

*HEALTHY FOOD PRODUCTS AT THE POINT OF PURCHASE:
AN IN-STORE EXPERIMENTAL ANALYSIS*

VALDIMAR SIGURDSSON

REYKJAVIK UNIVERSITY

AND

NILS MAGNE LARSEN AND DIDRIK GUNNARSSON

HARSTAD UNIVERSITY COLLEGE

The present study examined how product placement and in-store advertisement affect food selections of approximately 100,000 customers across 2 different stores using an alternating treatments design embedded in a multiple baseline design. Our results documented a substantial increase in the sales of healthy food products and a concurrent decrease in the sales of less healthy items via simple environmental modifications. These data suggest an effective means of altering unhealthy food choices at store checkouts.

Key words: healthy food choice, in-store experiments, stimulus control, motivating operations, consumer behavior

According to the World Health Organization (2003), obesity has reached epidemic proportions, and the risk of diseases such as diabetes, heart disease, hypertension, and other significant health problems has increased substantially (Noble, Stead, Jones, McDermott, & McVie, 2007). In recent decades, the prevalence of obesity has been linked to dramatic changes in lifestyle. Numerous interventions and governmental guidelines have therefore been undertaken to promote consumption of more healthy food products, but results have been inconsistent (e.g., Yeh et al., 2008). Factors that may alter the consumption of healthy food include the locations of healthy versus unhealthy food products within stores, availability of healthy food, access to nutrition information, and the price of food (Achabal, McIntyre, Bell,

& Tucker, 1987; Areni, Duhan, & Kiecker, 1999; Dubbert, Johnson, Schlundt, & Montague, 1984; Sigurdsson, Saevarsson, & Foxall, 2009; Sigurdsson, Larsen, & Gunnarsson, 2011a, 2011b; Winett et al., 1991; Yeh et al., 2008).

The limited behavior-analytic research on strategies such as shelf placement and promotion in stores and the impact of these strategies on the purchase of unhealthy and healthy food products suggests that in-store interventions are somewhat more effective in altering the purchase of unhealthy foods than healthy foods (e.g., Sigurdsson et al., 2009, 2011b). We decided to test this incongruence further while expanding the limited literature on the effects of increased stimulus saliency (shelf placement) and motivational operations on consumer behavior in the retail environment.

The purpose of the present study was to examine both the immediate and enduring sales effects of modifying the typical in-store shelf placement of food items at the checkout, with or without an in-store advertisement. Healthy items were substituted for unhealthy items (e.g., candy, high glycemic carbohydrates; HGC) at the

We thank the executives and store managers of Coop Norway for access to the retail outlets used as experimental setting during this study. This research was supported by means of Grant 090660043 from the Icelandic Center for Research awarded to Valdimar Sigurdsson.

Address correspondence to Valdimar Sigurdsson, Reykjavik University, Menntavegur 1, 101 Reykjavik, Iceland (e-mail: valdimars@ru.is).

doi: 10.1002/jaba.91

checkout lines in different types of stores. Dried fish and fruit mix were selected as the experimental healthy food products because they enjoy rather low sales figures where they are normally displayed in the retail store. We evaluated the effects of these interventions on the purchase of these healthy products, as well as the relocated unhealthy HGC products.

METHOD

Participants, Settings, and Materials

We manipulated placement of two healthy food products in one convenience store (A) and one discount store (B), both belonging to Coop Norway. The first product tested was a 30-g vacuum pack of dried fish (haddock). This product was tested in both stores. The second product was a 250-g pack of mixed dried fruit and nuts. This product was tested only in the convenience store. Sixteen products (confectionary pastilles and chewing gum) were removed from their usual shelf locations at the checkout during the interventions. Sales from 29,683 (Store A) and 72,685 (Store B) customer visits were examined during the duration of the study.

Response Definition and Measurement

The dependent variables were unit sales of dried fish, fruit mix, and the relocated unhealthy products in Store A and the dried fish in Store B. These were calculated separately for the two stores. The sales data were grouped into periods that consisted of 4 days of sales (i.e., Monday to Thursday and Friday to Tuesday [stores were closed Sundays]). Actual sales data were measured automatically by computer, which monitored sales of individual products as they were passed over a laser scanner and registered the universal product code for each product.

Design

We used an alternating treatments design embedded in a multiple baseline design across

stores. The price of the target products was kept constant for the duration of the study.

Conditions

Baseline and follow-up. No prompts or advertisements were provided to consumers. The target (healthy) products were placed in their normal locations, and other variables (e.g., price, promotion, and availability) were kept stable.

Checkout placement. We placed target products on the shelf at the checkouts in both stores. The product facings were identical for each shelf, with target products receiving the same amount of shelf space. The dried fish had seven product facings in the convenience store (seven packages; shelf front) and 10 product facings in the discount store. The fruit mix had four facings in the discount store. Availability was constant in each period of the experiment. When dried fish or fruit mix was placed on the shelves at the checkout, the HGC foods usually displayed were relocated to a shelf next to the checkout. The experimenter checked the retail stores on a daily basis, collecting photographic evidence of all relevant shelves to ascertain integrity with the study procedures.

Checkout placement and advertisement. We added an advertisement on the checkout shelves that was intended to function as an augmental rule for consumers' selection of the target products (see Fagerstrøm, Foxall, & Arntzen, 2011; Hayes, 1989). The advertisements in the discount store (297 mm by 210 mm; A4) and the convenience store (297 mm by 420 mm; A3) were placed on the checkout shelf. To capitalize on possible existing stimulus control, the advertisement for the dried fish presented a rule with a goal (i.e., an augmental verbal contingency; AVC) that was intended to establish the target product as reinforcing. It read, "Dried fish is good for your health, builds up your muscles and helps to keep you in shape." The content was based on the results of consumer focus groups and surveys that were conducted prior to the study.

RESULTS AND DISCUSSION

The average number of customers who visited Store A per period during each condition of the experiment was 1,918, 2,015, and 2,129 for (a) baseline and follow-up, (b) checkout-only placement, and (c) checkout plus advertisement conditions, respectively. The average number of customers who visited Store B per period was 4,377, 4,082, and 4,168 for the same conditions, respectively. As shown in Figure 1, sales of the target products increased relative to baseline when they were placed at the checkout and when AVCs were in place. However, sales of dried fish or fruits were not substantially different when the checkout location was modified alone or combined with the AVC. Furthermore, these changes were not maintained when the products were located in their original positions during follow-up. As shown in Figure 1 (bottom), the sales of the relocated HGC checkout products in Store A decreased relative to the initial baseline when the interventions were introduced and then remained fairly stable throughout the remainder of the study. On average, sales of these items were 29% lower during the follow-up period than in the initial baseline. However, sales of these products were similar across all conditions during the alternating treatments comparison, perhaps because these products had been displayed at the checkout for a long time and consumers already had an established reinforcement history for purchasing them. These results suggest that relocation of these items had a gradual impact on sales, but other extraneous variables also might have been responsible for the decrease. Further research is needed because functional control for the relocated products was not demonstrated.

Results suggest that placing healthy food items at the store checkout (prominent discriminative stimuli) can lead to a substantial impact on sales of these products. Adding an advertisement at the point of purchase did not lead to a meaningful increase in sales beyond that obtained from the product relocation alone. Further investigation is

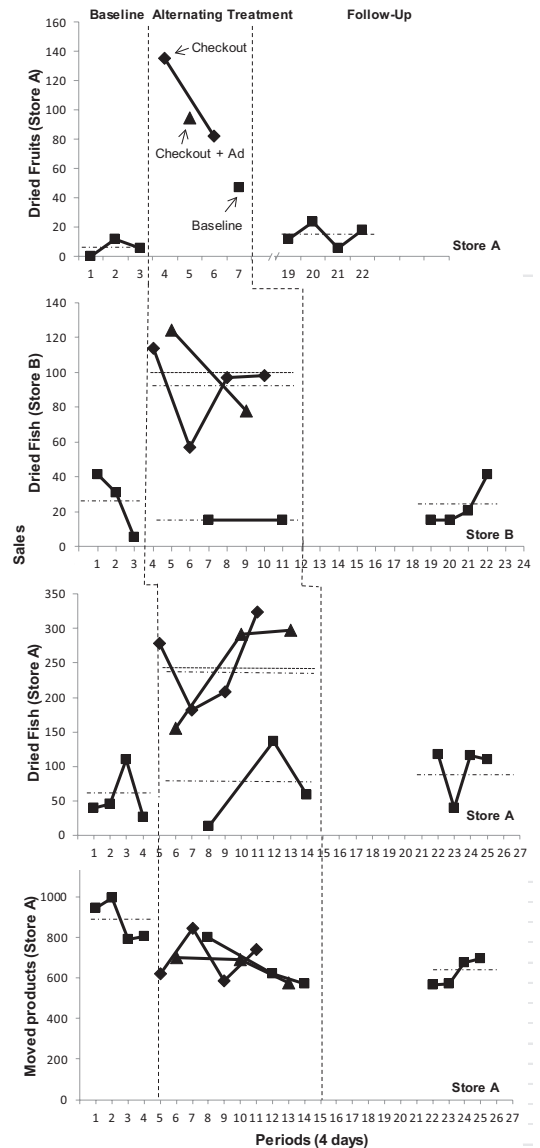


Figure 1. Sales of dried fruits (fruit mix) in the discount store (Store A, top panel). Sales of dried fish in the convenience store (Store B, second panel) and Store A (third panel). Sales of the relocated chewing gum and pastilles in Store A (bottom panel). Lines show averages for each condition. Periods contain 4 experimental days.

needed with a variety of healthy food products and product variations (e.g., pack sizes). The initial low baseline purchase of the target products, along with their small package sizes,

might explain part of the success of this manipulation. Dried fish and fruit mixes as target products seem to enjoy greater increases in sales than more popular healthy food products (e.g., bananas and cherry tomatoes) that were tested in previous in-store experiments (Sigurdsson *et al.*, 2011a, 2011b). An examination of the broader sales statistics from our experimental stores shows that bananas are the most sold item in the fruit and vegetables category, purchased by about 25% to 30% of consumers. Thus, it is likely that bananas were already placed in the shopping basket of many customers long before they approached the checkout zone of the store. On the other hand, the same broad sales statistics from the experimental stores show that dried fish and fruit mix, which usually are not located in prominent store placements, have a more untapped potential and could, through in-store marketing, become a more frequent preferred alternative to unhealthy snacks (e.g., potato chips and sweets). Additional modification could be made in follow-up studies in which the behavior of single customers is tracked using shopping cards or voluntary participation in evaluations of longitudinal buying habits.

REFERENCES

- Achabal, D. D., McIntyre, S. H., Bell, C. H., & Tucker, N. (1987). The effect of nutrition P-O-P signs on consumer attitudes and behavior. *Journal of Retailing*, *63*, 9–24.
- Areni, C. S., Duhan, D. F., & Kiecker, P. (1999). Point-of-purchase displays, product organization, and brand purchase likelihoods. *Journal of the Academy of Marketing Science*, *27*, 428–441. doi: 10.1177/0092070399274003
- Dubbert, P. M., Johnson, W. G., Schlundt, D. G., & Montague, N. W. (1984). The influence of caloric information on cafeteria food choices. *Journal of Applied Behavior Analysis*, *17*, 85–92. doi: 10.1901/jaba.1984.17-85
- Fagerström, A., Foxall, G. R., & Arntzen, E. (2010). Implications of motivating operations for the functional analysis of consumer choice. *Journal of Organizational Behavior Management*, *30*, 110–126. doi: 10.1080/01608061003756331
- Hayes, S. C. (Ed.). (1989). *Rule-governed behavior: Cognition, contingencies, and instructional control*. New York, NY: Plenum.
- Noble, G., Stead, M., Jones, S., McDermott, L., & McVie, D. (2007). The paradoxical food buying behaviour of parents. *British Food Journal*, *109*, 387–398. doi: 10.1108/0070700710746795
- Sigurdsson, V., Larsen, N. M., & Gunnarsson, D. (2011a). The behavioural economics of neutral and upward sloping demand curves in retailing. *The Service Industries Journal*, *31*, 2543–2558. doi: 10.1080/02642069.2011.531127
- Sigurdsson, V., Larsen, N. M., & Gunnarsson, D. (2011b). An in-store experimental analysis of consumers' selection of fruits and vegetables. *The Service Industries Journal*, *31*, 2587–2602. doi: 10.1080/02642069.2011.531126
- Sigurdsson, V., Saevarsson, H., & Foxall, G. (2009). Brand placement and consumer choice: An in-store experiment. *Journal of Applied Behavior Analysis*, *42*, 741–745. doi: 10.1901/jaba.2009.42-741
- Winett, R. A., Geller, E. S., Mundy, L. L., Moore, J. F., Wagner, J. L., Hite, L. A., ... Lombard, D. (1991). Altering shoppers' supermarket purchases to fit nutritional guidelines: An interactive information system. *Journal of Applied Behavior Analysis*, *24*, 95–105. doi: 10.1901/jaba.1991.24-95
- World Health Organization. (2003). *Obesity and overweight*. Retrieved from <http://www.who.int/dietphysicalactivity/media/en/gsf Obesity.pdf>
- Yeh, M. C., Ickes, S. B., Lowenstein, L. M., Shuval, K., Ammerman, A. S., Farris, R., & Katz, D. L. (2008). Understanding barriers and facilitators of fruit and vegetable consumption among a diverse multi-ethnic population in the USA. *Health Promotion International*, *23*, 42–51. doi: 10.1093/heapro/dam044

Received August 1, 2012
Final acceptance May 2, 2013
Action Editor, Mark Dixon

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.