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Encouraging Energy Efficiency: Product Labels Activate Temporal Tradeoffs

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We introduce a new "10-year energy cost" labelling technique that activates latent consumer goals, increasing the proportion of energy-efficient choices from 12% to 48% in a field study. In four lab studies, we demonstrate the mechanism and superiority of this technique relative to existing alternatives.

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Special Session Summaries

Customized Nudges: Choice Architecture for a Heterogeneous World

Chair: Kirstin C. Appelt, Columbia University, USA

Paper #1: Effective, Selective Choice Architecture: Checklists as a More Precise Tool

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Paper #2: Encouraging Energy Efficiency: Product Labels Activate Temporal Tradeoffs

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Paper #3: Smart Choice Sets

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Tom Baker, University of Pennsylvania, USA
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Paper #4: Choosing Not to Choose: Consumers Are More Satisfied With a Product When It Is Determined by a Prediction Algorithm Than When They Personally Chose It

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SESSION OVERVIEW

There is great interest in choice architecture interventions which can change behavior, usually termed nudges (Thaler and Sunstein 2008). To date, this research has focused largely on means (i.e., what is the average impact?) rather than variance (i.e., who is helped and how much? who is harmed and how much?). These papers look at a new generation of choice architecture tools that are customized to meet the differing needs of a heterogeneous population. They ask whether nudges can be both effective *and* selective—can choice architecture interventions have a large impact *and* be customized to individual circumstances?

Many first-generation nudges targeted choices where a single solution approximates most individuals' needs. For example, different individuals should save at different rates, but encouraging everyone to increase savings from near-zero rates benefits most individuals (Thaler and Benartzi 2004). Yet, even with these decisions, there are some people who may need or prefer different options. Further, many important decisions are complex and an intervention which nudges everyone toward the same choice option can hurt some individuals. For example, different individuals have different health needs and encouraging everyone to choose the same insurance plan may help some individuals (e.g., by saving money), but harm other individuals (e.g., by limiting access to specific types of care). This session explores choice architecture interventions designed for a world where individual consumers' circumstances, needs, and preferences may differ.

Our first paper explores whether *preference checklists* help consumers make better decisions that better match their individual needs. Specifically, preference checklists encourage consumers to consider choice-relevant factors that they might otherwise omit; list items are clustered so that reasons supporting one choice option precede reasons supporting other choice options. Appelt and colleagues find that preference checklists significantly influence choice *and* demonstrate selectivity compared to a standard nudge (i.e., a default).

Our second paper investigates whether activating latent goals helps people make choices more in line with their preferences. Specifically, energy-efficient products which cost more upfront but save energy and money in the long run are a better choice for most, but not all, individuals. Hardisty and colleagues find that “10-year energy cost” labels encourage individuals with latent long-term cost minimizations goals to purchase energy-efficient products.

Our third paper asks whether *smart choice sets* can overcome the curse of choice and improve choice outcomes. Specifically, smart choice sets sort choice options based on consumer preferences and partition options into top recommendations and other options (i.e., “the best and the rest”). Dellaert and colleagues find that smart choice sets balance preference-matching and choice costs to help consumers make better decisions.

Our fourth paper explores the interaction between customized choice architecture and the preference for free choice. Specifically, although consumers traditionally prefer free choice, the popularity of services using preference algorithms to provide tailored products suggests that consumers are willing to waive free choice when externally determined choices are based on their own preferences. Cornil and Klesse find higher satisfaction ratings for choices determined by preference algorithm than by personal choice.

Effective, Selective Choice Architecture: Checklists as a More Precise Tool

EXTENDED ABSTRACT

Nudges, or choice architecture interventions which can change behavior (Thaler and Sunstein 2008), have been shown to have large impacts on decisions about such diverse topics as organ donation (Johnson and Goldstein 2003), healthcare (Johnson et al. 2013), and retirement planning (e.g., Knoll, Appelt, Johnson, and Westfall 2015; Brown, Kapteyn, and Mitchell 2011; Liebman and Luttmer 2009; Thaler and Benartzi 2004). However, nudges may act as a blunt tool, affecting people for whom a behavior change would be welfare enhancing *and* those for whom it would be welfare reducing. Better interventions might customize their effects and be selective, depending upon the individual's circumstances and needs.

We introduce a new choice architecture tool, a *preference checklist*, which is a list of choice-relevant factors that consumers might want to consider when making a decision, but often do not due to various factors such as time pressure, lack of information, or output interference. As suggested by query theory (Johnson, Häubl, and Keinan 2007; Weber et al. 2007), checklist items are clustered into factors supporting one choice option or another. Because people tend to construct their preferences for a decision by considering options sequentially, to generate more arguments in favor of the first-

considered option, and thus to choose the first-considered option (Johnson et al. 2007; Weber et al. 2007), the order of the clustered checklist items should have an effect on consumers' choices. Unlike other interventions, such as defaults, checklists do not benefit from disengagement with the decision and instead ask people to more fully consider their options, thinking about which factors are relevant to them. Thus, this type of intervention may be more responsive to individuals' differing needs and have a customized effect.

We report the results of three studies investigating the age at which people prefer to start claiming their Social Security (SS) retirement benefits. The majority of Americans claim benefits early, with roughly half claiming benefits at the earliest possible age (Muldoon and Kopcke 2008; Song and Manchester 2007). For the average consumer, this is a financial mistake (Burtless and Quinn 2002; Coile et al. 2002): It reduces the amount of their monthly check as well as the amount of their overall lifetime benefits. At the same time, the optimal claiming age depends upon many factors, especially expected longevity, current income and retirement savings, and job satisfaction and security. Thus, successful interventions need to act selectively: delaying claiming age for those who should delay, but not delaying claiming for those who should claim early, such as those with a lower life expectancy.

In all three framed field studies, we use web-based samples of older Americans. To ensure the hypothetical benefit claiming decision is relevant to participants, we screen potential participants based on age and benefit eligibility. Participants are invited to continue the study if they are: (1) between the ages of 45 years old and 65 or 70 years old, and (2) either already eligible or expecting to become eligible for SS retirement benefits.

In study 1, we present 309 participants with two checklists constructed from thought listings from prior work (Knoll et al. 2015). The lists contain eight reasons supporting claiming benefits early and eight reasons supporting claiming benefits later. Participants are randomly assigned to see checklist items in one of three orders: the typical order in which people consider the decision (i.e., a checklist of pro-early items followed by a checklist of pro-later items), the reverse order (i.e., a checklist of pro-later items followed by a checklist of pro-early items), or a neutral order (i.e., two checklists of interspersed pro-early and pro-later items). All participants are then asked when they would prefer to claim benefits. Participants who respond to checklists in the reverse order significantly delay preferred claiming age, by 14 months compared to the typical order. The average claiming age in the neutral order is between that of the other two orders, suggesting that salience alone does not account for the effect.

Study 2 ($N = 344$) replicates this result and also examines whether output interference is responsible for the order effect, by examining the time participants spend considering each checklist item. Indeed, the difference in response time completely mediates the effect of checklist order on preferred claiming age: Participants spend more time interacting with the items in the first checklist, and, when this is the pro-later list, this encourages them to delay claiming.

Study 3 ($N = 451$) examines whether the "right" people are affected by the checklists and compares the checklist intervention to a default set at the latest claiming age. Using a standard set of questions, we estimate longevity to, in turn, estimate the optimal claiming age for each individual. We demonstrate again that the reverse-ordered checklist causes a significant delay in claiming relative to control, as does, to a lesser extent, the default. However, the default affects those who should claim early *and* those who should delay, whereas the checklist shows selectivity by reducing the average claiming "error" by 39% relative to control. In other words, the reverse-ordered checklist minimizes the difference between when

participants *should* claim benefits based on their life expectancy and when they *prefer* to claim benefits.

There is growing evidence that choice architecture can substantially improve outcomes for important decisions in a wide range of domains. However, there is also concern that these approaches may ignore individual circumstances and preferences and nudge everyone in the same direction. The current research offers hope that not all choice architecture interventions are blunt tools. Compared to defaults, preference checklists may work as a more selective tool that has the biggest impact on those who would benefit most. Preference checklists can easily be applied to other contexts where consumers struggle to make the right choice, such as saving for retirement, allocating a limited budget, choosing a health insurance plan, et cetera.

Encouraging Energy Efficiency: Product Labels Activate Temporal Tradeoffs

EXTENDED ABSTRACT

Many interventions designed to encourage energy-efficient choices are coercive or blunt. For example, energy inefficient incandescent lightbulbs were outlawed in several U.S. states and Canadian provinces because consumers kept buying them in spite of the large energy savings possible with energy-efficient CFL and LED bulbs. Likewise, defaults are a powerful tool (Dinner et al. 2011) but run the risk that they may nudge consumers in a direction they do not want to go -- more paternalistic than libertarian. Another class of energy efficiency interventions is designed to give consumers more information and thus to improve the quality of their choices without compromising personal freedom. However, these have a mixed record of efficacy (Anderson and Claxton 1982; Abrahamse et al. 2005; Min et al. 2014).

We demonstrate that informational nudges are effective when they tap into a latent consumer goal, such as long-term cost minimization. Normally, when consumers are making purchases, they do not think about long-term costs. However, through a "10-year energy cost" label, we activate this latent goal, thus dramatically increasing the proportion of energy-efficient choices without being coercive. This intervention taps into the latent goals of some consumers but not others (Study 2), and thus serves as a selective nudge (only influencing consumers that care about the attribute) rather than a blunt hammer.

Study 1a shows that 10-year cost labeling substantially increases the proportion of energy-efficient choices. In partnership with a local utility company, BC Hydro, a sample of 147 Vancouver-area residents made hypothetical choices about lightbulbs, TVs, furnaces, and vacuums, in which more energy-efficient products were more expensive upfront. For example, participants chose between two 60-watt incandescent bulbs for \$0.97 and two 13-watt CFL bulbs for \$17.99. In the "10-year cost" condition, we calculated the average dollar cost of each bulb pack over 10 years (using current electricity prices and average usage rates) and displayed this information directly underneath the upfront cost. Thus, in the "10-year cost" condition (a between-subjects manipulation), participants also saw that the 10-year cost of two 60-watt bulbs was \$239, while the 10-year cost of two 13-watt bulbs was \$52. Across all four product categories, this manipulation significantly increased the proportion of energy-efficient choices, from 50% to 79% on average.

Study 1b demonstrates the effectiveness of this method in a field study in five drug stores over a period of six weeks, with real purchase decisions made by naïve shoppers. Price labels for light bulbs on store endcaps were changed each week (balanced between stores). Shoppers purchased the energy-efficient bulb 12% of the

time with control labels and 48% of the time with 10-year energy cost labels, $p < .001$.

In Study 2 selective goal activation mediates the effect of “10-year cost” labeling on choice. As 242 MTurk participants considered the product pairs, they indicated their goals when shopping for that type of product. These goals were later coded to indicate whether they concerned long-term costs. Choice results replicated Study 1 results, and also demonstrated that 10-year cost labelling is more effective than 1-year cost or 5-year cost labelling. Furthermore, participants in the control condition rarely mentioned long-term costs, while participants in the 10-year cost condition mentioned long-term costs more frequently and prominently. These long-term cost goals strongly predicted choices and mediated the effect of labelling on choices. In other words, when participants were reminded of long term costs, some of them cared a lot about this, and the nudge had a strong effect on their choices, whereas other participants still did not care about this goal, and the nudge had little effect on their choices. This demonstrates the selectivity of the nudge, as it taps into the existing goals that some consumers have but others do not.

In Study 3, we used an alternative method to activate the long-term cost minimization goal. In addition to the control and “10-year cost” conditions used in earlier studies, we added a “subjective cost estimation” condition. In this condition, 245 MTurk participants saw the same information as in the control condition, and were asked to estimate the 10-year energy cost (in dollars) of each product before making their choice. The choice proportions of participants in this cost estimation condition were identical to those in the 10-year cost condition (and significantly higher than those in the control condition). Furthermore, the average energy costs estimated by participants in the estimation condition were fairly close to the actual energy costs (a “wisdom of the crowds” effect). Thus, it is NOT the case that the 10-year cost labeling simply provides participants with new information. Rather, the 10-year cost label works by activating the latent long-term cost minimization goal, and we demonstrate that alternative means of activating this goal similarly impact choices, even without the provision of new information.

In a sample of 254 MTurkers, Study 4 demonstrates the specificity of the long-term cost minimization goal: although consumers are sensitive to future dollar costs (Min et al. 2014), other frames such as energy savings or dollar savings do not have much effect on choices. Thus, the labelling techniques currently used on energy-efficient products (which emphasize dollar savings or energy savings) may not be very effective. Likewise, this explains why some previous informational interventions in the literature were not effective.

This intervention is more effective than all other known informational interventions, and is less coercive than other tools such as defaults or legal measures. It has broad potential application, because it can be used for all types of energy-using products, including those that have not yet been invented. It should be attractive to retailers because it can be used to nudge consumers towards more efficient, expensive products, and retail firms do not profit from energy costs. This intervention should also be attractive to consumers because it reduces their costs in the long run, and to society because it has the potential to reduce energy usage and environmental harm.

Smart Choice Sets

EXTENDED ABSTRACT

It is no news that consumers and other decision-makers are faced with a massive increase in available options. Increases in the ability of firms to generate more options and the use of online markets to present these options suggest the possibility of choice over-

load: that by presenting consumers with more choices, they will pick worse options, a phenomenon labeled in the popular media as the Curse of Choice.

Determining how many options to present to a decision-maker might be thought of as balancing two factors (for an excellent review, see Chernev, Böckenholt, and Goodman 2015). The first, which can be thought of as a blessing, is that more options may generate a better match between what the decision-maker wants and what is available. The second, representing the curse, is that adding options increases the cost of evaluating options. Since decision-makers have limited time and cognitive resources, the result may be that they either abandon search too quickly, or adopt a simplified rule or heuristic, leading to suboptimal choice. In this paper, we suggest that well-designed choice architecture (Johnson et al. 2012; Thaler and Sunstein 2008) can be used to deliver the benefits of increasing the number of options while minimizing its costs.

Specifically, in this paper we test one possible way of reducing the costs of search without decreasing the utility of the chosen option. We (1) explore the problem with an analytical model which shows the conditions under which our proposal helps, (2) present two online studies to test the utility of the mechanism, and (3) analyze field data from a large provider of health insurance.

Our model is a new synthesis of existing choice architecture tools: *Smart choice sets* are a non-binding choice architecture which helps overcome consumer information overload in large choice sets. Smart choice sets combine three existing techniques. The first is sorting the list of options. The second is to use a model of the consumer’s preferences and to use a prediction of how well each option fits those preferences as the basis of that sort. The third is to partition the set into two components, a primary and a secondary list. This focuses attention on a small set of top recommended options, but provides the possibility of clicking through to the full set of options. We present both theory and empirical evidence that smart choice sets improve the outcomes of choices and reduce effort.

Sorting by a single product attribute, for example price, has a significant effect on what is chosen, but this change is not necessarily an improvement. The typical result is that the sorting attribute is more heavily weighted, a result that may be good or bad (Lynch and Ariely 2000). In contrast, presenting products in order of predicted attractiveness can be an effective way to assist decision making (Dellaert and Häubl 2012; Häubl and Trifts 2000). However, even in sorted lists finding the best product can be daunting for consumers (Johnson et al. 2013). Decision-makers adopt simplification procedures that ignore information. They often eliminate options based on a single attribute, even when the number of options is small, and this can lead to inferior choices. In addition, the use of heuristics, can, paradoxically, cause consumers to search too much in sorted lists, which lowers their decision outcome quality (Diehl 2005).

Therefore smart choice sets provide decision guidance by presenting only the most highly recommended products (which we call the “recommended set”), with the option to click through to see the complete recommendation list with all available products (i.e., the “full set”). Behind smart choice sets is the idea that people can choose how to choose and use decision processes that vary in the quality of decision outcome and in the effort required to use them. Smart choice sets can focus the decision-maker’s limited cognitive resources on the best decision strategy and the best subset of alternatives. In this way, partitioning, modeling and sorting are important complements in helping individuals cope with information overload. Partitioning limits the number of options that are considered and encourages the use of better strategies to choose among the consider-

ation set. Sorting on predicted preferences ensures that only the best alternatives are in the partitioned choice set.

We examine the proposed effects in two online survey-based experiments and a field study in the domain of consumer health insurance product choices. In Study 1 (N=858) we find support for the predicted effects of sorting and partitioning. In a 2x2 experiment the quality of the recommendation's sorting and the presence of partitioning were manipulated. We find that both higher quality sorting and partitioning improve consumer choice outcomes. Study 2 (N=1,577) extends Study 1 by also introducing a close to random sorting condition; in addition in this study respondents were asked to choose on behalf of someone else according to a preset decision rule. This allows for objective benchmarking of decision quality. The results replicate the findings of Study 1. In addition, they highlight the important complementarity between sorting and partitioning, in that we find a reversal of the impact of partitioning for the near to random quality sorting condition, where consumers' choice outcomes were worse rather than better when presented with a partitioned list. In the field study (N= 43,632) we analyzed data from a large online health insurance product comparison website in the Netherlands that introduced a new choice architecture that closely mimics smart choice sets. Results from this third study provide external validity and further support for the proposed impact of sorting and partitioning on consumer choice outcomes. After the introduction of the new choice architecture, significantly more consumers chose one of the top recommended alternatives on the website.

We conclude by discussing the drivers of optimal smart choice set size. Partitions that are too large may harm decision outcomes, but partitions that are too small may unduly limit consumer choice. We generalize the insights from our research in terms of optimal smart choice sets size depending on recommendation list quality and consumer decision error.

Choosing Not to Choose: Consumers Are More Satisfied With a Product When It Is Determined by a Prediction Algorithm Than When They Personally Chose It

EXTENDED ABSTRACT

The main criticism lobbed at choice architecture interventions is that, while trying to nudge consumers to make "better choices" (e.g., Johnson et al. 2012; Thaler and Sunstein 2008), they actually restrict consumers' freedom of choice. It has repeatedly been demonstrated that individuals are more satisfied when they can choose themselves compared to situations in which they cannot (e.g., Burger 1989; Cordova and Lepper 1996; Langer 1975). According to past research, there are two main reasons why consumers value their freedom to choose. First, choosing is inherently rewarding (Botti and Iyengar 2004; DeCharms 1968) and, second, consumers feel that only they can choose products that match their personal preferences (Averill 1973; Bem 1967; Collins and Hoyt 1972).

However, recent advances in technology have increased companies' ability to suggest products that match consumers' preferences, without having them choose. For instance, Netflix or Spotify utilize "rating prediction" algorithms that track their users' consumption behavior in order to suggest songs or movies that their customers will like. In this research, we focus on such common business practices and demonstrate that consumers are actually more satisfied with an assigned (not-chosen) song rather than with a self-chosen song, as long as that song matches their preferences.

In doing so, our findings are in contrast with research highlighting the advantage of choice over no-choice for consumer satisfaction. Notably, existing studies have predominately focused on

situations where preferences are constructed on the spot (e.g., Botti and McGill 2011). For instance, individuals were presented with different formats for a photography museum, or a list of ambiguous dishes on a restaurant menu (Botti and McGill 2011). In contrast, our research focuses on situations where consumers have clearly pre-existing preferences (e.g., music). We hypothesize that in such situations, "assigning" a song that matches consumers' pre-existing preferences—through rating prediction algorithms—will yield greater satisfaction than if individuals choose it themselves. We further reason that this occurs because the preferred song was correctly predicted by the algorithm and not because it may have been assigned by chance (e.g., feeling lucky).

To test our hypotheses, we first developed a prediction algorithm. We asked 200 MTurkers to evaluate 21 preselected songs and 61 artists of various genres. We ran a factor analysis of the evaluations of the 61 artists, and identified eight factors each loaded by three artists (24 retained artists in total), with high eigenvalues and item-total correlations. These eight factors corresponded to eight distinct music genres (e.g., eighties-rap, hard-rock, modern-pop, etc.). Then, for each factor, we identified the "best song" (highest positive correlation with the factor), "worst song" (highest negative correlation with the factor), and "average song" (correlation closest to zero with the factor).

We then used our song prediction algorithm in an experimental study with 250 MTurkers. First, all participants evaluated the 24 artists. The survey software automatically calculated each participant's preferred genre. Then, participants were assigned to a 2(choice vs. no choice) x 2(target song: "best song" vs. "average song") between-subject design. In the "no choice" condition, participants received the target song. In the "choice" condition, participants could choose to listen either to the target song or to the "worst song." We selected the "worst song" as the non-target option for two reasons: First, such an easy choice task (a small choice set with a clearly dominant option) increases choice satisfaction (Botti and McGill 2006), allowing a conservative test of our hypotheses. Second, most participants in the choice condition should choose the target song so that the outcome is kept constant for all participants. Finally, participants rated their satisfaction with the assigned/chosen song. A regression analysis of satisfaction revealed a main effect of target song (participants enjoyed the "best" song more than the "average" song), and more importantly, an interaction effect of target song and "choice vs. no choice". As hypothesized, when the target song was the best song, non-choosers were significantly more satisfied than choosers. When the target song was an average song, choosers were directionally more satisfied than non-choosers.

This first study showed that when consumers can listen to a song that matches their preferences, they are more satisfied when it is assigned to them than when they personally choose it. Are they satisfied because their preferences were correctly identified, or because they felt lucky? We answered this question in a second study. 160 MTurkers first completed the artist evaluation survey. Then, they were assigned to one of three conditions. In a "choice" condition, participants could choose the "best" song or the "worst" song. In a "no-choice" condition, participants were assigned to the "best" song, which they were deceptively told was selected randomly. In a second "no-choice" condition, participants were assigned to the "best" song, which they were truthfully told best matched their preferences. Contrast analyses showed that participants were most satisfied when the song was assigned to them, reportedly based on their preferences. Satisfaction was significantly lower in the "choice" condition and marginally lower when the song was allegedly assigned randomly.

In conclusion, by demonstrating that assigned products which match consumers' preferences yield greater satisfaction than self-chosen products, our research challenges the assumption that the freedom to choose always increases satisfaction.

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