

**CONTINGENT CONSUMER RESPONSE TO SELF-CUSTOMIZATION
PROCEDURES: IMPLICATIONS FOR DECISION SATISFACTION AND
CHOICE**

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Abstract

Self-customization is the process by which consumers seek to customize offerings to their own preferences. In this paper, the authors propose that differences in self-customization procedures potentially influence (i) the product configuration favored, (ii) the degree of decision difficulty in product customization, (iii) the degree of satisfaction with the customized option, and (iv) the degree of willingness to purchase. The authors examine these propositions in a series of studies that allowed self-customization in either a by-attribute or a by-alternative method. They show that consumers tend to choose an intermediate (compromise) option significantly more often when they customize a product using the by-attribute rather than the by-alternative method. In addition, the by-attribute customization procedure leads to a lower level of experienced difficulty, greater satisfaction and higher willingness to purchase the customized option than the by-alternative method. Finally, we show that the decrease in experienced difficulty in by-attribute customization method is not solely due to the reduction in information consideration but also due to less explicit tradeoffs among competing characteristics. These results can aid marketing managers in designing mass customization procedures.

“A customized market empowers the consumer with the very thing he will exercise freely: the power to choose.” (Marketing News, October 1, 2006, p. 30)

Companies increasingly have the ability to tailor their products and services to consumers’ preferences. The promise of customization is that by offering consumers exactly what they want, companies will be able to charge a premium for quality, and at the same time will be rewarded with higher customer loyalty (e.g. Pine, Peppers and Rogers 1995). These potential benefits have extended mass customization from retail stores (e.g. Gap, Lands’ End, Staples) to the world’s largest manufacturers (e.g. Dell, General Electric, Nike). Nonetheless, companies are approaching mass customization with caution because it requires that they correctly uncover individual preferences and provide products that fit those preferences. While one strategy to do so is for companies to measure individual preferences and recommend the best match, another alternative is to provide customers with an interface that allows them to customize their own option. The “customize-it-yourself” or self-customization market is growing at a rapid rate in many different categories (Business Week, Dec. 2002; Wall Street Journal, Oct. 2004).

An implicit assumption for the superior value of self-customization is the notion that consumers have inherent preferences (Simonson 2008) and are able to construct the customized offer that best fits their preferences compared to a non-customized offer. This paper focuses on comparing two formats designed to help consumers self-customize a product among a large set of feasible options. We demonstrate that the two most common methods for self-customization can result in a different consumer construction processes as well as different options being chosen as most preferred.

Furthermore, consistent with the established notion that consumers have limited insight into their preferences (Simonson 2005), the construction process of self-

customization may also determine consumers' post-hoc evaluations of the customized option. Specifically, customers' assessment of the customized option is likely to be affected by the ease or difficulty experienced in the process of customizing (e.g. Novemsky, Dhar, Schwarz and Simonson 2007). In this paper, we differentiate between two sources of difficulty associated with the constructed choice. One source arises from choice complexity due to the sheer amount of information that requires processing in order to customize as the number of available options increases. A second source is based on an explicit consideration of between-attribute tradeoffs, that is, the extent to which the customization format makes trade-offs between competing characteristics (or quality attributes) more or less explicit. Regardless of the source of difficulty (i.e., whether it is based on processing large amount of information or based on making fewer effortful competing tradeoffs), we show that the subjective feeling of difficulty during self-customization may affect choice processes and outcomes.

Our findings contribute to the literature in several different ways. Our first contribution is to empirically show that differences in the experience of decision difficulty in the two self-customization modes affect consumers' decision satisfaction and their willingness to purchase the customized option. A second contribution is to show that the decrease in experienced difficulty in by-attribute customization is not solely due to the reduced choice complexity and information load but rather to less explicit tradeoffs among competing characteristics. In the following sections, we describe the extant literature, develop a set of hypotheses and test our predictions using three different studies. We conclude with a discussion of the theoretical and managerial implications of our findings for mass customization.

CONTINGENT RESPONSE TO SELF-CUSTOMIZATION PROCEDURES

Consumers are increasingly seeking to self-customize offerings in accordance to their own preferences. An interesting question that emerges is whether the customization aid that is provided has an influence on the preferred outcome itself. This research question builds on prior findings that show that consumer preferences are often constructed and not just revealed in the process of choice. Thus, if consumers have limited insight into their precise preferences, different self-customization procedures rely on different construction processes, leading potentially to different preferred outcomes (Kramer 2007).

Although there are numerous techniques that may be used to help people customize among the provided options, this paper focuses on the difference between by-attribute and by-alternative self-customization procedures¹. The by-alternative customization method forces consumers to customize by constructing their most preferred option from a set of fully specified products. For example, product customization through Gateway Computers' website allows consumers to compare full model configurations in terms of processor speed, type of application software, memory and drive at once, so that consumers can choose their preferred configuration from fourteen different notebook alternatives. By-alternative customization can also be viewed as a "naive" method of customization because it increases the number of options that consumers must process in order to accommodate a diversity of preferences.

¹ It is important to note the analogy between by-attribute vs. by-alternative customization and self-explicated vs. full profile preference elicitation (Srinivasan and Park 1997; Green and Srinivasan 1990). The self-explicated approach is a compositional measurement task, in which consumers explicitly rate the desirability of various attribute levels and the level of importance of each attribute. The full-profile approach is a decompositional measurement task, in which consumers judge products as a whole by rank-ordering them in terms of purchase likelihood. They are among the most popular preference elicitation tasks (Green and Srinivasan 1990) and show roughly equal predictive validity (Srinivasan and Park 1997).

On the other hand, the attribute-by-attribute customization method (hereafter referred to as by-attribute) lets consumers construct the desired level for each of the product's attributes individually, thereby, customizing the preferred product attribute by attribute. An example of by-attribute customization is the interface used on the Dell Computers website. After consumers choose their preferred level for each individual attribute (e.g. choose the computer's processor speed, then its memory, then its hard drive size and so on), the customized computer is "assembled" and shown to the consumer for final approval prior to ordering. In contrast to by-alternative customization procedures, by-attribute customization methods can accommodate a large number of choice options without a corresponding increase in task complexity for the consumer.

Past research does not provide direct insight into how the construction process that underlies self-customization procedures affect consumers' choice of preferred products. There are two reasons for this: First, much of the research on preference construction has been limited to choice sets involving only two or three options, whereas self-customization is only meaningful in the context of an extensive number of options. Second and more importantly, past research in choice has failed to directly compare the two most widely used methods in the marketplace: by-attribute and by-alternative self-customization procedures².

We posit that different construction processes in the two self-customization procedures will result in a different option that is viewed as most preferred. Specifically,

² A possible exception is the work by Huffman and Kahn (1998). Huffman and Kahn's work focuses on the potential differences in information learning across these two customization modes. As a consequence, they kept total choice complexity fixed by exposing respondents to only a subset of alternatives in the by-alternative condition. In contrast, because the focus of our experiments is on both choice outcomes and the underlying processes driving these outcomes, the respondents are shown the same set of alternatives in both conditions, thereby varying the complexity associated with each customization mode.

we hypothesize that a customization procedure that elicits a preference level for each attribute in isolation will result in an increased preference for intermediate attribute levels. This proposition is based on the notion that when consumers have to make price-quality trade-offs for each attribute in isolation, they may base their choices on the ordinal position of options, favoring the middle position (Drolet, Simonson and Tversky 2003). As a consequence, they perform a series of two-dimensional “compromise effects,” wherein one of the dimensions is price and the other is the particular (quality) attribute being customized. The consequence of performing these series of compromises for each attribute is that final customized option will be more likely to be intermediate than extreme in their attribute values.

Conversely, respondents in the by-alternative customization procedure are confronted with a large number of feasible alternatives. Since consumers have to make multiple-way tradeoffs between different attributes, it is much harder for them to identify these “2-dimensional compromises” and, therefore, the compromise option itself. Conflict theories recognize that choices between attributes elicit negative affect by requiring that the decision maker give up maximizing some valued goals (e.g. Tversky and Shafir 1992). Research suggests that consumers who feel conflicted about making trade-offs among several alternatives are likely to alleviate this discomfort by engaging in conflict reducing heuristics (Nowlis, Kahn and Dhar 2002). For example, respondents who want to avoid making explicit trade-offs often resort to lexicographic decision rules (Dhar 1996) where alternatives that have the highest value on the most important attribute(s) are most preferred. The use of lexicographic rules leads to choices of alternatives with extreme rather than compromise values in at least some of the attributes.

As a consequence, consumers who construct their preferred option using the by-alternative customization procedure will rely on decision processes that favor options with extreme attribute values. Based on this discussion, we hypothesize:

H1: There will be a significant difference in the distribution of preferred options between the two self-customization procedures. Specifically, the by-attribute method will increase preferences for intermediate values and options.

STUDY 1a

Method

Study 1a was designed to test hypothesis H1. The respondents were 86 students at a large west coast university who participated in this experiment in exchange for partial course credit. Study 1a used a between–respondent design where the two experimental conditions differed in the procedure for self-customization. Respondents customized a travel insurance policy using either the by-attribute method (see Figure 1) or the by-alternative method (see Figure 2)³. We selected this stimulus because it was relevant to the participants, modular, and could easily be understood for both customization methods.

– Insert Figure 1 and Figure 2 around here –

The task was self-administered on personal computers. Respondents were told to imagine that they were going to Australia to study for a semester. Because their current insurance plan did not cover dental or medical expenses abroad, they needed to purchase

³ The experiment is available at:

- by alternative http://valenzuela.pagepoint.com/decafr/study1_path1.html
- by attribute http://valenzuela.pagepoint.com/decafr/study1_path2.html

a travel insurance policy for themselves. Respondents then read an explanation of each of the product attributes and were informed of the composition of the most basic insurance policy (for further information, see the Web Appendix). Respondents could construct different insurance policies by choosing one of three attribute levels for each of three attributes, resulting in a total of 27 possible outcomes⁴:

<p><i>Please select the level of <u>deductible</u> you want:</i></p> <p>\$ 500 (Base), \$ 250 (+\$25), \$ 100 (+\$40)</p>	<p><i>Please select the level of <u>maximum coverage</u> you want:</i></p> <p>\$20,000 (Base), \$50,000 (+\$30), \$80,000 (+\$50)</p>	<p><i>Please select the level of <u>Incidental Home Country Rider</u> coverage you want:</i></p> <p>No coverage (Base), 50% of an emergency trip home (\$27), 1 emergency trip home (\$42)</p>
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Attribute levels and ranges were based on typical values found on customization internet sites (e.g. Worldtrips.com). The order of the attributes was counterbalanced across respondents in the attribute-based condition. In the by-alternative approach, alternatives appeared in ascending order by attribute value. After selecting the attribute level or the alternative, respondents viewed their final choice that they could reconfigure if desired (Figure 3).

– Insert Figure 3 around here –

Results

Hypothesis H1 predicted a significant difference in the distribution of preferred options constructed in the two self-customization procedures. Specifically, we predicted an increase in the preference for intermediate attribute levels and options in the by-attribute as compared to the by-alternative customization method. We define an

⁴ Respondents were offered the same full range of possible attribute combinations in both the by-alternative and by-attribute customization methods. There are three reasons for this. First, choice outcomes can only be comparable if consumers view the same set of options in each condition. Second, the number of alternatives presented to subjects in this experiment was well within the accepted range as defined in the conjoint analysis literature (even compared to the reduced full-profile phase in Srinivasan and Park (1997)). Finally, none of the 27 alternatives were dominated.

intermediate option or “compromise choice” as a customized product that contains an intermediate attribute level for at least two of the three attributes (there are a total of 7 out of 27 possible alternatives⁵). Consistent with our predictions, the by-attribute customization procedure led to a compromise choice by 40.5% of respondents whereas the by-alternative customization procedure led to a compromise choice by only 18.4% of respondents. The percentage of compromise choices is significantly higher in the by-attribute than in the by-alternative method ($X^2(1) = 5.152, p < .02$).

Our prediction was based on the notion that there would be stronger preference for the intermediate level on each attribute in the by-attribute customization procedure. Table 1 reports the percentage of respondents who chose the intermediate attribute level for each attribute. Respondents chose an attribute value corresponding to an intermediate level 42.4% of the time in the by-attribute customization method but only 25.1% of the time in the by-alternative customization method. To illustrate one attribute, 51.4% of respondents chose an intermediate health insurance coverage level when using by-attribute customization but only 30.6% of respondents chose this level when using by-alternative customization. Across all three attributes, the choice of intermediate attribute levels is higher in by-attribute than in by-alternative customization ($X^2(1) = 8.46, p < .01$).

– Insert Table 1 around here –

Discussion

⁵ This classifying rule generates seven compromise choices, seven “extreme high” choices, seven “extreme low” choices and six choices with each of the three attributes at a different level. These six choices with each attribute at a different level are also a type of compromise option but are rarely selected – representing less than 5% of choices.

Study 1a's findings support our prediction of a significant difference in the construction of the preferred option between the two self-customization procedures. Particularly, intermediate attribute levels and options are more often favored in the by-attribute compared to the by-alternative customization method.

There are several reasons why manufacturers/retailers should care about whether different self-customization procedures result in different preferred options. Knowing how the customization procedure influences final product choice is key in product line decisions. For example, if a customization procedure induces more extreme choices, then, manufacturers should include profitable product configurations to be located at the extremes. Additionally, knowing whether consumers would compromise more or less in their product choices should allow retailers to stock/ price accordingly. However, a possible limitation of this study is that it involves hypothetical choices. It could be argued that the use of hypothetical products does not create enough decision involvement to ensure the external validity of our findings. Study 1b uses real choices and serves as a replication in a different product context.

STUDY 1b

Method

Study 1b served as a conceptual replication of Study 1a in a real purchase context. Forty-eight students at a Hong Kong university participated in this experiment. Similar to Study 1a, respondents decided on their preferred product configuration using either a by-attribute or a by-alternative self-customization method to customize a pen. At the start of the experiment, participants received HK\$10 in compensation, a portion of which

they could use towards buying the pen they would customize. The most expensive pen cost the full HK\$10. The least expensive pen cost only HK\$4. If they chose an option that was cheaper than HK\$10, they were permitted to keep the balance.

Before starting the customization task, respondents read an explanation of each attribute (for further information, see the Web Appendix). Pens could be customized as follows:

<i>Type of Writing Tip:</i>	<i>Type of Grip:</i>	<i>Type of Design:</i>
<i>Ballpoint (Base), Roller Ball (+HK\$1), Impact Ball (+HK\$2)</i>	<i>Normal Grip (Base), Gel Grip (+HK\$1), Contour Grip (+HK\$2)</i>	<i>Basic Design (Base), Vision Design (+HK\$1), Elite Design (+HK\$2)</i>

Results

The results of this study were consistent with the findings obtained in Study 1a. Participants constructed a compromise option more often in the by-attribute condition (69.2%) than in the by-alternative condition (46.2%; $X^2(1) = 2.84, p < .09$). As before, respondents were more likely to choose the intermediate level for each attribute in the by-attribute customization than in the by-alternative condition. For example, an intermediate type of writing tip was selected by 54.5% of respondents who customized by-attribute but only by 38.5% of respondents who customized using the by-alternative method. Across all three attributes the increase in preference for intermediate attribute levels was significantly higher when respondents customized by-attribute than when they customized by alternative ($X^2(1) = 3.56, p < .05$). The average price paid for a pen was HK\$6.6 across both conditions.

Discussion

Studies 1a and 1b show that, for both hypothetical as well as real tasks, the self-customization procedure affects which products consumers prefer: consumers are more

likely to construct compromise alternatives as their preferred option in by-attribute compared to by-alternative self-customization procedures. This is an important insight both for firms, as it may affect their design of product lines, and for retailers, which may need to adjust their stock and pricing decisions. However, even more important for firms is whether consumers actually purchase the product once it has been self-customized. Not every consumer who initiates product customization actually ends up purchasing the customized product. Even when the self-customized product makes it into the shopping cart online, it may later be abandoned before check out. Specifically, Forrester Research estimates that 53% of people who put items in their online carts leave without buying anything (Wall Street Journal, Nov. 2004).

Study 2, therefore, investigates how differences in the construction process of self-customization procedures may influence the propensity of consumers to look for other options and avoid the purchase of the self-customized option. Specifically, the two self-customization procedures are likely to differ in consumers' ease or difficulty experienced with the customization option. Further, this subjective experience of difficulty that accompanies the construction process of customization can induce inferences about the attractiveness of the customized option. As a result, any increase in the ease or difficulty of arriving at a customized option may have implications in terms of consumers' satisfaction with the option as well as their willingness to purchase the option or to look for other options.

We posit that the two self-customization methods can lead to systematically different degrees of consumers' experienced difficulty. As stated previously, there are two sources of difficulty associated with the choice customization process. First, the two

methods of self-customization differ in terms of choice complexity. Choice complexity relates to the difficulty of processing a large amount of information on the available alternatives. It is important to note that information overload does not only depend on the number of attributes and alternatives. Lurie (2004) argues that the way in which the information is structured also influences the amount of information processing necessary to make a decision and, thus, the level of information overload. In the self-customization context, the amount and the structure of information in by-alternative customization mode requires more processing in order to find a preferred option than in by-attribute customization. Constructing one's customized option using the by-alternative mode is likely to lead to higher subjective experience of difficulty than when using the by-attribute mode because it requires consumers to decompose each alternative into attributes and infer how each attribute level contributes to their overall evaluation (Huffman and Kahn 1998).

A second source of choice difficulty arises from the explicit consideration of tradeoffs among competing characteristics. In contrast to information overload, tradeoff difficulty could be due to consumers' decision conflict arising from having to explicitly make tradeoffs between levels of multiple attributes. The two self-customization modes also differ in tradeoff difficulty due to a difference in the extent to which they focus on explicit tradeoffs among different attributes. Specifically, naive or by-alternative customization requires that the buyer trade off the level of each attribute with the level of every other attribute and decide on attribute composition at once. In contrast, by-attribute customization makes it easier for the buyer to process several alternatives by focusing on simple price-quality tradeoffs for each attribute in isolation. Tradeoffs *between* quality

dimensions in the by-attribute customization are less explicit because they are framed as a sacrifice of money instead of as a loss of other attributes (Beattie and Barlas 1993). As a result, by-attribute customization reduces choice complexity and reduces the difficulty in making tradeoffs among customized alternatives. Thus, the consequence of greater choice complexity and greater tradeoff difficulty in the by-alternative mode will lead to greater subjective experience of difficulty (Dhar 1997; Novemsky et al. 2007) than in the by-attribute mode. Based on these considerations we hypothesize:

H2: By-attribute customization will result in a lower degree of experienced decision difficulty than by-alternative customization.

If, as hypothesized, the two customization procedures are associated with different degrees of experienced decision difficulty, this is likely to have two important implications for purchase behavior. First, it may affect the decision satisfaction with the outcome of the customization procedure, i.e. the customized product itself. Second, it may affect the likelihood that consumers end up purchasing the final product once they have customized it. We present the hypotheses related to these two implications next.

A number of researchers argue that the experience of difficulty accompanying a decision process may influence consumers' evaluation of the decision outcome. For example, Novemsky et al. (2007) show that the subjective experience that accompanies the process of choosing may become an input to the evaluation of the choice itself. In a similar vein, Lieberman and Forster (2006) find that the difficulty of making a decision is used as information about the magnitude of the decision maker's preference. Finally, Fitzsimons (2000) notes that the difficulty of arriving at a choice affected consumers' evaluations of their decision outcome. In other words, a greater feeling of ease

(difficulty) in customizing will lead to greater (lower) satisfaction with the customized offer. Because self-customizing by attribute is predicted to result in lower decision difficulty, we hypothesize that:

H3: By-attribute customization will lead to greater decision satisfaction with the customized option than by-alternative customization.

The feeling of ease or difficulty that occurs during the customization process is also predicted to affect the willingness to purchase the customized option. For example, Novemsky et al. (2007) show that increasing the difficulty of processing by providing the description of alternatives in a difficult-to-read font increased the degree of choice deferral. As discussed earlier, the greater decision difficulty associated with the construction process in by-alternative customization might be used to infer that the customized option is not fully satisfactory and thus, reduce the willingness to make a purchase. Given that by-alternative customization is predicted to result in a greater degree of decision difficulty, we predict that this process should lead to greater choice deferral. As a result we hypothesize:

H4: Participants will be more likely to defer choosing the customized option in the by-alternative than in by-attribute product customization mode.

STUDY 2

Method

Eighty-nine students at a large west coast university participated in this experiment in exchange for partial credit. Similar to Studies 1a and 1b, Study 2 randomly assigned respondents to one of two conditions, which differed in terms of the

customization procedure⁶. Respondents were told that they were to purchase a new laptop for their own use during the upcoming school semester. They were asked to customize the laptop along different attributes. Respondents then read an explanation of each of the attributes and information about the basic choice (for further information, see the Web Appendix). Attribute levels were set similarly to those found at Internet-based customization interfaces, such as Dell.com:

Choose your Processing Speed:	Choose your CD/DVD Configuration:	Choose your HD Capacity:
<i>Pentium III 1.0 Ghz (standard)</i>	<i>CD-Rom (standard)</i>	<i>20 GB (standard)</i>
<i>Pentium III 1.2 Ghz (+\$165)</i>	<i>DVD (+\$95)</i>	<i>30 GB (+\$129)</i>
<i>Pentium III 1.4 Ghz (+\$285)</i>	<i>With DVD/CD-RW player/recorder (+\$254)</i>	<i>40 GB (+\$249)</i>

After completing the customization process, participants also provided their response to the following variables:

Choice difficulty (Dhar & Nowlis 2004): “With regard to customizing the choice, I think the decision was very difficult.” (7 point: disagree/agree scale)

Choice Satisfaction (Fitzsimons 2000): “How satisfied or dissatisfied are you with the laptop that you have customized?” (7 point: very dissatisfied/very satisfied scale)

Purchase Likelihood (Dhar 1997): “If you were in the market for a laptop, what would you do?” (7 point: keep looking/buy this option). “Keep Looking” is the no choice option.

Results

As in Studies 1a and 1b we define compromise choices as those options that contain an intermediate attribute level for at least two out of the three attributes. Consistent with our prior findings, 47.6% of respondents selected the compromise choice when they customized the product by-attribute but only 10.3% of respondents selected

⁶ The experiment is available at:

- by alternative http://valenzuela.pagepoint.com/decafr/study2_path1.html
- by attribute http://valenzuela.pagepoint.com/decafr/study2_path2.html

the compromise choice when they used by-alternative customization ($X^2(1) = 13.54, p < .01$). As before, respondents were more likely to choose intermediate levels in the by-attribute customization procedure (See Table 2). Respondents chose an intermediate attribute level 41.3% of the time in the by-attribute condition compared to 21.4% of the time in the by-alternative condition. Across all three attributes, respondents chose intermediate attribute levels significantly more often in by-attribute customization than in by-alternative customization ($X^2(1) = 11.29, p < .01$). These results replicate those of Studies 1a and 1b.

--Insert Table 2 around here--

Choice Difficulty, Satisfaction and Likelihood of Choice: H2 and H3 predicted that respondents would report greater choice difficulty and lower decision satisfaction for customization by-alternative than for by-attribute. This prediction is supported: choice difficulty is significantly higher in the by-alternative condition ($M = 3.97$) than in the by-attribute condition ($M = 2.83, F(1, 79) = 8.10, p < .001$). We also find that, as predicted, decision satisfaction is higher in by-attribute customization ($M = 5.02$) than in by-alternative customization ($M = 4.33, F(1, 79) = 6.16, p < .01$).

H4 predicted that the likelihood of purchasing the customized option would be higher when respondents used by-attribute than when they used by-alternative customization. As predicted, purchase likelihood was higher when respondents customized their product by-attribute ($M = 4.49$) than by-alternative ($M = 3.37, F(1, 79) = 2.65, p < .10$).

Discussion

Study 2 finds evidence supporting that the construction process involved in by-attribute self-customization leads consumers to experience less decision difficulty, higher decision satisfaction, and a higher willingness to purchase the customized option. As stated above, we posited that there could be two different sources of difficulty experienced in the process of self-customization. The first source is based on the concept of choice complexity associated with processing large amounts of information. The second is based on the concept of tradeoff difficulty, that is, the conflict that arises from making explicit tradeoffs between multiple quality attribute levels. As stated previously, both sources of difficulty are higher for self-customization by alternative. We next consider instances of by-attribute customization that can also increase a focus on competing tradeoffs and hence a similar level of decision satisfaction.

We now propose that tradeoffs *between* quality dimensions in by-attribute customization are not explicit because the tradeoffs are framed as a sacrifice of money but not as a loss of other attributes. Beattie and Barlas (1993) reported consumers' difficulty of trading off alternatives classified either in terms of currencies (e.g., gift certificate, money), commodities (e.g. television, a vacation) or non-commodities (e.g., health, grades). This distinction is similar to other classifications of attributes based on their degree of comparability (e.g., Nowlis and Simonson 1997) or substitutability (e.g., Nowlis, Dhar and Simonson 2008).

It is possible to design by-attribute customization procedures so that they make tradeoffs among competing attributes salient. For example, the web customization procedures of Nikeid.com or Giella.com first let consumers set the price of the product and then choose between its components, thereby forcing them to make explicit trade-

offs between different product features. We propose that the consideration of foregone attributes or options can increase consumers' tradeoff difficulty and the conflict associated with customization. In other words, by-attribute self-customization tasks typically reduce trade-off difficulty because they frame trade-offs as being between each independent quality attribute level and money; in contrast, by-alternative self-customization makes trade-offs more explicit because consumers have to give up a specific quality attribute to get another. Accordingly, if consumers were to encounter a by-attribute self-customization task which made competing quality attribute tradeoffs explicit, then we should observe the same negative effects found in Study 2 for by-alternative self-customization (i.e. enhanced subjective experience of decision difficulty, lower choice satisfaction and more purchase deferral) even in the absence of differences in choice complexity. Thus, we propose that although both sources of difficulty are lower when the customized option is constructed using by-attribute customization, negative task related emotions that arise from the conflict associated with between-attribute tradeoffs (Luce 1998) may be sufficient to override a merely cognitive or complexity-driven advantage inherent in the by-attribute customization task.

The next study tests this important boundary condition for our findings in Studies 1 and 2. In so doing, we illuminate the appropriateness of customization procedures that force consumers to make competing product characteristics explicit. For example, certain self-customization interfaces make consumers first decide on a particular price range and then customize the bundle of features for the desired product within that price range. We now propose that the subjective experience of difficulty increases as tradeoffs

become explicit, and thus, non-satisfaction and choice postponement also increase, even when using a by-attribute self-customization procedure. Specifically, we hypothesize:

H5: By-attribute customization will only result in (i) lower decision difficulty, (ii) higher satisfaction with the choice and (iii) lower choice deferral if tradeoffs between competing attributes do not become explicit.

STUDY 3

Method

Eighty-four students at a large western university participated in this experiment in exchange for partial credit. Study 3 implements a between-subject design with three experimental conditions that differ in terms of the customization procedure. All available alternatives had the same price (\$120) and choices had to be made by sacrificing higher levels on one attribute with a lower level on others. At the beginning of the study, respondents were told that they had to customize a DVD player using three attributes:

- ***Image quality:*** Attribute values ranged from 1 (poor) to 5 (excellent)
- ***Sound quality:*** Attribute values ranged from 1 (poor) to 5 (excellent)
- ***Brand name:*** Sony or RCA (pre-tested to represent a high and low perceived quality brand)

In this study, we developed a new by-attribute customization procedure that made tradeoffs between competing attributes explicit. Figure 4 provides an illustration of this customization interface. Respondents started the customization process by choosing their preferred level for one of the attributes. Once a particular level for that attribute was chosen, options which were no longer available for the other two attributes were graphically crossed out and could no longer be selected. Similarly, after respondents constructed their preferences for the second attribute, options that were no longer

available for the last attribute were crossed out and could no longer be selected. At any time respondents could click on a “clear choices” button and start over with a different selection for their first attribute and so on. A pretest determined that such a graphical interface made attribute tradeoffs among competing alternatives very explicit.

– Insert Figure 4 around here –

The other two customization procedures were the original by-attribute and by-alternative self-customization tasks used in the first two studies. The by-alternative customization condition listed the set of available options (all \$120) in ascending order. The original by-attribute customization condition (considered the control condition) allowed respondent to construct different DVD players by choosing attribute levels for each of the three attributes one by one. However, once the first attribute level was chosen, non-available attribute values for the other two attributes simply did not appear as options, thereby making trade-offs not explicit⁷. Once done, respondents answered the same questions as in Study 2.⁸

Results

As in Study 2, respondents in the original by-attribute customization procedure (relative to the by-alternative customization condition) reported experiencing less choice difficulty ($M= 2.96$ vs. $M=3.86$, $F(1,53) = 3.46$, $p < .07$), higher decision satisfaction ($M= 5.81$ vs. $M= 4.31$, $F(1,53) = 20.82$, $p < .05$) and higher likelihood of purchasing the customized product ($M= 5.38$ vs. $M=3.66$, $F(1,53) = 18.31$, $p < .05$). In line with the hypothesis underlying this study (H5), once competing tradeoffs were more explicit, the experienced decision difficulty in the by-attribute condition did not differ from the by-

⁷ In both by-attribute conditions the order of attributes was counterbalanced.

⁸ The experiment is available (a different condition every click) at <http://valenzuela.pagepoint.com/sepafri/>

alternative condition. Specifically, there was no significant main effect of condition on decision difficulty ($M=3.69$ in the by-attribute condition with explicit tradeoffs vs. $M=3.86$ in the by-alternative condition, $F(1, 56) = 0.110, p > .70$). There was also no significant main effect of condition on level of satisfaction ($F(1, 56) = 0.010, p > .90$) or on likelihood of purchasing the customized product ($F(1, 56) = 0.210, p > .60$). Choice satisfaction in the by-alternative condition ($M=4.31$) was similar to choice satisfaction in the by-attribute with explicit tradeoffs ($M=4.28$). The probability of deferral was also similar ($M=3.66$ vs. 3.86). Thus, we find support for H5.

Discussion

The main purpose of this study was to provide evidence that, although by-attribute customization tasks typically result in lower difficulty based on both choice complexity and a less explicit consideration of tradeoffs, just lowering complexity is not sufficient to derive the benefits of this customization procedure. Our findings suggest that making tradeoffs explicit in the by-attribute customization procedure increases conflict, decreases choice satisfaction, and decreases willingness to purchase, which diminishes the advantage of self-customization using the by-attribute procedure over the by-alternative procedure. In other words, the superiority of by-attribute self-customization comes from limiting the saliency of tradeoffs, which makes choosing among options less conflicting, and, thus, leads to fewer negative-laden emotions.

GENERAL DISCUSSION

The opportunity to self-customize products and services tailored to individual preferences is viewed as an important way to enhance customer relationships and reduce competitive threats. Such an effort requires consumers to have a certain sense of their

own preferences in order to translate them into a custom offering. This poses challenges for self-customization because research in behavioral decision theory suggests that consumers often lack insight into their own preferences and that constructed preferences can vary based on the manner in which they are elicited. Thus, different customization procedures are likely to result in different customized options. Further, recent research suggests that the evaluation of the customized option will also be based in part on the experience of ease or difficulty during the construction process.

The studies in this paper highlight the effect of the two most often used self-customization procedures on consumer choice processes and preferred outcomes: *i)* the by-alternative customization method, which allows consumers to customize by identifying their most preferred option from a set of fully specified products; *ii)* the by-attribute customization method, which lets consumers decide one-by-one the desired level of each product attribute. Studies 1a and 1b show that consumers tend to choose intermediate options significantly more often when they customize a product by-attribute than when they customize by-alternative. This implies that when consumers have to make price-quality trade-offs for each attribute in isolation, they base their choices on the ordinal position of options in the choice set. As a consequence, they perform a series of two-dimensional “compromises” between price and the particular (quality) attribute being customized. On the other hand, respondents in the by-alternative customization procedure have to perform multiple-way tradeoffs between different attributes, which makes it much harder for them to identify these “2-dimensional compromises” and, therefore, the compromise option itself.

Furthermore, the customization task influences the construction of preferences and the subjective experience of making the decision. In particular, Study 2 shows that by-attribute customization reduces choice difficulty, enhances satisfaction and increases the probability that the customized option will actually be purchased. However, the decrease in experience difficulty in by-attribute customization is not solely due to the reduced choice complexity and information overload but is also driven by the fact that tradeoffs among competing characteristics are less explicit. By-attribute self-customization reduces emotional trade-off difficulty because of framing choice as a decision between each particular (quality) attribute level and price. In contrast, by-alternative self-customization makes consumers explicitly give up one specific (quality) attribute for another. Accordingly, if consumers were to encounter a by-attribute self-customization task which made competing (quality) attribute tradeoffs explicit, they should experience the same negative effects found in Study 2 for by-alternative self-customization. In line with this, Study 3 shows that when tradeoffs among attributes are made salient, decision conflict, satisfaction, and willingness to purchase are at a similar level to that associated with by-alternative customization.

Theoretical and Managerial Implications

Our paper has important theoretical implications, which contribute to the study of differences in consumer decision processes. It addresses how participation in customization influences choices. Customization allows consumers to exert control over shopping decisions. Research shows that when consumers perceive they can influence their decision contexts, they tend to focus their attention on implementing rather than evaluating choice options (Chandran and Morwitz's 2005). Similarly our findings

support that when consumers participate in product customization, they use their subjective experience of the difficulty in making a choice as an input to decide whether to actually purchase the customized option or not.

This paper also differentiates between two sources of subjective difficulty (Novemsky et al. 2007; Schwarz 2004): one based on the amount of information that needs to be processed at once (complexity), and the other on how salient trade-offs became (conflict). The choice set presentation format affects trade-off saliency since it determines how trade-offs are framed (either as a sacrifice of money or a loss of other attributes) and how difficult it is to identify the compromise option. Our findings support that negative task related emotions that arise from the conflict associated with facing explicit trade-offs are sufficient to significantly hinder choice satisfaction and justify purchase deferral. More generally, choice deferral effects identified in the literature relate to these two distinct sources of subjective difficulty: difficulty from choice overload (Iyengar and Lepper 2000) as well as difficulty from tradeoff conflict (Dhar 1997).

The findings of this paper also have practical significance to marketers in two different areas. First, the findings help marketers decide how to best ask consumers to engage in product customization. Our results suggest that the response to customized offers is influenced not only by the range of possible options as the best match to customer's revealed preferences but also by the customization process itself. In other words, the consumer's customization construction experience becomes a cue in itself, which affects whether the customized offer is accepted or not. As a consequence, any strategy targeted toward making customization decisions easier would reduce choice dissatisfaction and postponement. Summary evaluations, testimonial accounts of other

consumers' experiences, as well as guidance on decision strategies could help achieve a satisfying customization process that does not resort by default to a compromise option. Additionally, the ease of the consumer customization experience also depends on how tradeoffs are framed. Tradeoffs, which are framed as a choice between quality and price, are emotionally easier and, thus, should be favored. The second area of practical significance for marketers arises from our finding that the customization procedure influences final product choice. This insight is very important for manufacturers' product line decisions: for example, if the self-customization procedure induces more extreme choices (the by-alternative procedure), the most profitable product configurations should be designed to be located at the extremes. Conversely, if the customization procedure induces more compromise choices (the by-attribute procedure), product lines should be designed so as to make the most profitable product configurations become the compromise choice.

Future Research

There are several possible extensions to these findings. We are still far from establishing a general framework of when and why self-customization is effective. For example, the literature has not yet established how by-alternative and by-attribute self-customization procedures compare to having a pre-selected option. Future research should establish boundary conditions that define when allowing for product customization is better than offering a single customized offering. A priori, the possibility of product customization should generally be better than a pre-selected option since it provides consumers with control over their choices and allows for heterogeneity in tastes. However, that does not always seem to be the case. First, extensive

customization may become de-motivating since it may provide too many choices at once (Iyengar and Lepper 2000). Second, the anticipated regret from “miswanting” (i.e. forecasting that a product would be liked, but discovering that it is not), may make consumers prefer a standard product from a customized product (Syam, Krishnamurthy and Hess 2007). Overall, product familiarity and preference strength may play an important role in whether extensive product customization becomes preferable or not .

Future research could also examine whether a hybrid approach between customization and a single product offering might be optimal. For example, companies implementing product customization could request information about the consumer’s past purchases and individual usage characteristics before recommending a base option that could be further altered (e.g., P&G’s coffee customization site Personalblends.com recommends an optimal product to the consumer based on his/her expressed taste preferences). In such a case, consumers might exhibit the status quo bias, anchor on the base option, and not arrive at the same final product as they might have, had they not seen the base option. However, consumers might also be more satisfied with the process if, due to the status quo bias, tradeoffs were to be less painful to them.⁹

Finally, future research could investigate how individual characteristics, such as consumers’ cultural and personality differences, affect consumers’ tendencies to accept offers that are (or are not) customized to their individual preferences. For example, Kramer, Spolter and Thakkar (2007) provide evidence that individually elicited preferences are not universally important for product customization. Specifically, individuals who exhibit interdependent or collectivistic tendencies tend to be more receptive to product customization based on the collective preferences of relevant in-

⁹ We would like to thank an anonymous referee for suggesting some of these avenues for research.

groups. In this vein, it is interesting to note that the Lenovo PC customization site allows consumers to choose which kind of self-customization procedure they prefer before proceeding with actual self-customization. More generally, we think that further research is needed into factors that determine consumer sensitivity to available self-customization procedures in the marketplace.

Table 1

Study 1 - Percentage of Respondents Choosing the Compromise by Customization Procedure.

<i>Options</i>	<i>By Alternative</i>	<i>By Attribute</i>
Deductible (Compromise = \$250)	30.6	43.2 ¹
Coverage (Compromise = \$50,000)	30.6	51.4 ²
Rider (Compromise = 50% coverage)	14.3	32.4 ³

¹X²(1) = 1.454, *p* > .20

²X²(1) = 3.796, *p* < .05

³X²(1) = 4.012, *p* < .05

Table 2

Study 2 - Percentage of Respondents Choosing the Compromise by Customization Procedure.

<i>Options</i>	<i>By Alternative</i>	<i>By Attribute</i>
Speed (Compromise = 1.2 Ghz)	33.3	52.4 ¹
Storage (Compromise = DVD)	2.6	14.3 ²
Hard drive (Compromise = 30GB)	28.2	57.1 ³

¹ X 2 (1) = 3.014, p< .08

² X 2 (1) = 3.905, p< .05

³ X 2 (1) = 7.026, p< .01

Figure 1:
Example of Customization Interface in by Attribute condition

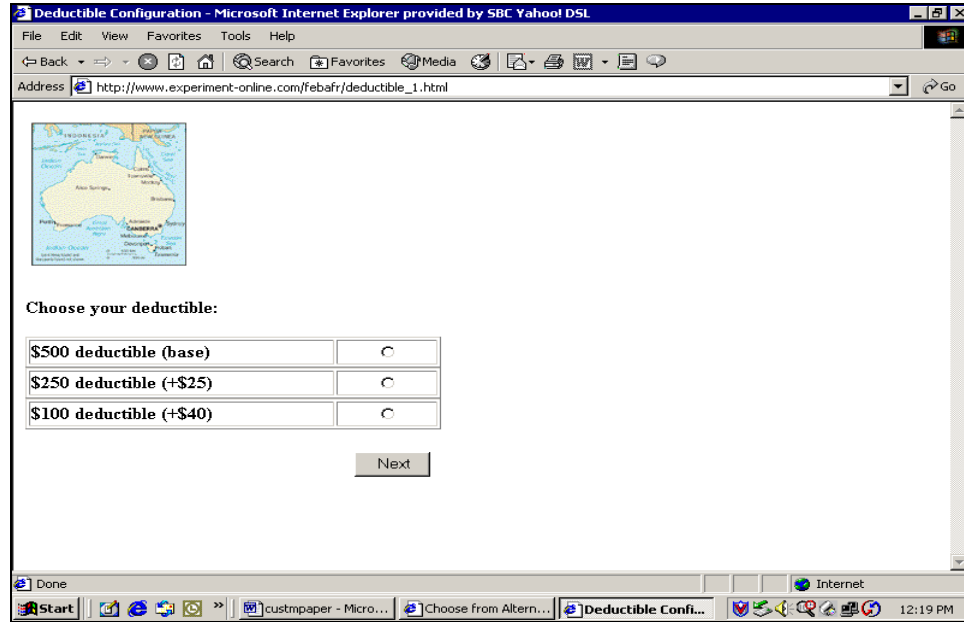


Figure 2:
Example of Customization Interface in by Alternative condition (partial)

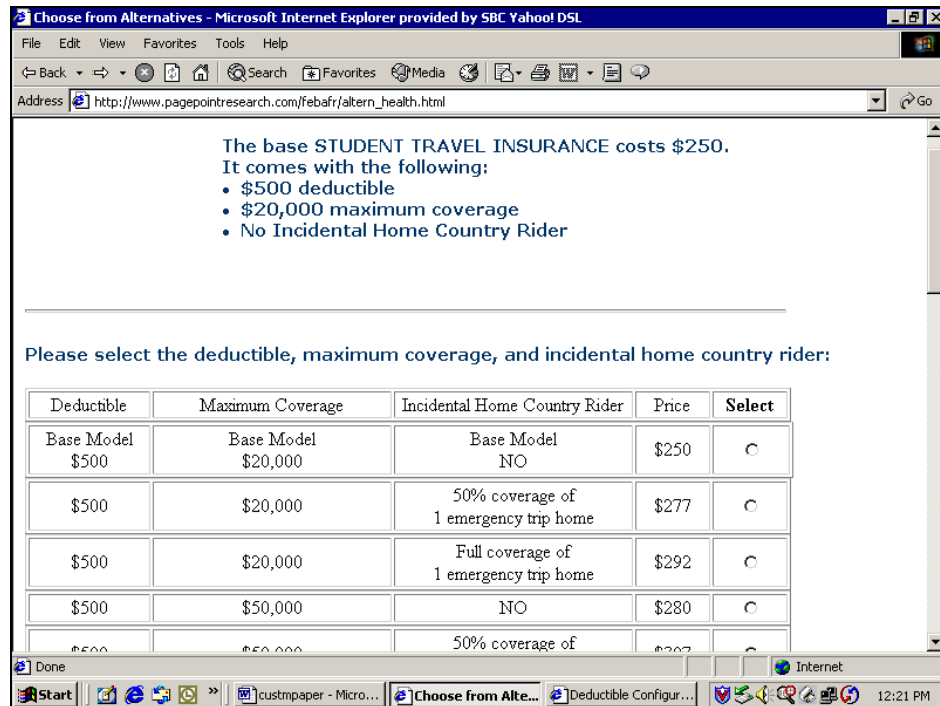


Figure 3:
Example of Interface with Final Choice

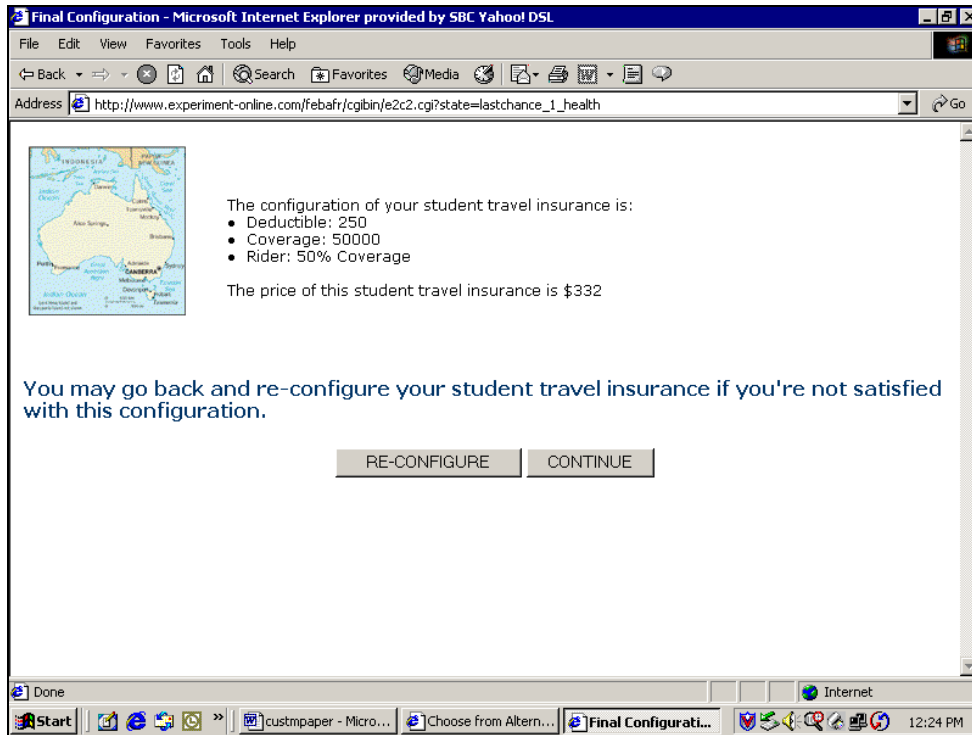
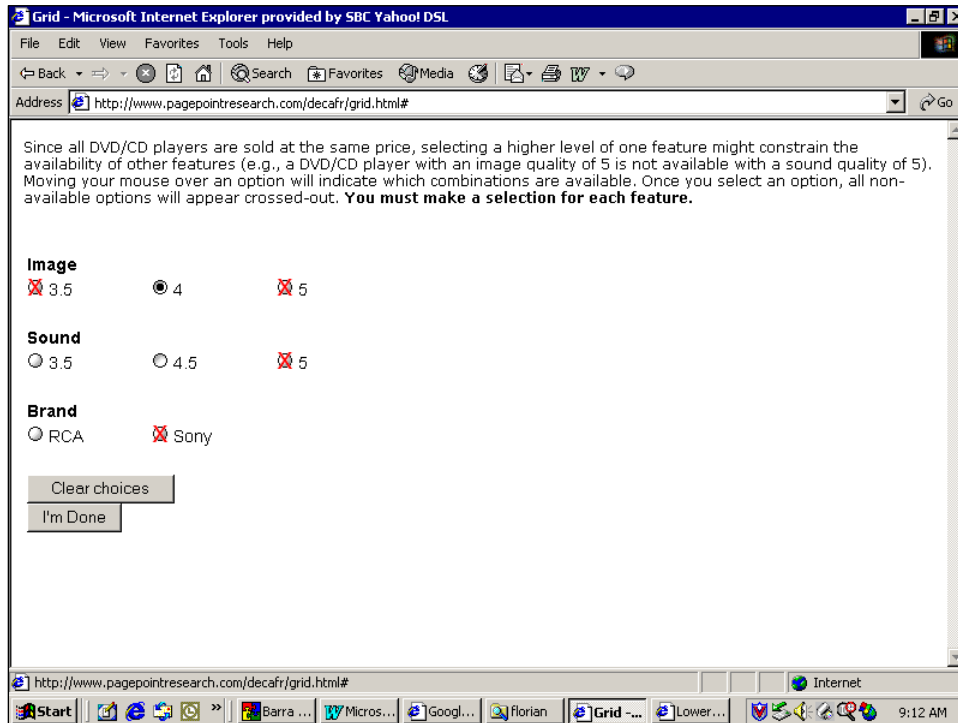


Figure 4:
Example of Customization Interface in the Explicit Tradeoffs Condition: DVD/CD Player



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