ASSOCIATION FOR CONSUMER RESEARCH

Labovitz School of Business & Economics, University of Minnesota Duluth, 11 E. Superior Street, Suite 210, Duluth, MN 55802

Ambient Music and Food Choices: Can Music Volume Level Nudge Healthier Choices?

Dipayan Biswas , University of South Florida, USA

Kaisa Lund, Linnaeus University, Sweden

Courtney Szocs, Portland State University, USA

Ambient music is ubiquitous in almost all restaurant and retail settings. We examine how the ambient music influences food choices. The results of three experiments (one field study and two lab studies) show that low volume (vs. high volume or no) ambient music nudges consumers towards more healthful food choices.

[to cite]:

Dipayan Biswas , Kaisa Lund, and Courtney Szocs (2016) ,"Ambient Music and Food Choices: Can Music Volume Level Nudge Healthier Choices?", in NA - Advances in Consumer Research Volume 44, eds. Page Moreau and Stefano Puntoni, Duluth, MN : Association for Consumer Research, Pages: 53-58.

[url]:

http://www.acrwebsite.org/volumes/1022092/volumes/v44/NA-44

Choosing Healthy: Recent Findings on Environmental Factors that Shape Choice and Consumption

Chair: Kevin L. Sample, University of Georgia, USA

SESSION OVERVIEW

The purchase and consumption environment for food choices provides a myriad of environmental cues for consumers to navigate. For example, prior research reveals that consumers miss important health information by allocating their attention toward certain labels and environmental information rather than more important health cues and caloric density (Wansink and Chandon 2006; Wansink 2004). Further, poor estimation of container volume leads consumers toward unhealthy food choices (Chandon and Ordabayeva 2009), and due to financial savings consumers will even sacrifice health goals (Haws and Winterich 2013).

So, how do consumers miss important information or deviate from planned health decisions? The various factors impinging on cognitive resources can severely alter or nullify healthy choices. Ambient music, the weight of a food tray, a higher or lower price than expected, and difficult to understand labels can all influence consumer decisions in regards to healthy choices, and this session seeks to shed light on each of these areas. As a whole, this session tries to answer the following question: How can factors apart from the food itself specifically impact healthy consumption behavior? Further, what can be done to mitigate poor choices when consumers are overwhelmed by environmental information? The papers in this session address these and other gaps in understanding environmental influences on health perceptions and healthy decisions by showing the following: 1) healthy choices increase in the presence of a low volume level of ambient music, 2) an increase in physical burden on consumers during a shopping episode leads to less healthy decisions, 3) consumers utilize pricing information when the healthiness of a product is ambiguous, and 4) presenting nutrition information in a new format (Calories per Gram) can improve food choices.

First, Biswas, Lund, and Szocs show that the ever present ambient music in eateries and stores plays a critical role for healthy decision making. Following, Tal et al. demonstrate the propensity for physically depleted consumers, even if this depletion is somewhat minimal from such things as carrying bags, to make less healthy food choices. Next, Haws, Reczek, and Sample expose the intuition that healthy food is more expensive, and demonstrate how this belief affects perceptions of the healthiness of food and the importance of associated health claims. Finally, Sevilla and Wansink establish the usefulness of the presentation of nutritional information through a Calories per Gram label as compared to the ubiquitous Nutrition Facts panel. They show that the use of this format helps consumers understand the relationship between calories and serving size and leads to less caloric intake in subsequent consumption opportunities. Together these findings show that there are countless environmental factors that may alter healthy consumer behavior.

This session offers a new appreciation of consumers' health choices with respect to environmental cues. Not only do these papers provide insight into understanding the complexity of food decision making, they also move us further in our ability to market responsibly and protect consumer welfare by understanding how the environment is impacting and being utilized by consumers in relation to healthy food choices.

Ambient Music and Food Choices: Can Music Volume Level Nudge Healthier Choices?

EXTENDED ABSTRACT

We examine how ambient music might influence choices between healthy and unhealthy options. Our choice of a sensory factor, such as ambient music, to nudge healthful consumption is influenced by the fact that sensory cues tend to influence behavior in subliminal manners (Biswas et al. 2014) and hence such cues are non-restrictive in nature and as a result are often more effective than restrictive regulatory policies.

While prior research has examined several interesting factors that can influence choices between healthy and unhealthy options (Romero and Biswas 2016), no study, to the best of our knowledge, has examined how ambient music might influence choices between healthy/unhealthy options. Similarly, while extant research has examined effects of ambient music for a wide range of factors (Garlin and Owen 2006), the effects of ambient music on choices between healthy and unhealthy options have been unexplored.

Focusing on the effects of ambient music on food choices is practically and theoretically relevant, especially since ambient music is ubiquitous at almost all types of restaurant/retail outlets. While there are several dimensions to music, we focus on music volume mainly because from a managerial perspective, it is the easiest to change at very short notice and without much resource commitment. Also, examining cross-modal influences of an auditory-based sensory cue like ambient music loudness on eating behavior can provide interesting conceptual insights.

Loudness of any sound, including ambient music, is the energy associated with the sound. When music is played in the ambience, the sound waves get transduced into neural impulses by the inner ear and the neural information then travels through the brain system to reach the auditory cortex (Zatorre 2005). While it is still not clear as to how music loudness can influence physiological reactions through the neurophysiology system, one plausible explanation put forward is that music influences motor and physiological reactions through

sensory-motor feedback circuits (Zatorre 2005). Hence, loud music tends to make people lively and the loudness level of ambient music tends to have a direct effect on heart rate and arousal, whereby louder ambient music tends to increase overall heart rate and arousal level (Edgeworthy and Waring 2006). In essence, louder music tends to make people more excited and aroused (Witt 2008). In contrast, lower levels of music volume (in the range of around 50 dB) tend to make people relaxed and calm (Nilsson 2009).

Higher levels of excitement (and stress) tend to enhance preference for high energy and high fat foods (Oliver et al. 2000). This is probably because sweet and fatty foods help in reducing high levels of excitement (and stress) levels (Gibson 2006). Moreover, when emotionally charged up or upset, internal restraints and self-control break down, leading to greater eating of unhealthy foods (Baumeister 2002). The opposite pattern of effects occurs when people are in a relaxed state, whereby there is greater self-efficacy for controlled eating under higher levels of relaxation (Manzoni et al, 2009). This implies that lower (vs. higher) volume ambient music will lead to healthier food choices. Accordingly, we hypothesize that low (vs. high) loudness levels of ambient music will enhance choice likelihood of healthy food options. We empirically test this with three studies.

Study 1 was a field experiment conducted at a café in collaboration with the café management. The study had two manipulated conditions – low (55dB) versus high volume (70 dB) of ambient music being played on two random days. The volume levels were determined based on prior research (Witt 2008). The key measure was café patrons' food/beverage purchases from the menu. The items from the menu were a priori coded as healthy, unhealthy, or neutral. We focused only on the "healthy" and "unhealthy" items. A higher percentage of healthy items were sold when the ambient music loudness level was low (vs. high) (42.92% vs. 32.49%; $\chi^2 = 4.79$, $p < .05$). This supports our hypothesis.

Next, study 2 replicated these effects in a lab setting and also compared the outcomes to a control condition. The study had three between-subjects manipulated conditions (ambient music: absent vs. low volume vs. high volume). The choice options involved choosing between a fruit salad and a chocolate cake. The results of a logistic regression show a significant effect of ambient music condition on food choice (Wald $\chi^2 = 6.63$, $p < .01$). Follow-up tests show that consistent with our hypothesis and the findings of study 1, participants chose healthier options to a greater extent with low (vs. high) volume ambient music (86.36% vs. 56.52%; $\chi^2 = 4.87$, $p < .05$). Also interestingly, the choice outcome for the control ("no music") condition was similar to the "high volume" condition (50.0% vs. 56.52%; $\chi^2 = .21$, $p = .65$) and significantly different from the "low volume" condition ($\chi^2 = 7.09$, $p < .01$).

Next, study 3 directly examined the underlying process. If our theorizing holds, then the effects observed in studies 1 and 2 should be weakened when relaxation is induced. Study 3 tested this hypothesis with a 2 (ambient music volume: low vs. high) X 2 (relaxation induced vs. not) between subjects experiment. The first factor was manipulated in the same manner as in study 2. The second factor was manipulated through a relaxation priming task. Fruit salad and chocolate cake were the healthy/unhealthy options.

The results of a logistic regression reveal a significant interaction effect ($\chi^2 = 3.88$, $p < .05$). When relaxation is not induced, consistent with the effects observed in studies 1 and 2, low (vs. high) volume ambient music leads to healthier choices (83.33% vs. 54.17%; $\chi^2 = 4.75$, $p < .05$). In contrast, inducing relaxation attenuates this effect (80.0% vs. 82.76%; $\chi^2 = .06$, $p = .81$).

The results of our experiments show that consumers tend to have higher preference for healthier options when ambient music is of low volume versus when it is high volume or absent. Relaxation induced by music volume seems to be the underlying process for these effects. Our findings have implications for cross-modal influences of auditory cues on food choices.

Heavy Choices: Exertion and Food Choice Healthiness in Field Settings

EXTENDED ABSTRACT

Food choices are determined by a variety of situational factors, with consumers' own physical states playing a central role. A broad range of factors from consumers' hunger (Tal and Wansink 2013; Wansink et al. 2012) to their emotional states (Oliver et al. 2000) alter food choice, and specifically affect healthiness and quantity eaten. In general, many consumer choices in the food domain are not deliberative, and so are prone to a variety of environmental influences (Wansink 2004).

One central factor that interferes with food choices is consumers' cognitive resources. Consumers have limited resources available to monitor and control choices (Baumeister et al. 1998). Resource depletion interferes with consumer choice in general (Baumeister et al. 2008). Generally speaking, reduced resources prevent consumers from exerting self control, and so result in increased impulse purchases (Baumeister et al. 2002; Faber and Vohs 2004).

In the context of food, resource depletion can translate to increased eating or choice of less healthy foods (e.g., Shiv and Fedorikin 1999; Hofmann et al. 2007). Resistance of tempting foods requires regulatory resources, such that even exposure to them can deplete regulatory resources (Muraven et al. 1998). Exposure to tempting foods in choice settings in turn presents consumers with a task that requires them to override the natural pull of the tempting foods by engaging regulatory resources to exert control. Consequently, when depleted, consumers engage in more indulgent eating behavior (Vohs and Heatherton 2000).

A range of activities can rob consumers of their cognitive resources. Suppressing thoughts, feelings, and engaging in cognitively demanding tasks can all deplete resources (Muraven et al. 1998). Even making effortful choices all deplete consumers regulatory resources (Vohs et al.2014), and result in impairments in subsequent decision making.

Notably, most documented evidence demonstrating ego depletion demonstrates depletion following tasks that require cognitive, rather than physical, effort. However, it is now known that regulatory resources correspond to certain physical realities, such as the body's glucose levels (Galliot et al. 2007). From that perspective, anything that saps the body physically should lead to subsequent deterioration in self control. In the context of food, this would translate to increased eating.

In the current work, we explore whether physical depletion, generated by carrying heavy weights in the form of shopping bags (study 1), people's own backpacks (study 2), or serving dishes such as plates (study 3) does indeed lead to increased eating. Studies 1 and 2 provide field demonstrations of the phenomenon, whereby burdened consumers choose more caloric (study 1) and less healthy (study 2) foods. Study 3 explores the phenomenon in a more controlled lab setting.

In our first study, trained observers recorded the number of shopping bags held by shoppers (N = 178) at eight food courts across the US and estimated the calories in their meals. The researchers were blind to the hypotheses of the study, and recorded a series of

other variables to preclude guessing of the hypotheses. Though such estimates cannot be precise, prior to observation, researchers underwent training in calorie estimation. When possible, researchers used objective calorie measures for the foods ordered. Those carrying a greater number of packages ordered foods with a greater number of calories: $F(1, 176) = 5.47$, $p = .02$. The findings demonstrate that the extent of burden is associated with choice of higher calorie meals.

In study 2, we wished to focus on choice healthiness rather than quantity, and demonstrate that burden influences not merely caloric pursuit but general healthiness of food. Further, we also measured subjective exertion to show its role in influencing food choice, by measuring perceived heaviness of the bags they carried on a scale of 1 (light) to 7 (heavy). We recruited cafeteria attendants (N = 87), and recorded their choices among 7 dishes offered in the cafeteria, coded as healthy or not according to pre-set standards. We found that participants who perceived their bags as heavier chose less healthy foods: $p = .029$.

To test the results in a more controlled setting, we conducted two lab studies. In a follow up lab study utilizing heavier (1252 grams) and lighter (491 grams) plates, participants carrying heavier plates chose a greater number of unhealthy foods (2.64 vs. 1.81) in a binary choice task, $F(1,51) = 6.63$, $p = .013$.

Burden appears to lead to choose less healthy and serve more food. Engaging in a physically effortful activity such as carrying a heavy backpack or even serving dish reduces regulatory resources, leading to increased food consumption. We demonstrated this across a range of stimuli that are prevalent in consumers natural environments, in both field and a lab setting, and with ecologically valid choices, demonstrating the importance of the phenomenon to actual consumer behavior.

Healthy Diets and Empty Wallets: The Healthy=Expensive Intuition

EXTENDED ABSTRACT

Is this food healthy? Tasty? Affordable? Satisfying? Consumer decision making regarding foods is a belief-laden, complex, and important issue significantly impacting overall health. Prior research examining consumer lay theories with respect to food consumption has shown this, such as the belief that unhealthy products are tastier (Raghunathan et al. 2006). Clearly, underlying beliefs in the relationships among the various factors driving food choices are critical in understanding food decision making.

Health and financial concerns are two factors subject to consumer beliefs that are often in conflict in consumer decision making, for example when offered super-sized pricing, consumers value finances over health by choosing larger sizes with lower unit-prices (Haws and Winterich 2013). Rehm et al. (2011) and Larson et al. (2009) have provided evidence suggesting that a healthier diet may indeed be more expensive, but Carlson and Frazao (2012) have demonstrated that unhealthier diets can be more expensive depending on how it is assessed. Therefore, an understanding of the beliefs behind these factors of health and cost is crucial in understanding food decision making. We examine beliefs about the relationship between the healthiness and expensiveness of food products at the level of the individual consumer in a series of experimental studies, proposing and demonstrating that consumers incorporate a lay theory that healthier products are more expensive, leading to intuition-based inference making, food choice, and more global evaluations of health claims.

In study 1, 108 MTurk participants were provided with information about the health grade of a granola product, with the grade being either an "A-" or a "C". Following this manipulation, participants were asked to rate how expensive they thought the product would be compared to other similar products on a 7-point scale. As expected, the product rated as healthier was perceived to be more expensive than the less healthy product ($M_{healthy} = 5.15$ vs. $M_{unhealthy} = 4.51$, $F(1, 106) = 6.29$, $p<.05$).

In study 2, we simultaneously examined how information about product price impacted perceptions of healthiness and how information about healthiness impacted perceptions of product price when the actual food product was consumed. After being provided with information about either the price ($.25 or $2.00) or healthiness level (independent health grade: A- vs. C), participants were asked to indicate the relative healthiness and expensiveness of the product compared to other similar types of products. We examined the contrast of healthiness perceptions based on the cheap versus expensive manipulation and found that the cheaper product led to lower perceptions of healthiness than did the more expensive product ($M_{expensive} = 4.77$ vs. $M_{cheap} = 3.83$, $t(137) = 2.97$, $p<.01$). Similarly, the less healthy product led to lower perceptions of expensiveness than did the healthier product ($M_{healthy} = 4.34$ vs. $M_{unhealthy} = 3.51$, $t(137) = 5.64$, $p<.001$). The results of this study suggest that the healthy = expensive intuition operates in both directions, that is, when an item is positioned as more expensive, consumers perceive it to be healthier, and when a product is positioned as healthier, consumers perceive it to be more expensive.

In study 3, we presented 38 participants a scenario in which they were in charge of choosing an entrée that would better meet a goal to be healthier. Following a health goal prime, participants were presented with two different chicken/pasta dishes selected to be similar in terms of healthiness, based upon actual nutrition information. We counterbalanced which option was more expensive, using price points of $15 and $22, and the order of presentation of the options was randomized for each participant. A chi-square test revealed differences in choice selections consistent with the notion that whichever option was more expensive was selected to be more likely satisfy the healthier goal (Chi-square = 5.16, $p<.05$). Essentially, choice shares between the options reversed such that whichever entrée was listed as the higher price was selected more than twice as often as the other option. Therefore, study 3 provides evidence that beliefs about the link between healthiness and expensiveness impacted choice.

In study 4, the 197 participants were asked to make a series of choices structured as a grocery shopping trip for a family of four. Half of the participants were explicitly told to imagine that they were on a budget. Participants were presented with 26 grocery choices, 13 of which were pairs pretested to differ in healthiness perceptions. An analysis of the number of choices of the less healthy products show that the participants in the budget condition were less likely to choose the healthier products ((M=5.69) than those in the control condition (M=7.17; $F(1,195)=14.30$, $p < .001$), indicating that when given a goal to conserve money, participants chose less healthy options as a means to do so.

Finally, study 5 examines how beliefs that healthy=expensive impacts broader beliefs about healthiness. Specifically, 115 participants were shown a set of 4 trail mix options in which one mix was labeled as the "Perfect Vision Mix" and said to contain DHA for eye health. Participants either saw a price consistent with the other three options or 20% higher for the focal trail mix. In this case, the dependent measures were perceptions of the importance of DHA and intentions to take actions related to consuming DHA and protecting eye health. All four measures (i.e., "How important is it that a healthy diet include DHA?" 1 = not at all important, 9 = very important) showed that seeing the premium price increased perceptions of the importance of the DHA/eye health claim. For example, those

in the higher price condition thought that DHA was a more important part of their diet than did those in the average price condition (M_{high}=4.93 vs. M_{low}=4.11, F (1, 114)=4.89, $p < .05$). .

In summary, we have established a basic link demonstrating a consumer lay theory linking healthiness and expensiveness. This intuition led to lay inferences regarding perceptions of health and price, differences in choice patterns, and more general perceptions of the importance of health claims, suggesting significant implications for food decision making.

Introducing the "Calories per Gram" Label to Promote Healthy Food Choices

EXTENDED ABSTRACT

Past research has shown that consumers tend to make unhealthy food choices even when they attend to caloric information and intend to make healthy decisions (e.g. Balasubramanian and Cole 2002). One factor responsible for such problem is manufacturers' lenient following of the regulations provided by the Nutritional Label and Education Act (NLEA) of 1990, which establishes the portion size that constitutes one food serving. Despite this regulation, manufacturers regularly report smaller serving sizes than established by the NLEA, often with the intention to lead consumers to believe their products have fewer calories and are healthier than they actually are (Mohr, Lichtenstein and Janiszewski 2011). Given eating restrained consumers' (Herman and Polivy 1980) tendency to look for licenses to indulge (e.g. Fitzsimons, Nunes & Williams 2007; Wilcox et al. 2009), it is not surprising that they tend to interpret the ambiguity of such caloric information in a way that allows them to maximize consumption (e.g. Aydinoğlu and Krishna 2011). Furthermore, serving size issue aside, consumers often overvalue the importance of consuming a product containing an absolute lower number of calories (e.g. a small donut vs. a large bagel) to the detriment of attending to other important food attributes such as caloric density (e.g. Wansink 2004), that is, the relationship between the size of a food item and the absolute number of calories it contains. Caloric density has been shown to be an important predictor of caloric consumption (Rolls et al. 2004), as people become more full by the weight of a food than by the amount of calories it contains (Rolls, Bell and Waugh 2000; Rolls et al. 1998; Rolls, Morris and Roe 2002). Thus, this suggests that consuming foods that are high on caloric density often results in an overall higher amount of calories ingested.

These past findings suggest that consumers may benefit from cues or instruments that hint them towards consuming foods that have a lower number of calories per gram or a lower caloric density, even if they contain a larger amount of calories due to their higher volume (e.g. a large bagel vs. a small donut), since these are more satisfying and will likely decrease subsequent consumption. The current work aims to introduce and test the effectiveness of one such tool: the "Calories per gram" label. By introducing this instrument, we aim to teach consumers to make more informed and healthier food choices that may lead them to reduce their total caloric intake. We argue that this metric achieves this objective by allowing consumers to easily compare the caloric density across different options that may vary on their weight and total calories.

In four studies we show that the "Calories per gram" label leads consumers to reverse their choices in favor of healthier options that have a lower caloric density (fewer calories per gram) even when these have an absolute higher number of calories. Study 1 (N=288) showed initial evidence in favor of the effectiveness of the label in a design where participants selected a bagel or a donut. In this study the bagel had a higher number of calories than the donut but a lower calories per gram ratio. We obtained that when participants only had access to the traditional nutritional information they were more likely to pick the donut (M_{donut}=52.8%) and believed this item was healthier (M_{donut}=53.5%). However, this pattern reversed in the presence of the label, as people were more likely to pick the bagel (M_{bagel}=61.8%; $z = 2.49$, $p = .01$) and believed it was healthier (M_{bagel}=62.5%; $z = 2.72$, $p < .01$). This suggests that using the label nudges consumers towards making healthier choices and helps them realize which item is healthier even if it has an absolute higher number of calories.

Study 2 (N=160) used a similar paradigm and replicated the effect with the use of packaged products: granola bars and chocolates. As expected, we obtained that the healthier item, the granola bar, was more likely to be chosen (M =65.5% vs. M =34.2%; $z = 3.95$, $p < .0001$) and was perceived to be healthier (M=90.5% vs. 68.4%; $z = 3.48$, $p < .001$) when presented with the "Calories per gram" label than when only featured with the traditional nutrition information. Furthermore, we showed that the effect of the label on choice was mediated by healthiness perceptions associated to the products [LLCI: .11 to ULCI: .82].

Study 3 (N=274) showed that merely featuring the label can improve a manufacturer's choice share and healthiness perceptions. Specifically, in this design we compared two potato chips products that had the same nutritional information but that differed on how healthy participants perceived each brand to be: Cape Cod and Kettle. We showed that while Cape Cod was more likely to be chosen and was perceived as healthier when only calories and grams ($M_{Cape-Cod}$ =63.0% vs. M_{Kettle} =37.0%; $z = 3.54$, $p < .005$) or only calories were presented ($M_{Cape-Cod}$ =64.8% vs. M_{Kettle} =35.2%; $z = 4.00$, $p < .05$), this effect was neutralized in the presence of the label, as in these cases Kettle was perceived to be similar to Cape Cod in terms of choice share ($M_{Cape-Cod}$ =52.7% vs. M_{Kettle} =47.3%; $z = .74$, $p = .46$) and perceived healthiness ($M_{Cape-Cod}$ =54.9% vs. M_{Kettle} =45.1%; $z = 1.33$, $p = .18$).

While the initial studies showed the effect in a computer-based setting, study 4 (N=193) did this in a real context in which they chose between a bagel and a donut. Furthermore, this study confirmed our prediction that picking healthier items that have an absolute higher number of calories but a lower "Calories per gram" ratio due to the presence of the "Calories per gram" label leads consumers to ingest fewer calories in subsequent consumption opportunities. Specifically, we demonstrated that those that picked and consumed the bagel against the donut after being exposed to the label ate less granola trail mix when invited to consume such item freely (M_{Bagel} =17.76 vs. M_{Donut} =29.07; t (103) = 2.78, $p < .01$).

REFERENCES

Aydinoğlu, Nİlüfer Z., and Aradhna Krishna (2011), "Guiltless Gluttony: The Asymmetric Effect of Size Labels on Size Perceptions and Consumption," *Journal of Consumer Research,* 37 (6), 1095-112.

Balasubramanian, Siva K., and Catherine Cole (2002), "Consumers' Search and use of Nutrition Information: The Challenge and Promise of the Nutrition Labeling and Education Act," *Journal of Marketing,* 66 (3), 112-27.

Baumeister, Roy F. (2002), "Yielding to Temptation: Self-Control Failure, Impulsive Purchasing, and Consumer Behavior," *Journal of Consumer Research*, 28 (4), 670-6.

Baumeister, Roy F., Ellen Bratslavsky, Mark Muraven, and Dianne M. Tice. "Ego Depletion: Is the Active Self a Limited Resource?." *Journal of Personality and Social Psychology* 74, no. 5 (1998): 1252.

Baumeister, Roy F., Erin A. Sparks, Tyler F. Stillman, and Kathleen D. Vohs. "Free Will in Consumer Behavior: Self-control, Ego Depletion, and Choice." *Journal of Consumer Psychology* 18, no. 1 (2008): 4-13.

Biswas, Dipayan, Lauren Labrecque, Donald R. Lehmann, and Ereni Markos (2014), "Making Choices While Smelling, Tasting, and Listening: The Role of Sensory (Dis)similarity when Sequentially Sampling Products," *Journal of Marketing*, 78 (1), 112-26.

Carlson, Andrea, and Elizabeth Frazão (2012), "Are Healthy Foods really More Expensive? It Depends on How You Measure the Price," *(May 1, 2012).USDA-ERS Economic Information Bulletin,* (96).

Chandon, Pierre, and Nailya Ordabayeva (2009), "Supersize in One Dimension, Downsize in Three Dimensions: Effects of Spatial Dimensionality on Size Perceptions and Preferences." *Journal of Marketing Research* 46, (6): 739-753.

Edgeworthy, Judy and Hannah Waring (2006), "The Effects of Music Tempo and Loudness Level on Treadmill Exercise," *Ergonomics*, 49 (15), 1597-610.

Fitzsimons, Gavan J., Joseph C. Nunes, and Patti Williams (2007), "License to Sin: The Liberating Role of Reporting Expectations," *Journal of Consumer Research,* 34 (1), 22-31.

Gailliot, Matthew T., Roy F. Baumeister, C. Nathan DeWall, Jon K. Maner, E. Ashby Plant, Dianne M. Tice, Lauren E. Brewer, and Brandon J. Schmeichel. "Self-control Relies on Glucose as a Limited Energy Source: Willpower is More Than a Metaphor." *Journal of Personality and Social Psychology* 92, no. 2 (2007): 325.

Garlin, Francine V. and Katherine Owen (2006), "Setting the Tone with the Tune: A Meta-Analytic Review of the Effects of Background Music in Retail Settings," *Journal of Business Research*, 59 (6), 755-64.

Gibson, Edward Leigh (2006), "Emotional Influences on Food Choice: Sensory, Physiological and Psychological Pathways," *Physiology & Behavior*, 89 (1), 53-61.

Haws, Kelly L., and Karen P. Winterich (2013), "When Value Trumps Health in a Supersized World," *Journal of Marketing,* 77 (3), 48-64.

Herman, C. P., and Janet Polivy (1980), "Restrained Eating," *Obesity,*208-25.

Hofmann, Wilhelm, Wolfgang Rauch, and Bertram Gawronski. "And Deplete Us Not Into Temptation: Automatic Attitudes, Dietary Restraint, and Self-regulatory Resources as Determinants of Eating Behavior." *Journal of Experimental Social Psychology* 43, no. 3 (2007): 497-504.

Larson, Nicole I., Mary T. Story, and Melissa C. Nelson (2009), "Neighborhood Environments: Disparities in Access to Healthy Foods in the US," *American Journal of Preventive Medicine,* 36 (1), 74,81. e10.

Manzoni, Gian M., Francesco Pagnini, Alessandra Gorini, Alessandra Preziosa, Gianluca Castelnuovo, Enrico Molinari, and Giuseppe Riva (2009), "Can Relaxation Training Reduce Emotional Eating in Women with Obesity? An Exploratory Study with 3 Months of Follow-up," *Journal of the American Dietetic Association*, 109 (8), 1427-32.

Mohr, Gina S., Donald R. Lichtenstein, and Chris Janiszewski (2012), "The Effect of Marketer-Suggested Serving Size on Consumer Responses: The Unintended Consequences of Consumer Attention to Calorie Information,"*Journal of Marketing,* 76 (1), 59-75.

Muraven, Mark, Dianne M. Tice, and Roy F. Baumeister. "Self-control as a Limited Resource: Regulatory Depletion Patterns." *Journal of Personality and Social Psychology* 74, no. 3 (1998): 774.

Nilsson, Ulrica (2009), "Soothing Music can Increase Oxycotin Levels during Bed Rest after Open-Heart Surgery: A Randomized Control Trial," *Journal of Clinical Nursing*, 18, 2153-61.

Oliver, Georgina, Jane Wardle, Leigh Gibson (2000), "Stress and Food Choice: A Laboratory Study," *Psychosomatic Medicine*, 62, 853-65.

Raghunathan, Rajagopal, Rebecca W. Naylor, and Wayne D. Hoyer (2006), "The Unhealthy= Tasty Intuition and its Effects on Taste Inferences, Enjoyment, and Choice of Food Products," *Journal of Marketing,* 70 (4), 170-84.

Rehm, C. D., P. Monsivais, and A. Drewnowski (2011), "The Quality and Monetary Value of Diets Consumed by Adults in the United States," *The American Journal of Clinical Nutrition,* 94 (5), 1333-9.

Rolls, Barbara J., E. A. Bell, and B. A. Waugh (2000), "Increasing the Volume of a Food by Incorporating Air Affects Satiety in Men," *The American Journal of Clinical Nutrition,* 72 (2), 361-8.

Rolls, Barbara J., V. H. Castellanos, J. C. Halford, A. Kilara, D. Panyam, C. L. Pelkman, G. P. Smith, and M. L. Thorwart (1998), "Volume of Food Consumed Affects Satiety in Men," *The American Journal of Clinical Nutrition,* 67 (6), 1170-7.

Rolls, Barbara J., E. L. Morris, and L. S. Roe (2002), "Portion Size of Food Affects Energy Intake in Normal-Weight and Overweight Men and Women," *The American Journal of Clinical Nutrition,* 76 (6), 1207-13.

Rolls, Barbara J., Liane S. Roe, Tanja V. Kral, Jennifer S. Meengs, and Denise E. Wall (2004), "Increasing the Portion Size of a Packaged Snack Increases Energy Intake in Men and Women," *Appetite,* 42 (1), 63-9.

Romero, Marisabel and Dipayan Biswas (2016), "Healthy Left, Unhealthy Right: Can Displaying Healthy Items to the Left (versus Right) of Unhealthy Items Nudge Healthier Choices?" *Journal of Consumer Research*, June.

Tal, A., & Wansink, B. (2013). Fattening fasting: hungry grocery shoppers buy more calories, not more food. *JAMA internal medicine*, *173*(12), 1146-1148.

Vohs, Kathleen D., Roy F. Baumeister, Brandon J. Schmeichel, Jean M. Twenge, Noelle M. Nelson, and Dianne M. Tice. "Making choices impairs subsequent self-control: a limited-resource account of decision making, self-regulation, and active initiative." (2014): 19.

Vohs, Kathleen D., and Todd F. Heatherton. "Self-regulatory failure: A resource-depletion approach." *Psychological science* 11, no. 3 (2000): 249-54.

Wansink, Brian (2004), "Environmental Factors that Increase the Food Intake and Consumption Volume of Unknowing Consumers," *Annual Review Nutrition,* 24, 455-79.

Wansink, Brian, and Pierre Chandon (2006), "Can "low-Fat" Nutrition Labels Lead to Obesity?" *Journal of Marketing Research,* 43 (4), 605-17.

Wansink, Brian, Aner Tal, and Mitsuru Shimizu (2012), "First Foods Most: After 18-hour Fast, People Drawn to Starches First and Vegetables Last," *Archives of Internal Medicine,* 172 (12), 961-63.

Wilcox, Keith, Beth Vallen, Lauren Block, and Gavan J. Fitzsimons (2009), "Vicarious Goal Fulfillment: When the Mere Presence of a Healthy Option Leads to an Ironically Indulgent Decision," *Journal of Consumer Research,*36 (3), 380-93.

Witt, Catherine L. (2008), "Turn Down the Noise," *Advances in Neonatal Care*, 8 (3), 137-38.

Zatorre, Robert J. (2005), "Music, the Food of Neuroscience?" *Nature*, 434, 312-15.