

Review of the Literature on Use of Behavioral Economic Nudges in Farmers' Markets and More Traditional Retail Settings

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Purpose: BECR facilitates new and innovative research on the application of behavioral economics theory to healthy food choice behaviors that would contribute to enhancing the nutrition, food security, and health of American consumers.

BECR devotes a substantial portion of its efforts to factors that would facilitate healthy and cost-effective food choices by participants in the Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).

Vision: To use behavioral economics principles and triple win strategies to promote healthy, economical food choices among WIC and SNAP recipients and the general public through research, capacity building, and dissemination.

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Abstract

Behavioral Economic nudges offer a range of techniques for influencing food-choice related behaviors in retail settings, including convenience stores, grocery stores and farmers' markets. Below we summarize the research to date that has used behavioral economic techniques to nudge consumers to make healthier choices in places where we shop for food.

Introduction

Have you ever found yourself looking at your PSNC energy bill and comparing your energy use to the other house depictions that represent consumption of an average home and an energy efficient home? Did it leave you thinking about ways to reduce your own consumption to match the others? The field of Behavioral Economics is used to understand the complexity of choice for an individual, incorporating cognitive, social normative and choice architectural techniques to influence choice, even if the choice was not initially deliberate (Thaler & Sunstein, 2009; Heath & Heath, 2010).

Behavioral Economic nudges offer a range of techniques for influencing food-choice related behaviors in retail settings, including convenience stores, grocery stores and farmers' markets. Adaptations have been seen in physical environment, making a space more appealing, creating a healthier default option through convenience and incorporating normative beliefs to a normally solitary behavior (Just & Payne, 2009).

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Below we summarize the research to date that has used behavioral economic techniques to nudge consumers to make healthier choices in places where we shop for food. Techniques incorporate appealing design, novel technology, convenient placement and normative beliefs to increase healthier food and beverage choices. The research below provides a resource of successful interventions that can be replicated in a variety of retail settings.

Findings

Traditional Retail Settings

Behavioral Economic behavior change techniques have been growing in popularity among traditional food retail outlets, such as supermarkets, small grocery stores, and corner stores. Researchers have attempted multiple interventions in this setting producing a variety of results, some successful and some not. Below is a review of some of the interventions that offer tangible, replicable and innovative approaches to nudge consumers towards healthier food choice behaviors in stores.

Brian Wansink's (2015) article, "Change their Choice! Changing Behavior Using the CAN approach and Activism Research" provides a framework of techniques used in multiple interventions. This framework explains that successful interventions focus on techniques that make food more "convenient (physically or cognitively), attractive (comparatively or absolutely) and more normal (perceived or actual)." Interventions related to convenience often highlight the offering of pre-cut fruit, such as apple slices, due to the inconvenience or inability to bite directly from the apple reported by some adults and children. Although the study focused on **pre-cut fruit offered** in cafeterias for children, results showing a significant **70% increase of children choosing fruit** has implications for increasing sales of fruit in convenient stores, where individuals are looking for a snack that is quick and easy to consume in a car (Wansink, Just, Hanks, & Smith, 2013).

Another example can be found in, "*Using a computational model to quantify the potential impact of changing the placement of healthy beverages in stores as an intervention to 'nudge' adolescent behavior choice*" where authors looked strategically at the placement of sugar sweetened beverages (SSB) in coolers in convenience stores to nudge adolescent to choose the healthier drink choice (Wong et al., 2015). Understanding this component of convenience, authors recognized the vertical and horizontal effect that is oftentimes seen in placement of a similar grouping of items (like beverages in coolers at convenience stores). The authors describe the horizontal effect as the distance traveled from the entrance to the coolers and the vertical effect references the placement of the item from bottom shelf to the top shelf. The authors hypothesize that convenience shoppers, with no specific preference for a SSB, will walk to the closest cooler and choose what can be found at eye level. In the study, authors created a decision-analytic model based on data from a community-based survey in Baltimore and findings from market literature. They used this data to simulate

1,000 situations based on adolescent choice behaviors, which were categorized into groups based on existing SSB choices, *always, usually, sometimes, rarely/never*. The model looked at the probability of selecting non-SSB when SSB were strategically placed in coolers furthest from the door, as well as lower shelves, while healthier beverage options were placed in the first cooler at a more convenient vertical level (complete map of the cooler strategy model can be found in the Appendix). **Authors found the largest effect on individuals categorized as “sometimes” SSB drinkers, which were 4.9 times more likely to purchase non-SSB when it was placed in cooler 1, and at eye level.** In general, non-SSB were 2.5 times more likely to be chosen when positioned in the first cooler compared to other coolers (2 thru 6), and 2.8 times more likely to be chosen when placed on an eye-level shelf in cooler one than the bottom shelf in cooler six (the furthest cooler from the entrance). The model showed no significant impact on individuals that were categorized as “always” SSB drinkers, which shows how convenient placement of non-SSB can nudge healthier choice behaviors of individuals who are not yet frequent consumers of sugar sweetened beverages.

An additional study looked at convenience and middle-choice preference placement of snack bars to show additional support for rearrangement of similar snack product aisles to nudge customers for healthier options. *Nudging Product Choice: the effect of position change on snack bar choice* looked at changes in placement of three types of granola bars, apple, apple-chocolate and coco-chocolate, each a different calorie level and the likelihood of the healthier option being chosen when it was placed in the middle of the other options (Keller, Markert, & Bucher, 2015). The study looked at 120 college students, equal distribution of male and females, who completed a questionnaire on an unrelated topic and were told they would receive a granola bar as a reward. Two conditions were used, one where the snacks were positioned in ascending caloric level, apple, apple-chocolate and coco-chocolate, and the other where the lowest calorie bar was placed in the middle, apple-chocolate, apple and coco-chocolate. **When the apple bar was placed on the left, it was only chosen 8/60 times, or 13.3%, however when it was placed in the middle, it was chosen 22 out of 60 times, 36.7%.** A Chi-squared test showed a significant effect on selection $\chi^2_{(2)} = 14.953, p = .001$. Further analysis to ensure the significance was not due to difference in choice of coco-chocolate bar (which did not move in the two conditions) assessed the probability of choosing the apple bar versus not choosing the apple bar, and still showed the position effect was significant $\chi^2_{(1)} = 8.71, p = 0.003$.

The previously described studies present options for easily replicable positioning of snack products when surrounded by similar products that easily nudge consumers to healthier options based on lower calorie or lower sugar content. Building upon Wansink’s framework, influencing behavior choice through normative beliefs has shown to be quick and more productive for changing consumer behavior (Wansink, 2015). The following studies look at specific methods of increasing behavior change through normative beliefs in supermarkets.

Partitioned Shopping Carts: Assortment allocation cues that increase fruit and vegetable purchases demonstrates an inexpensive, relatively easy-to-implement technique that serves as a reminder of how much of your food purchases should be represented by fruits and vegetables (F&V) and suggests a social norm of what to purchase (Wansink, 2011). Wansink and colleagues (2011), look at two different approaches with one focusing on the partition increasing F&V purchases and the other focusing on larger partitions leading to increased spending. The first study divides a traditional shopping cart in half (front vs. back) separating the two halves with a 2.5-meter strip of yellow duct tape that is found on the base of the cart, as well as wraps around the top, leaving the interior of the cart clear for groceries. A flyer was created and positioned in the interior of the front of the cart, in clear view for the customer pushing the cart. The top of the sign read, “*In the front of your cart ... please put only healthy foods such as fruits, vegetables, dairy, meat.*” The bottom of the sign read, “*In the back of your cart ... please put everything else such as chips, detergent, soft drinks and breakfast cereal.*” Customers were approached as they entered the store and asked to participate; a follow-up survey was completed after they finished shopping with questions regarding their consideration for purchasing more F&V than they typically do, and if they did purchase more F&V than normal. Surveys were also conducted with customers using normal carts for comparison purposes. Receipts from customers who used the partitioned cart and receipts from customers who did not were gathered and money spent on F&V was compared. **Customers with partitioned carts bought more fruit (\$3.65 vs. \$1.82; $F(1, 144) = 8.76, p < .01$) and vegetables (\$5.19 vs. \$2.17; $F(1,144) = 12.61, p < .01$) than customers who shopped with a normal cart.** Additionally, surveys showed that participants with partitioned carts considered and believed they bought more F&V than they typically did; only their belief of purchasing more was found significant, for fruit (3.50 vs. 2.11; $F(1, 165) = 22.02, p < .001$) and for vegetables, (3.30 vs. 2.27; $F(1, 163) = 10.80, p < .01$). Further analysis of survey results showed that dollars spent on F&V did not differ based on shopper knowledge, nor on size of families. **The aggregate percent of increase for F&V purchased when using the partitioned cart was 121.6% or up from \$3.99 to \$8.84.**

Building upon results from the initial study regarding spending on F&V, Wansink and colleagues (2011) looked to see if a larger size of partition led to increased spending with secondary findings related to a promotional flyer in the cart based on either health or price marketing techniques. The study was conducted with 169 shoppers in an independently owned and operated grocery store in a large North American city. The cart intervention was a paper mat at the bottom of the cart that read Fruits and Vegetables on one side and Meats and Treats on the other. The size of these partitioned sections were 35-65 (35% for F&V) for one group and 50-50 in another group, with a third group with no mat for a control. Additionally, each cart had the promotional flyer with one of the two positions; the health position read, “*Healthy food at great values. Research shows that eating more fruits & veggies and less meats & treats is good for health! Healthy food. Great values,*” while the cost

position read, *“Superior food at great values. Research shows that purchasing high-quality food reduces spoilage and is overall more cost effective! Super food. Great prices!”* Research assistants targeted shoppers who were doing their weekly shopping and intending to use a grocery cart; they were randomly assigned to each cart by selecting the next one available, which had been positioned in random order. After each participant completed shopping, receipts were collected and research assistants quickly ascertained if the shopper had viewed the flyer in the cart (all shoppers reported yes). Specifically, the following figures on the receipts were used, total pre-tax amount spent on F&V, total amount spent as a whole and the proportion of F&V spending out of all spending. As the authors expected, there was a significant increase in spending on F&V compared to the control cart (\$10.36), with the 35% F&V cart averaging \$11.85 and the 50% F&V cart with an average of \$13.40, $F(2, 163) = 10.15, p < 0.01$. Furthermore, **the health flyer was found to influence spending more than the cost-savings flyer, with \$14.42 versus \$9.18** (respectively), $F(1, 163) = 72.66, p < 0.01$. Difference among groups in dollars spent on F&V within the cart intervention was not significant when the cart included the cost-analysis flyer, representing a clear impact of the health directed message on shoppers.

In another study focusing on an innovative use of technology to demonstrate social norms with a shopping cart intervention, authors Vaiva Kalnikaite et al. (2011) consider the incorporation of social norms around local and organic food purchases in *“How to nudge in situ: designing lambent devices to deliver salient information in supermarkets”*. Specifically, authors sought to understand the effect that an electronic device offering information about origin and organic status for scanned food products had on local and organic food purchasing behaviors. Food items could be scanned with the device and would give quick, simple feedback on distance of origin from the store, as well as if it was designated organic or not. If the item was organic, then colored dots would display green, while non-organic products would display as orange. The further the food item originated from the store, the greater number of 16 dots would light up. The device allowed consumers to compare products to make a quick decision. If the item was not selected by the consumer, they could hit “cancel,” whereas putting it in the cart, the information was gathered for their shopping experience. As the shopper continues throughout the store, an emoticon indicator would demonstrate where the individual’s average mileage of food compared to other cart users, by expressing either a happy, neutral or sad face, with the sad face representing going over the average amount of food miles of a nearby shopper.

A semi-controlled within-subjects study with eighteen participants was conducted. Each of the 18 participants was given two shopping scenarios that included lists of items varying from sources and organic choices. Each participant shopped with the new device and without it after completing an initial 20-item questionnaire about food choice. The findings showed that customers used the device to compare multiple products when they were unable to tell where the product came from or its organic status based solely on the label. An initial binomial test was conducted for 16 products on the scenario grocery lists

provided finding that **when customers used the lambent device to compare products, they chose more local products with overall lower mean mileage for 13 of the items (p=0.05)**. Upon closer look at each of the items, the nudge had a larger effect on mean food miles traveled when the origin could not be determined from the label easily, so if the print was small or if it was written in an unobvious place. Organic status of the food did not have a significant impact on any purchasing behaviors, whereas the social norms aspect was not well received. Customers reported that they did not like the norm feedback because oftentimes they could not find a product that was of local origin and the face made them feel bad. The authors comment that, *“what is key in nudging shopping decisions is balancing information frugality and simplicity with enough feedback to enable people to change their choices in a way that they find rewarding and motivating.”*

Creative, yet not significant

Influencing shopper behavior can be challenging, with researchers attempting to create innovative techniques that are inexpensive, easily replicable and effective. Two additional studies tested techniques that while innovative, did not produce significant results.

A quick reference guide to the nutritional content of food has often been sought to nudge individuals to choosing healthier food options. Authors Gary Sacks, Mike Rayner, and Boyd Swinburn (2009), look at the impact that “traffic-light” nutrition labeling has on healthier food purchases in the article, *Impact of front-of-pack ‘traffic-light’ nutrition labeling on consumer food purchases in the UK.* The traffic-light nutrition labels were introduced on a total of 23 food products in one store at various periods throughout 2007. Food products of healthier choice were colored green, with descending health value to amber and then red. The authors chose to analyze purchases four weeks prior and four weeks after the introduction of labels on two specific food products, chilled “ready meals” and fresh-packaged sandwiches. These items were chosen for their quantity to increase statistical power, as well as vary nutritional content. The authors took into account various potentially confounding effects, such as discounts on items, and weekly differences in sales due to seasonality, etc. When looking at each item separately, **there was no association between the healthiness of the pre-made meals product and sales, Spearman’s rank correlation=0.21, p = 0.69, with slightly better results for the analysis of sandwich sales based on healthiness, Spearman’s rank correlation = -0.47, p=0.12**. Authors reported potential of customers not understanding the new traffic-light labels, indicating that a combination of education and labels may be required for the intervention to be more effective.

Brian Wansink and Aner Tal (2015) focus more on a priming strategy in, *“An apple a day brings more apples your way: healthy samples prime healthier choices”* with the hypothesis that sampling of food items can be used to supplement advertising claims and promote food product choice. Food sampling is found frequently in both traditional retail settings, as well as Farmers’ Market settings. With many food purchases in-store being unplanned

purchases, the authors believe that sampling of healthy food items can provide a nudge for healthier food choices for additional unplanned spending. One hundred and twenty participants were recruited and randomly divided into three conditions, receiving either a sample of apple, cookie or no sample for control. Participants were offered a sample off of a tray upon entering the store, with all respondents (even those selected, but given no sample) asked about the number of F&V purchased during their shopping. To analyze volume of F&V products purchased, each item counted as one unit, so that a bunch of bananas would count as 4-5, instead of just one item. **While individuals offered an ample sample did purchase greater amounts of F&V (Mean=2.78, SD=2.15) than those offered a cookie (M=2.17, SD = 2.26) and offered no sample (M=2.22, SD=2.15), the p-value showed only marginal significance with p =0.06.** Implications of this study provide some evidence for its replication in a Farmers' Market setting to see the impact it may have in a non-traditional retail setting.

Farmers' Markets

Results were limited when searching for specific behavioral economic or nudge interventions within farmers' market settings. However, the few results did offer interesting insight into this less traditional setting for this approach.

Jason Gilliland and colleagues (2015) report findings from their study, "*Using a smartphone application to promote healthy dietary behaviors and local food consumption,*" focusing on innovative utilization of technology in a Smartphone app called "SmartAPPetite" to overcome behavioral and economic barriers and nudge consumers to increase consumption of local, healthy foods. The authors note that education is not sufficient when changing behavior and so it must be combined with behavioral cues, focusing on multiple levels of tips and recipes for healthy eating, in addition to local vendor spotlights and coupons to nudge participants to seek local, healthy food options. Specifically, the study took place at two farmers' markets in London, Ontario, Canada. Patrons of the markets were recruited, with a total of 208 participants (representing about a 10% sample population of total market visitors). A baseline food survey was completed to understand food values for each participant, taking into account any dietary restrictions or food-related goals to further tailor their experience with the application. Additionally, it served as a baseline for food related purchasing decisions. There was a mid-point survey to check on satisfaction and an outcome evaluation upon completion to measure the effect on food purchasing and behavior changes related to healthy, local food. The intervention lasted between 8 to 10 weeks for each participant, during which they received 2-3 daily messages regarding tips and recipes for healthy eating and information about local market vendors. Furthermore, participants could "check-in" while at the market to gather additional coupons. During the participant's use of the app, unique URLs for each participant tracked the frequency and duration of page views and other factors that informed actual usage rates of each participant. Throughout the intervention, two-thirds of participants used the app to "check in" to the farmers' market, and interaction with the app was most popular on

Saturdays, which was the day the market was held. **The authors reported an association between greater use of the application and increased healthy food purchases and consumption of healthy food items, and decreased consumption of unhealthier items.** Significant Pearson's R correlations (2-tailed, 0.05 level or less) were found between active use of the app and increased consumption of vegetables and homemade meals, with decreased consumption of fruit juices, soft drinks, diet soft drinks, and sugary foods (Gilliland et al., 2015).

Further support for techniques to nudge consumers to purchase local foods at Farmers' markets can be found in "*Examining the influence of price and accessibility on willingness to shop at farmers' markets among low-income eastern North Carolina women*" (McGuirt et al., 2014). Although not specifically an intervention guided by behavioral economics, findings from price scenarios ran with 37 low-income women in eastern North Carolina provide support for future marketing approaches to encourage fruit and vegetable (F&V) purchase. Specifically, scenarios were presented to the women based on two different stimuli, with messaging from one focusing on discounted price and the other on increased produce quantity. In the discounted price scenario, the dollar values would be presented showing that the same quantity of food that could be purchased given the discount at the farmer's market, \$6.40 at the farmers' market rather than \$8.00 at the grocery store. The second stimulus focused on the difference in amount of produce a consumer could receive at the farmers' market for the same price as the store, with an image that showed that you could purchase 15 vegetables at the farmers' market for the same it would cost you to buy 8 vegetables at the grocery store. **Overall, consumer's willingness to shop at the farmer's market increased as the discount price raised from 5% to 20%, suggesting the importance of price for driving purchasing behavior.** However, the majority of consumers were more motivated to shop at farmer's market by the visual depiction of greater amount of produce for the same cost than the sole financial depiction. The authors suggest that principles of behavioral economics can help explain this preference for the image representation as an understanding of greater value, a value that is easier to understand when comparing an image that shows quantity rather than dollar amount.

Conclusion and implications

The studies summarized above offer valuable insight into behavioral economic techniques that can nudge behavior change through the framework of convenience, appeal and normative beliefs, choice architecture, and providing salient information in easy-to-understand formats. Results vary across intervention techniques with some seeming less complex and lower effectiveness.

All reflect limitations in the sense that only proximal outcomes are assessed, with none of the studies looking at sustained behavior change after interventions. Through reviews of each article, it is clear that behavioral economics nudge theory offers a solution to

encouraging healthier options for unplanned purchases in stores, as well as providing a cue to increase F&V purchase, although the purchasing results may not translate to consumption behaviors. It is recommended that a future approach be to combine in-store nudge techniques with education-based theoretical models for behavior change to increase both purchase, consumption and create sustainable, individual change.

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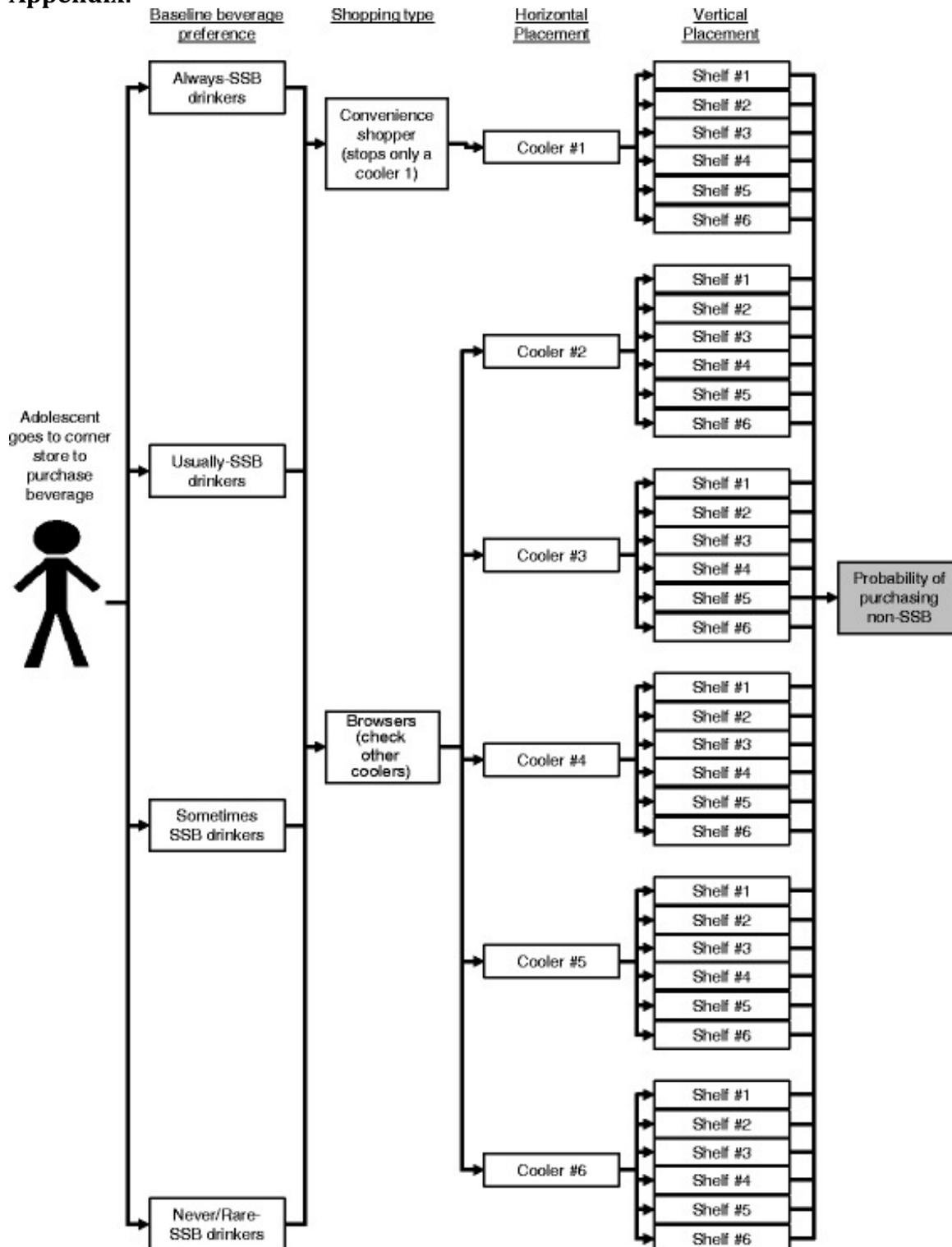
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