2007) investigated four generations—Millennials, Gen Xers, Baby Boomers, and Traditionalists—vis-à-vis their initial introduction to wine, current wine purchase tendencies, and affect about wine and its image; they obtained both similarities and differentia across the four generations. Palmer and Carpenter (2006) reviewed food and beverage marketers endeavors to “connect with” and to attract children and teen (Millennial) consumers; they concluded with an admonition about how such efforts contribute to obesity in youth. Linnhoff et al. (2017) reconnoitered Millennials' views of genetically modified food and ascertained that abundant education of this cohort is needed to make them cognizant of the surfeit of empiricism that supports the potential benefits and safety of such foods.

The issue of how Millennials perceive food and how marketers should promote food-related items to Millennials is gaining credence because of their acute proclivity for food. In fact, they are known as “the generation that lives to eat,” focus on convenience of food availability, and “eat healthily or intend to” (Manzoori-Stamford 2015). Millennials have been brought up in a racially-diverse and tech-savvy context, so they have been exposed to a broad range of choices of cuisines and food products (Day 2016). Moreover, Millennials influence others in purchasing products and have sway over eating habits of others (Demeritt 2016).

With respect to food products, Millennials tend to behave differently from their counterparts. First, they eat out more than other generational cohorts (Morgan Stanley Research 2015, demonstrated in figure 1). Second, at their current stage of life, Millennials manifest young-adult life-stage factors that influence health choices (Rising and Bol 2016). Third, owing to the relative paucity of discretionary

FIGURE 1:
Restaurants Visited by Each Generation



FCR = fast casual restaurant CDR = casual dining restaurant QSR = quick service restaurant
Source: Alph W wise, Morgan Stanley Research, 2015

income, they often patronize fast food purveyors (Filimonau and Krivcova 2017; Morgan Stanley Research 2015). This confluence of seemingly adverse eating preferences and behaviors begs the question of what food characteristics and marketing strategies can affect Millennials' intention to purchase healthy food options. One of the ways to entice them might be to show them *images* (i.e., pictures) of food items and/or calorie information.

THEORETICAL BACKGROUND AND HYPOTHESES

Millennial preference for pictures is relevant to menu evaluation. For example, Connaway et al. (2008) undertook two studies across several universities to discern how and why people seek and utilize such information. They found that Millennials are technologically and visually oriented and have somewhat of a fondness for pictures over words. Crowley (2015a) asserted that Millennials have a bias for the more picture-based Instagram over the more word-oriented Twitter—both social media venues. Thus, the impact of images (visual cues) on Millennials seemingly should be a

critical issue for restaurateurs. Accordingly, given the general use of calorie labeling on menus, exploring how Millennials perceive options of food items with or without visual cues seemingly has merit.

Use of Food Images

We define food image as a *picture* of the actual food item matching the *description* on the menu. Images play a central role in the food product and service industry. Past research has studied the impact of images on consumers and obtained mixed results. For example, visual evaluations of food were not considered a reliable source of information by consumers (Melton et al. 1996). Imram (1999), though, concluded that visual sensory properties are extremely important, as the “first taste is almost with the eye.” That study emphasized visual cues of food products, as the initial encounter with food is often via the sense of sight. Also, individuals tend to perceive the quality of a product via its image (Hetherington and MacDougall 1992). Further, appearance can influence consumers' perceptions of flavors and food items in general (Hutchings 1994; Imram 1999; Kostyla and Clydesdale 1978). Other

efforts have explored how visual cues have an impact on behavior and preference when individuals select certain food items. Although these investigations have obtained inconsistent findings, the majority has found that images indeed have an impact (Wang et al. 2010; Wansink et al. 2005). When individuals enter a restaurant, then, they receive menus to peruse the offerings. Accordingly, a menu becomes an essential bridge between patrons and the restaurant—and is thus an apt place to display visual cues.

The above-mentioned analyses infers that menus are a key communication device (Bowen and Morris 1995) and selling tool (Pavesic 2005) that can influence behavioral intentions (Fakih et al. 2016). Consumers use menus to satisfy information search before purchase (Mourali et al. 2005) by reading food descriptions and using selectively chosen pictures for unfamiliar food items (McCall and Lynn 2008; Verma et al. 1999). The role that *visual* information plays in menu evaluation (Boonme et al. 2014) is justified from the theoretical underpinnings of previous marketing research on images. Use of images influences consumers' attitude toward an advertisement and brand (Mitchell 1986), information-processing strategies (Edell and Staelin 1983), emotional responses (Chowdhury, Olsen, and Pracejus 2008), product inferences (Underwood and Klein 2002), and consumption volume (Madzharov and Block 2010). Pictures aid brand name and product recall (Kisielius and Sternthal 1984; Shepard 1967; Underwood and Klein 2002). Advertisements with pictures are more favorably received than those without pictures (Mitchell and Olson 1981) and more readily recalled (Childers and Houston 1984; Shepard 1967). Pictures improve perceptions of words in the ad (Mitchell and Olson 2000). However, as related to *menus*, the *wording* (or description) can affect interpretation for individuals in general (Hou et al. 2017).

Use of pictures has generated mixed results in menu evaluations of Americans, Japanese, and Spanish diners who preferred pictures of hot dogs and deli sandwiches, but not pictures of burgers or sandwiches (Verma et al. 1999). Obese and normal weight subjects were compared on their perceptions of visual cues and were both affected when images of food

items were provided (Castellanos et al. 2009). Another study investigated the neural processing that takes place when food pictures are shown to individuals and found that concurrent brain regions were activated when the individual viewed food pictures (Van der Laan et al. 2011). As van der Laan et al. (2011, p. 296) mentioned, "Food selection is primarily guided by the visual system."

Foundation for the current study is predicated on conceptual and empirical work on descriptions of food with or without visual cues. Absence or presence of detailed descriptions (e.g., Bolls and Muehling 2007; Wyer, Hung and Jiang 2008) affect imagery processing (e.g., Petrova and Cialdini 2008; Vassilopoulos et al. 2012). Indeed, visual pictures assist mental stimulation (Elder and Krishna 2012). Individual preference for visual versus verbal information correlates with processing style, although "there is no clear theoretical formulation of the combined influence of visual and verbal information" (Pennings et al. 2014: 359).

In the present investigation, both healthy and unhealthy items were portrayed in a menu with a brief verbal description of the offering. Of chief interest was the impact on Millennials' purchase intention of a particular food item (either healthy or unhealthy) when the menu offering (and its attendant succinct narrative) (a) was presented in a picture (i.e., presence of an image), (b) was presented with calorie information but no picture (i.e., absence of an image), and (c) was presented with both picture and calorie information. The disquisition below leads to the study hypotheses that conform to the preceding three focal issues.

Presence of an Image in the Absence of Calorie Information

Past research shows that the majority of food purchases of individuals are unplanned and thus are impulse purchases (Bellenger et al. 1978; Rebollar et al. 2015; Zhang and Seo 2015). In such cases, visual cues can gain the attention of individuals who are not planning to buy the product (Fenko et al. 2010; Rebollar et al. 2015). Thus, food and restaurant industries often employ such cues to capture impulse buyers (Zhang et al. 2015). Exposure to food

images—such as pictorial advertisements—relative to verbal advertisements brings increased recall (Childers and Houston 1984), thus highlighting the role of visual stimuli (e.g., seeing a menu item) in engaging a response of product interaction (e.g., ordering the food) (Tucker and Ellis 1998). Further, imagining behavioral scenarios like eating a food item through cues like food image affects behavioral intentions (Anderson 1983; Gregory, Cialdini, and Carpenter 1982; Schlosser 2003).

Another study found that consumers report a positive attitude toward a package containing a picture. Accordingly, the picture led consumers to evaluate the brand more favorably (Underwood and Klein 2002). So, overall visual cues or images of food can play an important role in building consumers' beliefs about a product. In contrast, Fletcher et al. (2007) ascertained that exposure to visual images of chocolate—a seemingly unhealthy food—incites food cravings, guilt, and depression. Visual cues also initiate motivation of food intake, leading to over eating (Cornier et al. 2007). These disparate results of presence of images beg the question about the reason behind this situation. Zhang and Seo (2015) discerned that *differences in cohorts* are one of the reasons behind this variance.

Healthy items will be considered viable alternatives more when they are readily available (Hanks et al. 2012). In order to make healthful items more prominent, salience builders are utilized, such as item positioning on the menu (Dayan and Bar-Hillel 2011; Romero and Biswas 2016), menu design elements (Magnini and Kim 2016; Wansink and Love 2014), menu format (such as paper or electronic) (Magnini and Kim 2016; Yepes 2014), menu content (Filimonau and Krivcova 2017), and use of pictures (Fisher 2014; Hou, Yang, and Sun 2017). Some evidence suggests that pictures aid menu selection. Hou et al. (2017) found that for common food descriptors, adding pictures positively affected consumer attitude toward the menu item and purchase intention. Although not a picture of the actual food, symbols denoting healthfulness—such as an icon of a healthy heart or green traffic lights—positively engendered healthful food choice (Boonme et al. 2014; Fernandes et al. 2016).

Food pictures differ from food symbols, and their differences have been addressed. The food attentional task becomes less spatial when food images (à la pictures), compared with symbols (e.g., an asterisk), are used (Yokum, Ng, and Stice, 2011). Consumption of fish increased when the menu had a picture of the sea (Guéguen et al. 2012). Salutory pictures presented in a pamphlet about nutrition education influenced participants' future contemplation of nutritional labels (Pennings et al. 2014).

Although no published studies have considered Millennials' response to pictures on menus, Millennials have been observed to have a preference for photos over words (Crowling 2015a). Elliot and Barth (2012) found that Millennials are more likely to select wine that has an image on the package. Barnes (2015), examining teaching modalities, ascertained that when lectures are accompanied with images, Millennials learned and enjoyed more than when exposed merely to lectures. When creating marketing campaigns, Disney noted the importance of images to convey their story to Millennials (Chitale, Dumancela, and Martik, 2014). When studying Millennials as library users, Carr and Ly (2009) mentioned how Millennials have a proclivity for images versus a text format. Thus, conceivably pictures on menus will affect Millennials' purchase intention of the food item portrayed.

H₁: The presence of the image of a food item on the menu will increase Millennials' purchase intention of that item.

Depiction of Calorie Information in the Absence of an Image

There is an ongoing debate on how Millennials view calorie, or nutritional, labeling *in general*. Some research has suggested that Millennials desire inexpensive and fast meals (e.g., owing to the relative paucity of discretionary income and convenience proclivity) (e.g., Morgan Stanley Research 2015); as such, they seemingly will be inclined to patronize fast food purveyors—thus not benefiting from nutritional information. Other scholars have argued, however, that Millennials are well educated and make deliberate healthy choices (Filimonau and Krivcova 2017). Accordingly,

as noted earlier, college students' milieu (e.g., availability of healthy food offerings, personal schedule, budget issues, eating department of dining peers) affects the likelihood that college students will opt for healthy food alternatives (Childers, Haley, and Jahns 2011; Deshpande, Basil, and Basil 2009; Morgan Stanley Research 2015). Accordingly, the context in which they function may weigh against their consumption of healthy food items.

Although Millennials tend to eat more than other generations, they use taste, value, and quality—not caloric attributes—to determine where to dine (Morgan Stanley Research 2015). Interestingly, though, Millennials also have acute interest in reading nutrition labels (Nogueira et al. 2016), but alongside evaluate healthiness based on freshness, degree of food processing, and natural ingredients, not merely on calories (Morgan Stanley Research 2015). For instance, when exposed to fine dining restaurant menus, the calorie-only option was found to have the lowest attractiveness rating for Millennials when compared with other menu design options (Yepes 2014). Moreover, Millennials have somewhat of a bent toward fast food over healthy food, specifically because of that food genre's larger portions, lower cost, and augmented convenience (Raines 2003). Thus, the foregoing discussion leads to the following hypothesis:

H₂: Depiction of a food item's calories on the menu will have no impact on Millennials' purchase intention of that item.

Depiction of Calorie Information in the Presence of an Image

As noted earlier, Millennials purportedly prefer pictures over words (Crowling 2015b). Healthful menu evaluation research, though, has not yet examined pictures; rather, it has considered symbols instead. Also, as aforementioned, food pictures differ from food symbols.

Research on food symbols has addressed the issue of consumers' food-item choice. Boonme et al. (2014) discovered that symbols—such as heart icons on menus placed next to healthier items—significantly affect healthy food selection. Vaneppe et al. (2016) confirmed that

use of traffic lights on an online menu reduced the number of calories ordered, even when a caloric value was not provided. Sonnenberg et al. (2013) discerned that traffic label symbols in a hospital cafeteria menu influenced healthful purchase intention. Calories and symbols affected Millennials' evaluation of fine dining restaurant menus with such symbols as traffic light only, calories with traffic light, and traffic light with graphic summary having a higher attractiveness rating than the calories-only option (Yepes 2014). Seemingly, then, symbols portrayed in a menu may well attenuate the presence of caloric information. Similarly, an image of the food itself may be beneficial for Millennials, thus reducing the impact of depiction of calorie information.

H₃: The presence of the image of a food item on the menu will have a stronger impact on Millennials' purchase intention of that item than will the depiction of the same item's calories on the menu.

H₄: The presence of the image of a food item on the menu will strengthen the impact of the depiction of the item's calories on the menu vis-à-vis Millennials' purchase intention of that item.

METHOD

The study investigated the impact of the image of a healthy or unhealthy food item on consumers' purchase intention in the presence or absence of calorie information (attendant with descriptive information of that item). A sample of 416 individuals (with an alpha of 0.05, effect size of 0.25 and power of 0.90 with 8 groups) was recruited for this investigation from a school of business in a large southern university in the United States. Subjects were rewarded partial credit for participating in the optional survey, which was administered online via a survey link designed by Qualtrics. Sample demographics were as follows: (a) 155 were male; 261, female; (b) 405 were between 18 to 24 years old; and (c) 260 were undergraduate students, and 156 had achieved solely a high school diploma. Because subjects represented the Millennial generation, income of these individuals was not asked.

To test the hypotheses, two types of food items were chosen: one healthy—a salad—and one unhealthy—a burger. These kinds of food alternatives were selected for two reasons. First, they tend to represent seemingly opposites of healthy versus unhealthy menu offerings. As such, they afford generalization of the findings across dissimilarly-valenced food items. Second, as noted earlier, Millennials are a picture in contrast. Owing to their personal situation (e.g., income level), they have a proclivity for fast food. But, they have also been found to make deliberate choices vis-à-vis healthy food. Therefore, this inconsistency suggested that exploration of bipolar food offerings was warranted.

A three-way interaction (2 (image: presence vs. absence of image) x 2 (calories: presence vs. absence of calorie information) x 2 (food item: healthy versus unhealthy)) between subjects' design was utilized. Each participant was randomly assigned to one of the eight experimental conditions. Each participant was presented with (a) either a healthy (salad) or an unhealthy (burger) food item, (b) with an image or no image, or (c) with or without calorie information as optional categories mentioned on the menu, per the mixed design. A

description of the food item was present in *each* condition to maintain menu realism, thus reflecting an actual menu item that includes food narratives (McCall and Lynn 2008). Shown in Figure 2 are the pictures and descriptions of the two food items used in the experiment. Descriptive statistics for each condition are presented in Table 1.

The questionnaire began with subjects' examination of the condition followed by their completion of purchase intention and demographic questions. Purchase intention was assessed with 3 questions from Elder and Krishna (2012): "I would purchase this salad/burger," "I would consider buying this salad/burger," and "The probability that I would consider buying this salad/burger"—following Grewal et al. (1998).

RESULTS

Hypothesis 1 posited that the presence of an image of a food item on the menu would increase Millennial's purchase intention (PI) of that item. A two-way (2 (image: present or absent) X 2 (food choice: healthy or unhealthy)) ANOVA revealed a significant effect ($F[1, 412] = 5.077; p < .001$, partial eta

FIGURE 2:
Stimuli used for Study 1 – Visual Cue for Salad and Burger

Description	Visual Image
This salad combines crispy lettuce, crispy chicken, dried cranberries, apples, and blue cheese, all topped with apple cider dressing.	
This burger features a ¼ lb of savory flame-grilled beef (based on pre-cooked patty weight), melted American cheese, spicy bacon sauce, crispy lettuce, juicy tomatoes, sliced onion, crunchy pickles, and smoked bacon served on a warm toasted sesame seed bun.	

TABLE 1:
Descriptive Statistics

Dependent Variable: PI					
Health	Calorie	Image	Mean	Std. Deviation	N
Healthy	Presence	Presence	4.89	1.832	50
		Absence	5.34	1.736	61
		Total	5.14	1.790	112
	Absence	Presence	4.68	1.776	46
		Absence	4.93	1.940	50
		Total	4.81	1.862	96
	Total	Presence	4.79	1.804	97
		Absence	5.16	1.837	111
		Total	4.99	1.829	208
Unhealthy	Presence	Presence	4.05	1.935	54
		Absence	4.36	2.053	53
		Total	4.20	1.996	107
	Absence	Presence	4.48	1.971	49
		Absence	4.95	1.982	51
		Total	4.72	1.985	100
	Total	Presence	4.26	1.960	103
		Absence	4.65	2.035	104
		Total	4.45	2.005	207
Total	Presence	Presence	4.45	1.929	104
		Absence	4.89	1.948	114
		Total	4.68	1.949	219
	Absence	Presence	4.58	1.877	96
		Absence	4.94	1.956	101
		Total	4.76	1.924	197
	Total	Presence	4.51	1.903	200
		Absence	4.91	1.950	215
		Total	4.72	1.936	416

squared [η_p^2] = .00)—Table 2—but in the *opposite* direction of the hypothesis. Mean PI in the presence of an image for a *healthy* item was 4.79, but the mean PI in the absence of an image was 5.16. Relatedly, for an *unhealthy* food item, the presence of an image resulted in a mean PI of 4.26, whereas the absence of the image produced a mean PI of 4.65.

Collectively, these outcomes infer that the absence of an image induced higher purchase intention than the presence of an image. Thus, Hypothesis 1 was rejected.

Hypothesis 2 proposed that the depiction of calorie information would not have an impact on PI of a healthy or unhealthy food item. This

TABLE 2:
Hypotheses Test Results

Hypothesis	Variables	F	Sig.	Partial Eta Squared
H ₁	Health * Image	5.077	0.001	0.00
H ₂	Health * Calorie	9.779	0.01	0.012
H ₃	Calorie * Image	0.007	0.934	0.00
H ₄	Health * Calorie * Image	14.251	0.01	0.017

hypothesis was tested using a two-way (2 (calories: present or absent) X 2 (food choice: healthy or unhealthy)) ANOVA. The results revealed that there was a significant difference ($F[1, 412] = 9.779$; $p < .01$, partial eta squared $[\eta_p^2] = .012$) between PIs in the presence versus the absence of calorie information. Interestingly, though, the impact was in the *opposite* direction for the two kinds of food alternatives. PI *increased* in the case of the *healthy* item (presence mean = 5.14/absence mean = 4.81) but *decreased* in the case of the *unhealthy* alternative (presence mean = 4.20/absence mean = 4.72). Accordingly, H₂ was rejected.

Hypothesis 3 explored the impact on PI in the presence of an image versus presence of calories and predicted that presence of an image would have a stronger impact on PI compared with the depiction of calorie information. A two-way (2 (image: present or absent) X 2 (calorie depiction: present or absent)) ANOVA was performed. Findings revealed a non-significant impact on PI ($F [1, 412] = 0.007$; $p = 0.934$, partial eta squared $[\eta_p^2] = .00$). The mean PI with the depiction of calories when the image was not shown was 4.89, but decreased to 4.45 in the presence of an image. Similarly, with no depiction of calories, the absence of an image led to a mean PI of 4.94—which was higher than with the presence of an image ($M = 4.58$). Thus, H₃ was not supported.

Hypothesis 4 proposed that the presence of an image will further strengthen the impact of the depiction of calories on the menu on PI. A three-way (2 (images: present or absent) X 2 (food choice: healthy or unhealthy) X 2 (calorie: present or absent)) ANOVA was undertaken. Findings showed that instead of strengthening the impact of calorie information on PI, it significantly *decreased* the effect

further. Mean PI in the presence of calorific information but in the absence of an image was 5.34 for a healthy food item, which decreased to 4.89 when the image was presented. Further, for an unhealthy food item, with the depiction of calorific gen, mean PI was 4.36 when there was no image, but declined to 4.05 when a visual display was depicted ($F[1, 412] = 14.251$; $p < .01$, partial eta squared $[\eta_p^2] = .017$). So, H₄ was not confirmed.

DISCUSSION

This research to some extent contributes to the growing body of literature that addresses calorie labeling on menus and consumer reaction to menu items. Although there are trends toward more healthful options on menus, inconsistent results have been reported pertaining to the effect of calorie information on menus (Fernandes et al. 2016; Swartz et al. 2011), as well as a knowledge gap about how images influence healthful food selection (Hou et al. 2017). Theoretically, this study provides some evidence that helps explain Millennials' food choices—thus attending partially to address scholars' calls for targeted demographic research to understand menu evaluation (Filimonau and Krivcova 2017).

Results from the study were basically *contrary* to expectations. Using two distinctly different food items—healthy and unhealthy—findings were similar for *both* kinds of food items except when solely calorific information was provided. Although Millennials typically have a preference for pictures (over words), presence of a food offering's image did not positively affect their intention to purchase that alternative (H₁); rather, *absence* of the picture augmented it.

Furthermore, *presence* of calorie information increased Millennials' purchase intention for a healthy food item but decreased it for an unhealthy food offering; no impact, however, was posited (H_2). Moreover, when comparing the impact of the presence of a food item's image versus the presence of its calorie information on purchase intention, Millennials' purchase intention of the food alternative was not affected differentially (H_3); an image was proposed to have a greater effect than calorie information.

These unexpected findings may be due to differences in processing styles; indeed, to date there remains no clear theoretical rules of consumers' processing both visual and verbal information (Pennings et al. 2014; Wyer et al. 2008). Although mental simulation suggests that visual depiction is easier to process (Elder and Krishna 2012), recent work has found that perceived healthfulness and taste of food can moderate this impact (Xie et al. 2016). Simmons et al. (2005) observed that a picture of cookies created a response in the brain's taste cortex. Perhaps presence solely of the image of a food item had no *positive* effect because consumers perceived from the picture that healthy foods would be unsavory (Hanks et al. 2012) and unhealthy foods would be artificially flavorful (Harrison and Jackson 2009), thus inducing Millennials to eschew such offerings when exposed to the respective image. Relatedly, likely depiction *solely* of calorie information accompanied by an alternative's description in the menu led subjects to consider the calorie information, thus impelling them to opt for healthy food with low calories and not opt for unhealthy food item when calorific information was given. Therefore, the current investigation makes a modest theoretical contribution to imagery processing/mental simulation literature by uncovering the authenticity of these in healthy and unhealthy menu evaluation.

Relative to other generation cohorts, Millennials have different concepts of the meaning of "healthy" and define that term by freshness, organic, local production, and perceived corporate social responsibility of the purveyor (Cone Communications 2015; Kim and Ham 2016). Besides, they regard unhealthy foods as unnatural, artificial, or

processed, as well as possessing artificial ingredients such as excessive amounts of sugar, preservatives, chemicals, and additives (Harrison and Jackson 2009). The *combined* presence of an image of a healthy/unhealthy viand and calorie information unexpectedly *decreased* (rather than increased) purchase intention (H_4). Perhaps this finding may be attributed to cognitive load theory. It proposes that because working memory is limited, learners may be bombarded by information; accordingly, seeing the image with both caloric information and an attendant description might have induced cognitive overload (Sweller 1988). Indeed, consumers cope with overload by choosing to be uninformed about purchase options (Malhotra 1982). As such, Millennials may have been demotivated owing to this overload to intend to purchase the healthful/unhealthy food item (Caswell and Padberg 1992).

McCall and Lynn (2008) suggested that designing menus is a form of psychology. Accordingly, this is why understanding consumer behavior vis-à-vis menu evaluation is important. At the same time, today's contemporary consumers are different from their earlier counterparts, thus hindering easily uncovering of customers' food information needs, irrespective of cohort group (Filimonau and Krivcova 2017). As an example, the use of marketing images in marketing materials typically motivates positive consumer outcomes. In terms of Millennials' reaction to food items on a menu, though, a picture evidently is not worth a thousand words!

Managerial Implications

Study findings offer some tentative managerial implications. If restaurateurs are targeting Millennials to sway them to purchase their food items, they could focus on description, not on image. The research here found that any image of a healthful or an unhealthy item did not influence Millennials' purchase intention of such alternatives. Given Millennials unique terminology regarding "healthy," emphasizing freshness, organic, local production, and perceived corporate social responsibility of the purveyor seems relevant for healthy alternatives, whereas the perception of unhealthy food items containing preservatives

and appearing artificial and unnatural seems true only in the presence of an image. Indeed, when images were *not* presented, caloric information increased Millennials' PI for a healthy item, but decreased it for an unhealthy offering. This implies that restaurateurs may consider using alternative approaches when presenting an unhealthy item vis-à-vis a healthy viand.

Menu labeling is part of an expanding trend in the use of public policy to improve healthful choices (Bleich et al. 2015). Although calorie labeling is often a government requirement (Yepes 2014), this study's findings suggest that different consumer segments may define healthy/unhealthy in different ways and, therefore, regulators should be informed about consumer preferences when evaluating healthy as well as unhealthy options. Although Millennials have childhood tendencies that transcend into adulthood which can lead to weight problems (Ogden et al. 2014), calories do seem important to them, per the study findings, but seemingly not an effective means for motivating them to alter their eating behavior in the presence of images. Accordingly, this brings into question the extant calorie requirements on menus and highlights the need for regulations that are consistent with target market perceptions, preferences, and cognitive processing.

Limitations and Future Research

The current work possesses certain limitations that are suggestive of avenues for subsequent exploration. First, solely Millennials were examined. As such, no comparisons could be made between Millennials and other cohort generations vis-à-vis the presence/absence of menu images and presence/absence of calorie information on purchase intention. Future empiricism should incorporate other generations so that such comparisons could be made, as well as to determine if the findings obtained in this study conform with the comparative examinations.

Second, although results in the image and calorie information condition did affect purchase intention of the food item mentioned, one cannot dismiss the possibility that participants made decisions based on the single

food item that was presented to them. Indeed, more than one food item might have changed respondents' opinions about the purchase of one particular food item based on images and calories; having a multiplicity of food alternatives, after all, is the norm. Further work should rectify this situation.

Third, the study employed an experimental design in an artificial setting (i.e., an online survey). Future research could test the impact of images on actual menus *in restaurants* to enhance realism and generalizability of results. Also, the two food items tested in this investigation were a healthy food item, a salad, and an unhealthy food item, a burger. Subsequent empiricism could incorporate other food offerings in different types of restaurant settings to enhance realism (e.g., viands from other cuisines—Chinese or Indian—different kinds of snack foods).

Fourth, the verbal descriptions of the two food items were different in their word count, as the salad had fewer words than did the burger. This occurred because of the number of ingredients that were used in the dissimilar offerings. Consequently, the cognitive load for the subjects may have varied per the viand, thus affecting PI. Future work should control for this issue.

Finally, the scope of the study was constrained. Consequently, other potentially germane variables may have influenced the results markedly. Therefore, additional research might examine such constructs as the role of information-processing styles on both visual and written menu evaluation, using both healthful and unhealthy images, as well as cohort groups' definitions of "healthy" and "unhealthy."

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