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How Visibility and Convenience Influence Candy Consumption^{*}

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How Visibility and Convenience Influence Candy Consumption

This paper addresses two questions: (1) How does the visibility and convenience of a hedonic food influence one's consumption, and (2) how do these factors influence one's estimate of how much he or she had consumed? Both questions have important implications for clinicians and for the nutritionally concerned. Answering the first question will show the extent to which two environmental factors (visibility and convenience) influence consumption. Answering the second will show the extent to which consumers overestimate or underestimate the influence of these factors. This is important in helping individuals monitor consumption patterns of which they may be unaware.

While taste,¹²³ stress, anxiety⁴, and motivation⁵ have all been shown to influence unintended consumption, the impact of food visibility and convenience have generated mixed results. Two studies comparing food storage habits in homes of obese and non-obese families found conflicting results--the first showed that food was more visible in the homes of obese families, but the second showed the opposite.⁶ Other studies have shown that convenient food can increase three fold, but that this occurs only when highly visible or salient in one's mind,⁷ or when it is initially offered.⁸ We do not understand whether factors like visibility and convenience have an impact that lasts beyond the first couple days of a study.⁹

One problem behind these inconclusive studies may deal with the utilitarian foods they examined -- fruits, canned soup, and vegetables. There is recent evidence¹⁰ that consumers relate to these utilitarian products in a more rational and calculating manner than they relate to hedonic products, such as chocolate, candy, ice cream, and cookies. What we do in this paper is

investigate how the visibility and the convenience of a hedonic product influences one's consumption of the product over a three week period. This addresses a topic that is relevant for dieters and for nutritionally conscious individuals. Do people eat more when a food is in sight, or when it is within reach?

METHODS

Subjects were 16 office workers in a university setting (10 female; median age 43 years) who agreed to be involved in a study related to candy consumption. The study was reviewed and approved by the Human Subjects Committee of the University, and it involved a three condition, between-subjects design with repeated measures. In the first week of the study, subjects were divided among three candy placement conditions. In each condition, the subjects were given a closed container holding 30 chocolate candy "kisses." In the first condition, the container was placed on top of the desk, where it was visible and convenient. In the second condition, the container was placed in the subject's desk drawer, where it was convenient but not visible. In the third condition, the container was visible but inconveniently placed on a shelf two meters away so that the subject was required to leave the desk to obtain the candy.

Each evening for three weeks, the containers were collected and replaced with new containers also containing 30 chocolate kisses. The number of chocolates consumed from each container was recorded daily. The replenished containers were kept in the same location for five consecutive days. On the 6th test day (Monday of the following week), the containers were rotated to a new placement condition for each subject. On the 11th test day, this was repeated. At the end of the three week (15 day) period, each subject was given a questionnaire which asked them to estimate their consumption of candy over the past three weeks in each of the three

conditions. Measures of attendance, nutrition consciousness, and dietary patterns were also taken.

While subjects had agreed to be part of the study, they had not been provided with details about the study. When the study began, subjects were told that the chocolates were part of the study, but that they were also a partial “thank you” for their involvement. Each Monday when the containers rotated locations, the administrator who most directly dealt with the staff member inconspicuously changed the location of the candy. Because there might be a learning effect that occurred if subjects noted the location change with suspicion, analyses were conducted between-subjects instead of within-subjects. Additionally, comparisons were made with data collected in the three conditions for the first week versus the same three conditions in the second and third week. The pattern of results were similar for each of the weeks, and therefore all data was used in the analysis.

In analyzing the data using SPSS software, a repeated measures, between-subject analysis of variance was conducted. The between-subject factor was the location of the candies and the five days in each location was treated as repeated measure within that condition. Covariates for gender, age, and weight were also included in the analyses.

RESULTS AND DISCUSSION

As noted in Table 1, the visibility and the convenience of the chocolates significantly contributed to how many were consumed. On an average day, subjects with candies *on* their desk consumed 2.9 more than those who had the container *in* their desk (8.6 vs. 5.7; $F_{2,50}=3.7$), and 5.6 more than those who had to walk two meters to reach them (8.6 vs. 3.0; $F_{2,50}=5.7$). With this operationalization, convenience contributed more to overeating than did visibility. That is,

having to walk two meters to reach the candies led subjects to eat 2.7 fewer chocolates each day than if they were conveniently located an arm's length away in one's desk (3.0 vs. 5.7;

$F_{2,50}=3.2$).

Table 1.
Actual and Estimated Amount of Candy Consumption

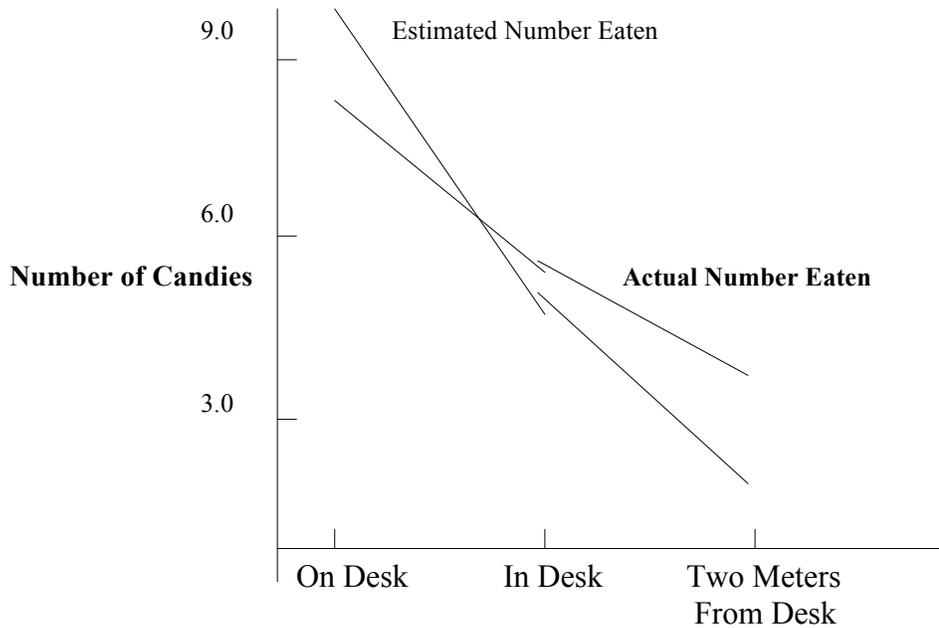
	Location of Candy			F-Test (F_{2,50})
	On Desk (Visible & Convenient)	In Desk (Non-visible & Convenient)	Two Meters from Desk (Visible & Inconvenient)	
Actual Number of Candies Consumed	8.6	5.7	3.0	6.4*
Estimated Number of Candies Consumed	9.7	4.7	1.1	17.3**
Difference Between Number of Candies Consumed and Estimate	-1.1	0.9	1.9	

* $p < 0.05$ ** $p < 0.01$

What was also interesting was how placement influenced perceptions of consumption. Recall that following the experiment, subjects had been asked to estimate how many candies they ate when the candy was in each of the three locations.* While the actual consumption of candies was 8.6, 5.7, and 3.0 for the on-desk, in-desk, and two-meters-from-desk conditions, the estimated consumption was 9.7, 4.7, and 1.1 respectively (see Figure 1). Consumers overestimated their consumption of candy that was on the desk, visible and convenient (9.7 vs. 8.6 actual). They underestimated the consumption of candy that was in their desk, non-visible and convenient (4.7 vs. 5.7 actual). Last, they more extremely underestimated the consumption of candy that was two meters from the desk in a visible but inconvenient location (1.1 vs. 3.0 actual).

* While there are memory concerns when one is retrospectively recalling their consumption of a product, subjects had been randomly assigned to their starting conditions. Therefore any bias in recall would be evenly distributed across each of the conditions. Furthermore, what we are interested in is less how these

Figure 1.
Differences In Actual and Estimated Candy Consumption



These results are interesting because they reflect assumptions we make about how the convenience and visibility of a food influences how much we consume. We appear to believe that if a food was convenient and visible, we probably consumed more of it than a food that was less visible, or one that was less convenient. Because our poor ability at consumption monitoring is one major contributor to overeating, this suggests that we need to compensate for how much we believe we consume by taking a food’s visibility and convenience in to account. A food that is inconvenient to consume – say a package of cookies in the cupboard versus a package on the counter – is also likely to be a food we over-consume relative to what we think.

APPLICATIONS

- We eat more of a food when it is “in sight *and* in reach.”

conditions vary between each other than we are interested in how their estimated consumption varies with

- While it must be underscored that a visible and convenient food will also be a food that one will tend to over-consume, a significant deterrent to over-consumption is convenience. If a product is out of sight, it is not always out of mind. However, if it is out of reach, we are less likely to overeat it.
- If visibility and convenience increase the consumption of chocolate, it may also work for healthy foods. What makes the cookie jar nutritionally dangerous, might bring the fruit bowl back in vogue.
- We underestimate – and over-consume – food that is inconvenient or less accessible. That is, we underestimate how many times we have gone to the refrigerator for ice cream or to the cupboard for cookies. This may be one of the factors that most unknowingly influences our over-consumption -- we underestimate our consumption of inconvenient foods.

their actual consumption.

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