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Field experiments on food choice in grocery stores: A ‘how-to’ guide

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ABSTRACT

Food choice is an important area of study, as habitual consumption of high sugar, high fat, and low nutrient foods has been shown to contribute to obesity and related chronic conditions. Grocery stores and supermarkets play a particularly important role in food choice, since they account for almost half of all retail food sales. We propose that conducting field experiments in grocery stores is an attractive methodology for learning about food purchasing behaviors and identifying policy levers that may be successful in shaping those behaviors. We summarize the challenges and barriers that researchers may face while carrying out field experiments in a retail grocery environment, and provide a simple ‘how-to’ guide that researchers can use to replicate field experiment best practices in this setting.

1. Introduction

The average U.S. household makes at least one grocery store shopping trip per week, spending on average \$30 per visit (FMI, 2015). Sales attributed to grocery store purchasing venues accounted for approximately 42% of all retail food purchases in 2015 (U.S. Census Bureau, 2016) and 63–70% of dietary energy in the US diet was purchased in retail stores (Drewnowski and Rehm, 2013). Given the important role that grocery stores play in household food provisions, exploring in-store shopping behavior could help find ways to combat poor food choices at the point of purchase. Food choices are an important area of study as habitual consumption of high sugar, high fat, and low nutrient foods have been shown to contribute to obesity and related chronic conditions such as high blood pressure, diabetes, cardiovascular disease, and certain cancers (Hurt et al., 2010; NIH, 2012).¹ For instance, 24-h food recalls show that sugar-laden store-bought soda is a top contributor of energy intake of adolescents and adults ages 20–50 years old (accounting for over 4% of energy intake) (Drewnowski and Rehm, 2013).

An understanding of food choice behaviors and the potential effectiveness of in-store health promotions could be gained by studying consumer shopping behavior in a retail grocery store environment. For example, most Americans consume fewer than the recommended

amounts of fruits and vegetables (Center for Disease Control, 2013), despite increased produce consumption being linked to combating obesity (Epstein et al., 2001; He et al., 2004) and reducing the risk of cardiovascular disease (Hung et al., 2004; He et al., 2006, 2007). In-store interventions targeted at increasing produce purchases may be a way to impact a large population’s food habits, thereby ending the cycle of poor eating habits that are detrimental to health.

As described by List (2011), field experimentation is a useful methodology for studying human behavior in a wide range of contexts. Researchers have successfully conducted field experiments in partnerships with governments, firms, nonprofit organizations, and schools. Broadly defined, a field experiment is any study of human behavior carried out with some or all components of the subjects’ natural setting (Harrison and List, 2004). Field experiments take on many forms, including the ‘artefactual field experiment’ – which List (2011) notes as being similar to a standard laboratory experiment, but different in that it uses participants from the ‘market of interest’; the ‘framed field experiment’ – in which participants are in their natural environment rather than in a laboratory; and the ‘natural field experiment’ – in which subjects are naturally undertaking tasks and are not aware that they are participants in an experiment (Harrison and List, 2004).

All types of field experiments show promise in the grocery store setting. Researchers may recruit shoppers directly in a retail setting to

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E-mail address: kcarroll3@wisc.edu (K.A. Carroll).¹ Obesity continues to be a major concern in the U.S., with the Center for Disease Control (CDC) estimating that at least 68% of U.S. adults aged 20 and older are overweight with BMIs of 25+. Of this 68%, approximately 41% are obese with BMIs of 30+ (Ogden et al., 2010). However, according to Shah and Braverman (2012), estimates reliant on BMI calculations alone may in fact be underestimating the widespread prevalence of obesity.

participate in artefactual or framed field experiments. Examples of such experiments include eliciting consumer preferences for various foods across a variety of experimenter-generated in-store shopping scenarios. Researchers may also use a natural field experiment approach, and work directly with a grocery store to change aspects of the environment without the shoppers' knowledge. Experiments using this approach could provide opportunities to directly record shopper behavior, typically using scanner data.

Field experiments allow researchers to change specific environmental factors to draw a causal link between these changes and changes in shopping decisions. This is different from analysis of secondary scanner data, which usually only provides insights about correlational factors that are related to purchasing behavior. Identifying the causal factors that shape food purchasing behavior is of key importance to policy makers and practitioners, who can use such information to implement interventions that will shift consumer food choices towards more healthful items.

Field experiments in grocery store settings have emerged as an attractive way to evaluate the effectiveness of interventions related to food choice. Some of the earliest field experiments date back to the early 1980s as the Food and Drug Administration (FDA) conducted experiments with grocery store chains on the most effective format for the Nutrition Facts Panel that is now on modern food labels due to the Nutrition Labeling and Education Act (NLEA). These included experiments in partnership with grocery store chains on nutrition shelf labeling (Levy et al., 1985) and health message campaigns (Levy and Stokes, 1987).

Recent research in this area has since explored novel in-store interventions, which include: point-of-purchase nutrition labels (Berning et al., 2010a), eliciting preference for shelf-label nutritional information (Berning et al., 2010b), increasing the presence of healthy options at corner stores (Gittelsohn et al., 2010), point-of-purchase marketing campaigns targeted towards children (Holmes et al., 2012), healthy recipe cards as a shopping prime (Papies et al., 2014), social norm messaging displayed on shopping carts (Payne et al., 2015), healthy samples as a shopping prime (Tal and Wansink, 2015), incentives and educational information (List et al., 2015), and food item pre-ordering (Sadoff et al., 2015).² Recent examples also include experimental tests of the Healthy Incentives Pilot Program (HIP), a program created by the USDA Food and Nutrition Service providing 30% incentives for purchases of targeted fruits and vegetables (Klerman et al., 2014; Olsho et al., 2016).

We view field experimentation as complementary to alternative methods of data collection, including laboratory experiments, focus groups, surveys, and analysis of secondary scanner data. Our purpose here is to highlight the additional benefits that field experiments can offer relative to such alternative methods. Compared to the controlled environment of the laboratory, field experiments often provide opportunities to observe non-student participants. This is especially important when our goal is to study individuals' food choices: it is plausible that students (who primarily reside on a college campus) will exhibit different food purchasing behaviors than non-students, due to the unique environment of the college setting. Students may also be younger and have different socio-demographic characteristics than the population of interest. By conducting the study in a retail grocery store setting, the applicability of the findings to real world shopping decisions is arguably stronger when compared to similar studies run in the

² Note that experimentation in grocery and specialty food stores has also been used for other types of research questions. Lammers (1991) examined the effect of in-store product sampling on chocolate sales for a specialty candy store. Iyengar and Lepper (2000) tested whether consumers shopping in a gourmet grocery store were more likely to purchase specialty jam when a limited number of options were splayed, compared to a more extensive product offering. Lastly Lusk et al. (2001) explored the effects of taste testing and providing shoppers with tenderness information on grocery store consumers' willingness to pay for tender versus tough steaks.

controlled environment of the laboratory. Field experiments thus allow us to place the decision into the context where it is normally made – the grocery store.³

Complementary to field experiments, focus groups, interviews, and surveys are also helpful in the research process because they can tell us about what shoppers believe they might do or what shoppers prefer. Going beyond these methods though, field experiments allow us to put shoppers into real (rather than hypothetical) situations in which they make real choices – and through these choices, reveal their actual preferences. Such information is particularly valuable in a food choice setting, as there may be disconnect between what people say they would do, and what they actually do.⁴ Combining field experiments with focus groups, interviews, or surveys may provide a richer understanding of the decision data collected. For example, while field experiments can help us understand what decisions are actually made, we can also ask more detailed questions about subjects' decision-making process in surveys administered following the experiment, as well as collect pertinent demographic information. Alternatively, experiments can also be carefully designed with treatment arms that allow for the ability to later parse out motivations that are driving the behaviors of interest. This is especially useful in situations where it may not be feasible or desirable to administer a post-experiment survey.

Learning about food purchase behavior in the field holds promise for academics, practitioners, and policymakers alike. For academics, the use of a natural context in field experiments can inform decision-making theories. For example, the economic theory of dynamic inconsistency provides a reason for the observed difficulty of saving more for the future, exercising more, and eating healthier, despite stated desires to make those changes (Laibson, 1997; O'Donoghue and Rabin, 1999; Gul and Pesendorfer, 2001; Fudenberg and Levine, 2006). Yet dynamic inconsistency is usually empirically evaluated in laboratory decisions, rather than in the contexts in which it was meant to be applied. One exception is Sadoff et al. (2015), who partnered with a grocery store to examine the role of dynamic inconsistency on food purchasing. Sadoff et al. (2015) find substantial dynamic inconsistency in the field setting, and are the first to carefully document this existence in the field.

Practitioners, such as grocery store owners, may also benefit from field experimentation. Store owners may already experiment with different marketing techniques, re-arranging displays, or promoting

³ It is important to note that numerous studies do employ laboratory experiments to explore decision making related to food choice (see Pliner and Mann, 2004; Marette et al., 2010, 2012). Laboratory experiments can be beneficial as they allow for the ability to control the environment and explore hypothetical scenarios or observe actual consumption behavior. For example, Pliner and Mann (2004) used a laboratory setting to observe subjects' private, unlimited consumption of cookies during a rating task, where information about previous participants was also displayed. Marette et al. (2010) used a laboratory study to explore consumer willingness to pay (WTP) for a cholesterol reducing food item among two distinct groups: those with at least one child between 3 and 16, and those with either high cholesterol themselves or a spouse with high cholesterol. In a later study, Marette et al. (2012) used a laboratory experiment to explore WTP for a hypothetical reduced pesticide use label for apples.

⁴ A literature has emerged in economics that considers the extent to which hypothetical and real decisions diverge. This literature has come to conflicting findings. The majority of the work has focused on value elicitation. For instance, List and Gallet (2001) and Lusk and Schroeder (2004) concluded that individuals often overstate their preferences when making hypothetical as compared to real decisions. Interestingly, not all prior studies have uncovered hypothetical bias. For example, Johnston (2006) found no difference between hypothetical and 'real' voting for an environmental referendum. Kühberger et al. (2002) suggest that contradictory findings may be attributed to the perceived importance of after-effects resulting from the choices made. While no study to our knowledge has compared hypothetical versus real food selection outside of WTP elicitation, given Kühberger et al.'s (2002) conclusions, it is plausible that for food choice, the consequences of selection (actually taking the product home to consume) are higher under real versus hypothetical choice scenarios. Further, Sadoff et al. (2015) found disconnect between what individuals order for delivery, and what they actually want to receive at delivery. In particular, in their study advance food choice was systematically healthier than immediate food choice. Therefore, eliciting hypothetical decisions in this setting may result in a bias of decisions towards healthier options, relative to when real decision making is employed.

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