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Connecting cognition and consumer choice

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ABSTRACT

We describe what can be gained from connecting cognition and consumer choice by discussing two contexts ripe for interaction between the two fields. The first—context effects on choice—has already been addressed by cognitive science yielding insights about cognitive process but there is promise for more interaction. The second is learning and representation in choice where relevant theories in cognitive science could be informed by consumer choice, and in return, could pose and answer new questions. We conclude by discussing how these two fields of research stand to benefit from more interaction, citing examples of how interfaces of cognitive science with other fields have been illuminating for theories of cognition.

1. Introduction

Consumption is a ubiquitous and important aspect of people's lives. The theories of consumption and consumers developed in consumer research represent more than a domain of application—they represent an indispensable part of the behavioral sciences. Consumer research aims to understand consumption and consumers, developing theories that range from the altruistic (e.g., charitable giving) to the selfish (e.g., competitive influences on decisions), and from the concrete (e.g., expectations about a given product) to the abstract (e.g., expected or experienced happiness). But why should cognition and consumer research grow closer?

We can think of four reasons: First, some of the most consequential choices people make are consumer choices: Which house do I buy? How will I finance it? When do I replace my car, or should I rely on more environmentally friendly modes of transportation? Consumer choices are twice as large as the borrowing and savings of firms in the US (Tufano, 2009). Even trivial decisions can be impactful. Spending $4.73 on a cappuccino every day for a year amounts to $1726 and 26,645 calories (which would take 121 h of walking to burn off). Over a lifetime, these choices affect health, wealth, and happiness.

Second, cognitive science can improve people's lives through its interaction with consumer choice. People do not always choose what is in their long-run interest, and consumers and policy-makers want to help consumers make better choices. We can use what we learn about cognitive principles to facilitate good decision making through the design of choice environments, for example. Cognitive science could bring a more sophisticated notion of consumer's cognitive abilities and limitations than what is presented in economics (see Chater, 2015) to the design of choice architecture.

Third, consumer settings provide rich data that are hard to match in the lab and in other applied. Firms, governments, and NGOs often run experiments involving large samples and consequential decisions in domains of interest to cognitive science. Field data has informed questions about thinking and decision making, including examinations of anchoring effects in credit card repayments (Navarro-Martinez et al., 2011), of reference-dependent valuation in demand shocks created by price changes

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(Hardie, Johnson, & Fader, 1993), and of attentional processes (Johnson, Moe, Fader, Bellman, & Lohse, 2004) and belief updating in consumer search (Moorthy, Ratchford, & Talukdar, 1997).

Finally, the consumer choice is natural domain to study basic cognitive processes. As Sloman (2015) notes, a recent trend is a shift from studying cognitive function for its own sake to studying cognition in the service of explaining other things, which sometimes means engaging with questions from other fields (e.g., "how can we help consumers make better decisions?"), and understanding the role of cognitive functions in these contexts can, in turn, produce basic insights about cognition (c.f. Baddeley, 2012). Indeed, much of the research program of Kahneman and Tversky was inspired by this kind of naturalistic observation.

Broadly speaking, consumer research can be described by three areas: One is "information processing", focusing on the interplay of affective and motivational processes on cognitive process to understand areas like persuasion and implicit influences on consumer behavior (Johar, Maheswaran, & Peracchio, 2006). Its nearest neighbor in psychology is social cognition (Simonson, Carmon, Dhar, Drolet, & Nowlis, 2001), although topics often identified with cognitive science, like categorization and inference, are also examined (Loken, 2006). A second area is "consumer culture theory", using qualitative data to examine the experiential and sociocultural dimensions of consumption (Arnould & Thompson, 2005). A third area is "behavioral decision research" which often compares normative (how people should make decisions), descriptive (how they actually decide), and prescriptive (how decisions can be improved) analyses of choice and its underlying process (Kahn, Luce, & Knowlis, 2006). Our focus is the engagement of cognitive science with (i) behavioral decision research in consumer behavior and (ii) field data from marketing (e.g., sales data, market shares, clickstream data, etc.). We describe two advancing areas of cognitive science that we think should be informed by and should inform consumer choice research.

2. Consumer choice in context

Choice, and particularly the study of context effects, has long been a focus of behavioral decision research and has generated a successful interaction with cognitive science. Researchers in consumer choice have documented violations of value maximization (see, e.g., Simonson & Tversky, 1992; Tversky & Simonson, 1993). One result, the attraction effect, showed that adding an asymmetrically-dominated third option to a binary choice increases the likelihood of choosing the asymmetrically-dominating option (Huber, Payne, & Puto, 1982). A second, the compromise effect, identified conditions where adding an option surrounded by two other options would gain choice share relative to that predicted by value maximization (Simonson, 1989). A third, the similarity effect, showed that introducing a third option too close to one of two other options causes it to split the share with its neighbor (Tversky, 1972). Because attraction and compromise effects violate the assumptions underlying discrete choice models, which were the standard models for predicting consumer choice in quantitative marketing, this represented an important applied problem.

Cognitive science has attempted to produce models that account for these effects, many of which share the idea that evidence supporting a choice accumulates stochastically over time (Bhatia, 2013; Bogacz, Usher, Zhang, & McClelland, 2007; Roe, Busemeyer, & Townsend, 2001; Trueblood, Brown, & Heathcote, 2014; Tsetsos, Usher, & Chater, 2010; Tsuzuki & Guo, 2004; Usher & McClelland, 2001; Wollschläger & Diederich, 2012). Although none has emerged as the dominant account of these context effects, these models have been successful intellectual achievements. Each provides a unified framework for understanding three phenomena that seem very different: Adding a third option increases share in some cases, decreases it in others. These models also predict other variables, like decision time and information search. These secondary predictions allow the models to be more easily falsified, leading to useful modifications and innovations (Johnson, Schulte-Mecklenbeck, & Willemsen, 2008). And they seem highly generalizable: Context effects apply not just to preferential choice, but also to perceptual judgments (Trueblood, Brown, Heathcote, & Busemeyer, 2013), and some evidence suggests that these effects generalize to hummingbirds (Bateson, Healy, & Hurly, 2003), honeybees (Shafir, Waite, & Smith, 2002) and slime molds (Latty & Beekman, 2011).

We suggest that these modeling efforts could begin to be more informed by and to engage with consumer choice research to examine issues like (i) testing out-of-sample predictive accuracy, (ii) testing whether different parameters (or different models altogether) are needed for different consumers or types of goods, (iii) making use of field rather than laboratory data. So, why is this connection between cognition and consumer choice in its beginning stages?

First, these modeling efforts are largely concerned with producing the output—a successful model uses a general mechanism, common across individuals, to reproduce all three effects. However, much of consumer choice research uses boundary conditions, moderation of effects, and individual differences to build theories of choice processes (Kahn et al., 2006). Applying this logic to context effects generates a series of questions: Do context effects occur in experts (i.e., experienced consumers)? (See Trueblood, 2012 for evidence of individual differences.) Will they be similar in all kinds of product choices? Are they affected by the importance of the decision? Does order of consideration matter? (One of many reasons to expect it does: Firms pay significant money to ensure product placement at eye-level. See Noguchi & Stewart, 2014 for an investigation of how gaze transitions relate to context effects.) Most cognitive models do not have much to say about these issues, but could, and doing so would both increase their relevance for consumer choice and their ability to be applied in other choice domains, such as political science or health.

A second consideration is ease in applying these models. Although discrete choice models commonly used in consumer research may be oversimplified, using assump-