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Proximity of snacks to beverages increases food consumption in the workplace: A field study

Ernest Baskin [a, *, 1], Margarita Gorlin [b, 1], Zoë Chance [b], Nathan Novemsky [b], Ravi Dhar [b], Kim Huskey [c], Michelle Hatzis [c]

[a] Department of Food Marketing, Erivan K. Haub School of Business, Saint Joseph's University, USA
[b] Department of Marketing, Yale School of Management, Yale University, USA
[c] Google, USA

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ABSTRACT

In an effort to bolster employee satisfaction, many employers provide free snacks at the office. Unfortunately, keeping employees happy can conflict with the goal of keeping them healthy, since increased snacking at work can contribute to overeating and obesity. Building on the growing body of research in choice architecture, we tested one factor that might influence snack consumption without impacting satisfaction: the relative distance between snacks and beverages. In a large field study at Google, we measured snack consumption when snacks were closer to or farther from beverages. We found that employees who used the beverage station closer to the snack station were more likely to take a snack—the likelihood of snacking increased from 12% to 23% for men and from 13% to 17% for women when the beverage station closest to the snack station was used. These results imply that employers and even families could reduce snack consumption easily, cheaply, and without backlash, by increasing the relative distance between beverages and snacks.

1. Introduction

Access to free snacks and beverages at work is an important factor in employee satisfaction. In a survey of over 1000 employees, those who were provided free food at work were 20% more likely to report being extremely or very happy with their jobs, compared to those working without free snacks. Another survey found that 60% of employees reported that having more food at the office would make them feel more valued and appreciated by their employer (Taber, 2014). It is no surprise, therefore, that offering free food at work is a growing trend among employers (Malcolm, 2015). Unfortunately, the proliferation of free food increases consumption and may be taking a toll on public health.

Widespread obesity in the United States and elsewhere has become a critical and costly public health problem (Hedley et al., 2004), and snacking is an important contributing factor. Snacking has become a "fourth meal," accounting for approximately a quarter of daily calories (Nielsen, Siega-Riz, & Popkin, 2002), and employees report that having free food available at work makes it difficult to keep their weight down (Taber, 2014). Thus, employers find themselves in a double-bind: offer free food that makes employees happy but unhealthy, or eliminate the food perks and risk employee backlash. Trying to simultaneously avoid both of these traps means offering snacks while somehow dissuading employees from eating too much of them. The question is, how?

Most workplace and public health efforts to encourage healthy eating rely on informational campaigns. However, information alone rarely changes how people eat. For example, although people believe calorie labeling influences what and how much they eat (Elbel, Kersh, Brescoll, & Dixon, 2009), most studies have found it does not (Liu, Roberto, Liu, & Brownell, 2012; Long, Tobias, Cradock, Batchelder, & Gortmaker, 2015; Swartz, Braxton, & Viera, 2011). Also, when the National Institute of Health spent hundreds of millions of dollars on the "5 a Day" campaign to increase fruit and vegetable consumption in the United States, it yielded no difference in the number of Americans eating five servings of fruits and vegetables a day, and overall fruit and vegetable consumption declined

* Corresponding author. Department of Food Marketing, Erivan K. Haub School of Business, Saint Joseph's University, 5600 City Avenue, Philadelphia, PA 19131, USA.
E-mail address: ebaskin@sju.edu (E. Baskin).
[1] These authors contributed equally to this work.

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slightly during the campaign (Casagrande, Wang, Anderson, & Gary, 2007). A similar "5 a Day" campaign in the United Kingdom produced similarly dismal results (Hope, 2010).

Fortunately, there are other promising and simple ways to encourage healthy choices: by changing the context in which choices are made. Since environmental cues can strongly impact food consumption (Wansink, 2014), employers might influence their employees' health by altering the design and layout of their snack areas. We conducted a large-scale field experiment investigating one way employers might subtly discourage snacking by modifying the environment. Having observed in an office break room that most employees entering the break room took a beverage, and being aware of previous research showing that accessibility of tempting foods increases their consumption (Cohen & Farley, 2008; Davis & Carpenter, 2009; Meyers & Stunkard, 1980; Painter, Wansink, & Hieggelke, 2002; Wansink, Painter, & Lee, 2006), we surmised that increasing the distance between beverages and snacks might reduce snack consumption, gently nudging employees toward healthier choices.

While prior research (Wansink, Painter, et al., 2006) has found the constant temptation of a candy jar on a secretary's desk led her to consume more candy than she did when the jar was placed across the room, constant temptations like the desktop candy jar are rare. More typically, temptations are brief and avoidable, not sitting within view and within arms reach, all day. Our research focused on the situation in which employees enter a break room for a beverage and are briefly tempted by the snacks. While common sense suggests that having tasty snacks close at hand will increase temptation and therefore consumption, it is also quite possible that once employees have already walked 100 feet or more to the break room, an additional few feet of relative distance may have no effect. Moreover, some surprising laboratory experiments have found that sometimes exposure to temptation can ironically improve self-control. Exposure to snacks has been found to make existing health goals salient, prompting people to override their temptations in a process called counteractive self-control (Fishbach, Friedman, & Kruglanski, 2003). This process can occur even before any temptation is sought (Trope & Fishbach, 2000). Since these surprising effects were reported in lab studies controlling for many other factors, we expected the real-world effects of counteractive self-control would likely be overwhelmed by the temptation of a proximal snack. We hypothesized that proximity to beverages would increase snack consumption.

While there is no study examining how relative proximity of food or temptations might interact with gender, some research does suggest that women and men might respond differently. Women tend to be more concerned with their physical appearance and more dissatisfied with their body weight and shape (Tiggemann & Rothblum, 1997). They also feel more conflicted about food (Rolls, Fedoroff, & Guthrie, 1991), have a stronger belief in the link between diet and health, and worry more about whether their diet is healthy (Rozin, Bauer, & Catanese, 2003). For women, negative feelings about their appearance result in more restrained eating (Tiggemann, 1994). In addition, women have higher levels of self-discipline than men in certain domains (Duckworth & Seligman, 2006; Tiggemann, 1994). For these reasons, we expected women would be more conscious of snacking decisions and less likely to respond impulsively to nearby snacks. As a result, we hypothesized women's snacking behavior would be less influenced than men's by proximity due to greater deliberation and less impulsive snacking.

We also expected snacking to increase throughout the day as employees' self-control resources became depleted. People find it increasingly difficult to resist temptation as decisions and other work tasks deplete their self-control reserves (Muraven & Baumeister, 2000). Even judges, who are generally trusted to make impartial and fair decisions, were found to exert less self-control in parole hearings the longer they had worked without a break (Danziger, Levav, & Avnaim-Pesso, 2011). We tested whether this depletion effect would interact with relative proximity to understand when relative proximity matters most.

Our study contributes to the growing behavioral science literature on "choice architecture," examining how contextual cues can guide healthy choices. Previous interventions have included moving bottled water to eye level (Thorndike, Riis, Sonnenberg, & Levy, 2014); putting healthy foods at the beginning of a buffet line (Wansink & Hanks, 2013); and switching to smaller bowls and utensils for serving ice cream (Wansink, Van Ittersum, & Painter, 2006). While no research has investigated the effect of the proximity of snacks to beverages, on a macro level, proximity to fast food restaurants has been found to correlate with higher obesity rates (Davis & Carpenter, 2009). Similarly, food salience in one's pantry at home has been shown to increase its consumption (Chandon & Wansink, 2002). To know whether relative proximity affects snacking in a typical work environment, a new study was needed.

We further understanding of how contextual cues impact food consumption in several important ways. First, we test whether the relative distance between snacks and beverages will reduce snacking. Our field experiment allows us to test distances relevant in the real world: not only to workplace kitchens, but also cafeterias, buffets, retail settings, college dining halls, and to home kitchen and eating areas. Second, we examine the effect of brief temptations rather than constant temptations like the candy dish. Third, we investigate how gender and time of day interact with proximity of snacks to beverages.

2. Materials and methods

We conducted a field study in the highest-traffic "micro-kitchen" in the Google New York office. A micro-kitchen is a break room containing hot and cold beverage stations and a variety of free snacks.

The micro-kitchen in which we ran this study had two entrances, and two identical beverage stations with refrigerators and coffee machines, one near (6′5″) and the other far (17′6″) from a snack bar displaying snacks such as M&Ms, chocolates, nuts, cookies, granola bars, packaged chips and pretzels, and fresh fruit (see Fig. 1 for a bird's-eye view of the micro-kitchen layout). Snack and beverage choices were recorded by research assistants unobtrusively working on laptops in the common areas next to the micro-kitchen. They recorded all beverage choices and recorded snack choice only if the employee's first action had been to take a beverage. 1170 beverage choices (67.6% by male employees) were observed over the course of seven full work days. For each of these observations, the following were recorded: relative proximity of the beverage station (near or far), whether a snack was taken, gender, and time of day. This micro-kitchen is frequented by approximately 400 employees and it was not feasible to track individuals, so some individuals likely appear more than once in our dataset. The design was quasi-random in that employees generally entered the micro-kitchen from whichever entrance (left or right) was closest to their office, or to the location from which they were coming.

3. Results and discussion

Results were analyzed using a binary logistic regression to determine the effects of proximity, gender, and time of day on employees' tendency to take snacks with their beverages. Time of