Research Dialogue

# Choice theories: What are they good for? ☆

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## Abstract

Simonson et al. present an ambitious sketch of an integrative theory of context. Provoked by this thoughtful proposal, I discuss what is the function of theories of choice in the coming decades. Traditionally, choice models and theory have attempted to predict choices as a function of the attributes of options. I argue that to be truly useful, they need to generate specific and quantitative predictions of the effect of the choice environment upon choice probability. To do this, we need to focus on rigorously modeling and measuring the underlying processes causing these effects, and use the Simonson et al. proposal to provide some examples. I also present some examples from research in decision-making and decision neuroscience, and argue that models that fail, and fail spectacularly are particularly useful. I close with a challenge: How would consumer researcher aid the design of real world choice environments such as the health exchanges under the Patient Protection and Affordable Care Act?

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## Introduction

*What should a choice model do?*

At one time, the job of choice theories was simple: They simply needed to predict, given a set of attributes, what choices would be made. Now the demands on accounts of choice are much greater, for several reasons:

- As noted by Simonson et al., the range of possible influences on choice has increased. While the values of options on attributes clearly contribute to choice, other factors have come to the fore, in theory, and particularly in the choice sets commonly studied: Those with few options, most of which are on the efficient frontier. The authors bravely attempt to provide a framework that could include many of these influences, but the list is getting long and unruly.

- Many of these factors have concrete real-world effects. For example, the selection of defaults has a marked influence on outcomes that affect lives (Johnson & Goldstein, 2003) and pension savings (Carroll, Choi, Laibson, Madrian, & Metrick, 2009; Madrian & Shea, 2001; Thaler & Benartzi, 2004). The order of attributes and their sorting (Lynch & Ariely, 2000), and even whether or not alternatives appear on the 1st or 2nd screen of a web site, have real marketplace influences. Increasingly, it appears that value maximization considerations are far from sufficient to predict what is chosen, and that even the simple goal of prediction requires the incorporation of context.

- But more importantly, these factors are particularly important given that many important choices are not made with the alternatives in front of the decision-maker, but instead on some abstraction like a webpage, or more quaintly, a mail-order catalog. These choice environment have been termed a marketplace of the artificial (Johnson, Bellman, Lohse, & Mandel, 2005) or choice engines. These choice engines allow us to display information in many ways, unbounded by the physical product, providing greater latitude in what Thaler and Sunstein call choice architecture (see Johnson et al., 2012 for a recent review; Thaler &

Sunstein, 2008). This creates a new role for choice modeling: Advising a choice architect who has many degrees of freedom, and the potential for great impact upon choice and can be, in some cases, independent of the values of the options. Thus, choice theories must not only need to tell us what is being chosen, but be able to predict the effect of many of these design decisions. If choice modeling is to be truly useful, it needs to embrace these challenges.

## Comparisons

In this paper, Simonson et al. bravely take on part this task, trying to unify a number of diverse results in the judgment and decision-making literature using a circumscribed yet psychologically plausible set of constructs. To do this, they make two major moves:

- They posit that the comparison of alternatives on attributes is an essential component of choice.
- They argue that decisions are often made by attending to the subset of potential comparisons, neglecting others, and propose some preliminary ideas about the mechanisms that could be used to determine which comparisons are salient.

The first tactic, focusing on comparisons of options on attributes, puts them in good company, part of a long tradition and judgment and decision-making research. These comparisons models historically date back at least to the additive differences model (Tversky, 1969), and its progeny: majority confirming dimensions (Russo & Dosher, 1983), etc. More recent examples of similar ideas includes the work of Gonzalez-Vallejo (González-Vallejo, 2002; González-Vallejo, Reid, & Schiltz, 2003), and Brandstäter et al. (Brandstätter, Gigerenzer, & Hertwig, 2006).

While attribute-wise comparisons are potentially quite fruitful, and produce choices with increased cognitive ease, they face their own challenges and any choice theory needs to respond to both challenges:

- What kind of information is produced by the comparison? This could range by simply noting ordinal information, identifying which alternative is better on the attribute, to encoding interval or even ratio differences in utility, consistent with a model like additive differences.
- How are these comparisons integrated across attributes? Some differences are larger than others, and some attributes are more important than others. At one extreme, these differences could be ignored: One could simply count the number of winners (Alba & Marmorstein, 1987). At the other extreme, one can weigh the differences in utility, producing a model that can, in the aggregate, be indistinguishable from value maximization (Tversky, 1969).

The second insight, that not all comparisons are salient, is very important, and quite challenging: The task of identifying what information presented the decision is daunting, and, as the authors observe, seems to be composed of both goal driven (top-down) and data-driven (bottom-up) influences. The authors start this hard work by sketching a two-factor model, but it would be useful to specify a parametric stand on both these issues, which would, of course, require a more formal model.

## Where do we go from here? Process models still deserve process data

Given the demands presented by these new uses of choice models how should we proceed? Let me say that the road will be particularly daunting if we find ourselves relying on the paradigm of manipulating independent variables and observing choices, a paradigm that has dominated much recent consumer research. It has been argued that models that depend only on inputs and choices are not well specified and not easily falsified (Otter, Allenby, & Van Zandt, 2008; Ratcliff & Mckoon, 2008). Psychology offers a classic example: The debate concerning the nature of visual mental imagery. One side that the representation of visual images is described by the same code as the representation of language (Pylyshyn, 1973), and on the other side that the representation actually depicts the elements of an image (Kosslyn & Pomerantz, 1977). Anderson (1978) showed that such debates are, in themselves, fruitless because there is an unrestricted tradeoff between the properties of a representation and the complexity of the accompanying processes.

Progress in these debates, when it occurs, usually comes from the introduction of new constraints in the form of new data about either the process or representation. For example, showing that patterns of activation in the visual cortex corresponded to a pattern shown to respondents was a strong support for the image representation view (Kosslyn, Thompson, Kim, & Alpert, 1995). By producing theories that make predictions for characteristics of the choice process other than choice, we may produce models that are both more falsifiable and easily distinguished from one another. Since our toolbox of possible measures has increased markedly in the last two decades, perhaps our theories should embrace this richness.

This suggests a radical proposition: That models that fail, and fail spectacularly will best serve the enterprise of understanding choice. By this I suggest models that make very clear predictions, for multiple dependent measures, that can be cleanly tested. Just as the demand for choice models have grown to include the effect of many factors unrelated to value maximization by the options, the predictions made by choice models need to include characteristics other than observed choice.

Given that the model proposed by Simonson et al. emphasizes comparisons, it might be fitting to suggest that observing comparisons might be an essential component of effective model development. Observation of specific comparisons can easily be accomplished, either through eye tracking, a technology increasingly common in behavioral research, web-based information monitoring, verbal reports, or the use of a verification task. For example, there are now many studies that examine what Weber and Johnson (see also Brownstein, 2003 for a review; Weber & Johnson, 2009) call Decision by Distortion, the observation that attribute values are distorted in favor of the initial leader in choice. In Willemsen, Bockenholt,