

# I Want Products My Own Way, But Which Way? The Effects of Different Product Categories and Cues on Customer Responses to Web-based Customizations

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## Abstract

Mass customization is a strategy that has been adopted by companies to tailor their products in order to match customer needs more precisely. Therefore, to fully capture the value of mass customization, it is crucial to explore how customers react to mass customization. In previous studies, an implied premise has been that consumers are keen to embrace customized products, and this assumption has also been treated by firms as a prerequisite for successful mass customization strategies. However, an undesirable complexity may result from difficult configuration processes that may intimidate and confuse some customers. Hence, this study explores strategies that marketers can employ to facilitate the customization process. Specifically, this study investigates how to enhance customer satisfaction and purchase decision toward customized products by providing cues compatible with the product category. It is hypothesized that for search products, customers rely more on intrinsic cues when making configuration decisions. On the other hand, for experience products, customers perceive extrinsic cues to be more valuable in assisting them to make configuration decisions. The results suggest that consumers tend to respond more favorably toward customized search products when intrinsic cues are provided than when extrinsic or irrelevant ones are provided. In contrast, when customizing experience products, customers tend to depend more on extrinsic cues than on intrinsic or irrelevant ones.

## Introduction

MASS CUSTOMIZATION, empowered by flexible computer-aided manufacturing systems, can provide customers tailor-made products and services with near mass-production efficiency.<sup>1</sup> Many companies are increasing their reliance on such a strategy in order to match customer needs more precisely.<sup>2</sup> However, despite the initial enthusiasm associated with mass customization, consumers can be overwhelmed by its complexity when facing a series of difficult choices. Huffman and Kahn coined the term “mass confusion” to delineate a situation in which an excessive variety of potential choices in mass customization results in a high level of perceived complexity and/or information overload, which tends to overwhelm and dissatisfy customers.<sup>3</sup> However, only a limited amount of research has focused on how to mitigate the confusion experienced by customers through the employment of decision aids and, in turn, to elevate customer satisfaction. Therefore, this paper explores the effect of potentially constructive tactics, such as information pro-

vision, that firms can employ to augment customer satisfaction and the purchase intention of customized products.

Mass confusion, mainly triggered by complicated decision-making configurations, can be mitigated if firms can proffer helpful information, such as product specifications and/or samples, to reduce perceived uncertainty and complexity. This issue is particularly relevant in online shopping environments where e-tailers are well equipped to provide information in a more efficient and interactive fashion.<sup>4,5</sup> Hence, if e-tailers can provide customers with information that facilitates decision making, customers can better handle difficult choices in customization than they can in the traditional settings. However, the effect of information on customer configuration choices associated with Web-based customization is an underresearched area, and many questions have remained unanswered. For example, do all kinds of information carry the same weight in the creation of customer satisfaction? Do customers rely on different types of cues/information when assessing products in different categories? Prior studies involving product classification schemes

(search versus experience products)<sup>6,7</sup> have found that diversity in the types of information can have effects on product judgments. For example, for experience products, extrinsic cues provided by other consumers (such as users' ratings, discussions, and comments) tend to carry more weight in customer product evaluations than do intrinsic cues, such as color, size, style, specification, and function.<sup>8,9</sup> For search products, however, customers are more likely to rely on information about product specifications from retailer Web sites when forming their decisions.<sup>8,9</sup> Based on previous research, this study investigates further the effectiveness of various cue types in decisions concerning configuration across different product categories. It is proposed in this paper that compatible cues can improve customer evaluations of customized offerings to a greater degree than do less compatible ones.

## Literature Review and Hypotheses

### *Perceived complexity*

Mass confusion, which creates barriers to customers in customization tasks through difficult decision-making processes, mainly results from perceived complexity.<sup>3</sup> For example, when customers do not have sufficient knowledge<sup>3</sup> or well-structured preferences<sup>10,11</sup> to select the "best fit" product on their own, they may perceive the configuration process to be too complex and difficult. Therefore, strategies reducing perceived complexity need to be explored in order to facilitate the customization process for customers with limited product knowledge. One way to achieve this goal is to facilitate the preference identification process. In a customizing task, when customers can better compare attributes and identify the most preferred choice for all the customizable attributes, the phenomenon of mass confusion can conceivably be alleviated or eliminated.<sup>3</sup>

### *Factors reducing perceived complexity*

**Information presentation format.** In an effort to reduce the perceived complexity in mass customization,<sup>3</sup> Huffman and Kahn have demonstrated that a proper format for the presentation of information (attribute-based rather than alternative-based) can facilitate the formation of customer preference. When information about a product is presented in the attribute-based format, customers tend to be more willing to make configuration choices and feel more satisfied with the customization process. On the other hand, when information about the product options are presented by alternative, customers perceive more complexity in deciding their preference and feel less satisfied with the customized product because it is more difficult to process information involving multiple attributes simultaneously.<sup>3</sup>

**Provision of information.** While previous research efforts have aimed at understanding how information can be organized differently to facilitate the customization process, little has been documented in terms of how a variety of information provided by firms can affect customer configuration choices. One exception by Piller and his colleagues proposes that knowledge shared among customers in virtual communities can facilitate customer interaction with the customization system.<sup>12</sup> For example, customers in LEGO User

Group Network can create their own works by using the configuration system and at the same time can communicate with other customers in the community to exchange opinions or even to create joint designs. Therefore, they suggest that by implementing a virtual community for customization, firms can encourage customers to communicate with each other to share their customization experiences, recommend product options, inspire each other with creative ideas, and eventually to feel more confident in customizing their own products.<sup>12</sup> Another e-commerce research also maintained that word-of-mouth recommendation can significantly reduce decision difficulty. For example, when choosing a restaurant, customers who receive recommendations with high credibility notably reduce their search time and number of searches.<sup>13</sup> Such findings highlight that the provision of information and/or decision-making heuristics can make purchase decisions easier for consumers. However, it remains unknown if all information helps customers to specify their preferences in the same way.

### *Compatibility between types of cues and product categories*

**Varied reliance on information across product categories.** Previous marketing literature<sup>6,7</sup> has ascertained that the information sources customers rely on to evaluate product quality prior to purchase can have differential impacts for search and experience products.<sup>14,15</sup> Search products are those for which sufficient information can be acquired through objective product descriptions (such as ingredients and contents appearing on product labels) from firms prior to purchase.<sup>7,16</sup> On the other hand, experience products, which are products whose quality can only be determined after purchase,<sup>7</sup> tend to cause a greater uncertainty about product quality and, hence, usually necessitate further information acquisition.<sup>9,14,17</sup> The difficulty of evaluating information derived directly from product-inherent characteristics tends to prompt customers to gather additional information from other reliable sources, such as recommendation from friends.<sup>9</sup> For example, perfume scent is difficult to communicate using generic terms such as ingredient descriptions. Consequently, customers are more likely to draw on subjective comments of existing consumers to facilitate their decision making. This varied perceived importance of information across the search-experience classification scheme has been ascertained by Bei and her colleagues.<sup>9</sup> When customers compare search product alternatives, they tend to trust their own judgments of product specifications provided by firms.<sup>9</sup> In contrast, the increasing difficulty in assessing objective product descriptions for experience products make opinions from other customers a more important source of information.<sup>9</sup> Therefore, it can be presumed that differences in the effectiveness of information in assisting customers to make configuration decisions across product categories is rooted in the varied perceived importance of information across search and experience products.<sup>a</sup>

**Intrinsic vs. extrinsic cues and predictive and confidence values.** The information that customers can acquire to form quality judgments prior to purchase can be classified into two broad categories: intrinsic and extrinsic cues.<sup>18</sup> Intrinsic cues represent information concerning a product itself, such as in-

ingredients or properties, which cannot be changed without altering the inherent characteristics of a product.<sup>18</sup> By contrast, extrinsic cues are nonphysical product characteristics, such as brand, country of origin, and corporate image.<sup>18,19</sup> The cues (intrinsic versus extrinsic) that are relied on more for quality judgment by consumers are determined by their predictive and confidence values. Predictive value is defined as the extent to which a consumer perceives or believes that the cue is appropriately representative of product quality. Confidence value refers to the extent to which consumers are able to judge a cue precisely.<sup>18</sup> The attributes of search products such as color, style, specification, and function, can usually be described in detail objectively. In such a case, customers can make judgments relying more on intrinsic cues, which reflect objective product characteristics.<sup>20–22</sup> In other words, intrinsic cues have higher predictive and confidence values for search products. In contrast, many crucial attributes of experience products (for example, scent for perfumes) are difficult to depict using specific and universally quantifiable terms. Therefore, customers prefer to rely more on extrinsic cues such as brand,<sup>19</sup> country of origin,<sup>23</sup> expert reviews,<sup>24</sup> word of mouth,<sup>25</sup> and price and warranty.<sup>26</sup> This preference can be attributed to two major reasons. First, customers might perceive intrinsic product descriptions to be not well representative of product quality. For example, for an experience product, such as dinner at a new restaurant, it is difficult to know how the food tastes simply based on the ingredients listed on the menu; therefore, customers may be more reliant on ratings, opinions, and discussions from other customers when forming their own judgments.<sup>9,13</sup> Second, even when intrinsic cues are well representative of product quality, customers may not be confident in their ability or knowledge to judge product quality based on them because jargon is often involved.<sup>18,27</sup> Take automobiles, for example.<sup>7</sup> When assessing vehicle reliability, model reputation, and driving characteristics, customers may rely more on personal evaluations gathered from friends, online third parties, and online chat rooms.<sup>28</sup> This may be due to customers' limited confidence in evaluating the products based on the intrinsic cues provided. In summary, the compatibility between search products and intrinsic cues is postulated to be higher than that with extrinsic cues; on the other hand, extrinsic cues are more compatible with experience products than with intrinsic cues.

Effective cues can provide good reasons to purchase products/services for customers whose preferences are too vague or too varied to identify a "best option" from the offered choice set.<sup>11</sup> Grounded on the assumption that people may seek reasons to justify their choices to themselves,<sup>10</sup> effective reasons are likely to reduce uncertainty perceived by consumers, particularly when they are overwhelmed by an enormous number of choices, which involve difficult tradeoffs. For example, previous research in cyberspace commerce has averred that the extent of product information provided<sup>29</sup> and decision-making supports, such as frequently asked questions (FAQs) and links to product comparison Web sites,<sup>30</sup> are antecedents of consumer satisfaction. Higher satisfaction can be achieved when customers can make better choices more efficiently with the support of these decision-making aids.<sup>30</sup> Compatible cues are likely to possess higher predictive and confidence values and thus serve as better decision-making supports.

In Web-based customization configuration processes, the unique customer value is created by a series of configuration choices that allow customers to tailor the products. As such, consumers may need more reasons to justify their large number of decisions. Therefore, the impact of compatibility between cues and product categories can be more substantial in the context of Web-based customization than in standard online shopping. Granted, customers are likely to experience greater satisfaction with a product when more helpful reasons are provided in the customization process.<sup>10</sup> Conceivably, customization is likely to result in greater satisfaction when compatible cues are provided. Hence, the following hypotheses can be formulated.

**H1: The compatibility between product category and cue type has a greater salutary effect on customer satisfaction with the product in the customization context than in the no-customization context.**

**H1a: For search products, customization would have a stronger salutary effect on customer satisfaction when intrinsic cues are provided than when less compatible cues (extrinsic and irrelevant cues) are provided.**

**H1b: For experience products, customization would have a stronger salutary effect on customer satisfaction when extrinsic cues are provided than when less compatible cues (intrinsic and irrelevant cues) are provided.**

Based on the attitude–behavior linkage,<sup>31</sup> customers who are satisfied with a product are more likely to repurchase it. By the same token, customers who are satisfied with their configuration decisions may demonstrate a higher purchase intention toward customized products. In a study of park and recreation services, both visitor satisfaction and service quality were found to have a direct influence on the intention to revisit.<sup>32</sup> In an empirical study of a Web-based grocery shop in Finland, the level of consumer satisfaction positively influences the purchases amount.<sup>33</sup> Similarly, the extent to which a customer is willing to purchase a customized product should also be influenced by the compatibility between cues and product categories because compatibility is a determinant of customer satisfaction and should be highly related to purchase intention.

Although few empirical studies have assessed the influence of the compatibility between cues and product categories on purchase intention in the context of customization, extrinsic cues, price, brand, and store name have been reported to increase customer willingness to buy a calculator or stereo headset player in a standard online shopping environment.<sup>34</sup> Recent research conducted by Chu et. al examined the effects of extrinsic cues in the context of online shopping and suggests that manufacturer and retailer brands have positive effects on the purchase intention of computer monitors.<sup>35</sup> Although there is no substantial amount of evidence, a potential relationship between the compatibility of cues and purchase intention is likely to exist, according to the foregoing discussion. Thus, when more compatible cues are presented along with each product attribute option, customers are likely to have higher purchase intentions toward the customized products, as they are more likely to be satisfied with their choices in various attributes and consequently show a higher willingness to buy the final products.

Moreover, as mentioned in the previous section, the iterative decision process of customization highlighted the importance of compatibility between cues and product categories. The positive effect of customization on consumer purchase intention is likely to be accentuated when cues provided are compatible with the product categories. Thus, the following hypotheses are advanced:

**H2: The compatibility between product category and cue type has a greater salutary effect on customer purchase intention of a product in the customization context than in the no-customization context.**

**H2a: For search products, customization would have a stronger salutary effect on purchase intention when intrinsic cues are provided than when other less compatible cues (extrinsic and irrelevant cues) are provided.**

**H2b: For experience products, customization would have a stronger salutary effect on purchase intention when extrinsic cues are provided than when other less compatible cues (intrinsic and irrelevant cues) are provided.**

## Methods

The sample was composed of 380 participants, comprising both undergraduate and graduate students. Most of the sample was female (67.6%), and most (95.3%) were between 19 and 28 years old. More than 34% of the sample spent 5 to 8 hours a day online and were therefore familiar with online surfing. In terms of the frequency of shopping online, 96.3% of the respondents indicated that they had previous online shopping experience, and 35.3% of them shopped online more than six times each half year. Most respondents were online shoppers and a very suitable target audience for Web-based mass customization products.

A  $2 \times 2 \times 3$  (customization and no-customization  $\times$  search and experience products  $\times$  intrinsic, extrinsic and irrelevant cues) between-participants factorial design was employed in this study. Three hundred eighty Taiwanese were randomly assigned to each of the 12 experimental conditions in this study. Each participant was instructed to explore one of the 12 Web sites constructed specifically for this study. Participants assigned to the customization group were instructed to browse the product customization Web page and asked to engage in a customizing task of either an MP3 player or a bottle of perfume. Participants in the no-customization group browsed the product Web page in the manner of standard online shopping. Following the paradigm in previous choice studies,<sup>36</sup> a yoked control group design was employed. In the control group, each participant in the no-customization group was yoked to a participant in the experimental condition. That is, each participant in the no-customization group was given a product that his or her counterpart in the experimental group configured. This method was utilized to ensure that the only difference between experimental and control groups was the opportunity to customize a product. After the customization task, all participants were asked to complete a questionnaire concerning important variables in this study, such as satisfaction and purchase intention.

An online retailing Web site, e-commerce.com, was fabricated to test the hypotheses formulated earlier. On the Web

page, participants were provided either an MP3 player or a bottle of perfume to customize. Each product had five attributes, and every attribute had three options from which customers could choose, making a total of 243 possible combinations ( $3 \times 3 \times 3 \times 3 \times 3 = 243$ ). The selection of an MP3 player and a perfume (target stimuli) as search and experience products, respectively, was based on a pretest of 32 participants. The results of pretest showed no significant difference in terms of customer familiarity with the target products, an MP3 player for search product and a perfume for experience product ( $t = 0.658$ , *ns*,  $p = 0.521$ ).<sup>b</sup> Furthermore, from the same set of data, three key attributes were identified for each product. For the MP3 player, earphones, control panel type, and USB plug-in type were selected as the key customizable attributes. In the case of the perfume, the three key attributes were the top, middle, and base notes, which unfold one by one over time, constituting the consonant chord of the scent. The manipulation checks for the search/experience products showed expected and desirable results: an MP3 player was rated as a search product ( $t(189) = 7.84$ ;  $p < 0.001$ ), and the perfume was perceived as a product that can only be evaluated after purchase ( $t(189) = 24.48$ ;  $p < 0.001$ ). The intrinsic cues of each product were collected from various online shopping malls and also pretested to ensure sufficient realism ( $t(63) = 6.03$ ;  $p < 0.001$ ). With regard to extrinsic cues, three Taiwanese celebrities of equal attractiveness ( $F(2, 12) = 0.46$ ;  $p = 0.64$ ) and trustworthiness ( $F(2, 12) = 0.12$ ,  $p = .89$ ) among the target audience, Rainie Yang (Cheng-Lin Yang), Jasmine Leong (Ching-Ju Leong), and Ariel Lin (Yi-Chen Lin), were chosen as the endorsers for both products in order to control the effect of celebrity influence. For all three attributes, each celebrity endorsed one specific option. The final group of participants, treated as the control group, was presented with irrelevant cues. Such cues were neither intrinsic, containing information related to the attribute performance per se, nor extrinsic, including information about celebrity endorsements for individual options of the product attributes. Rather, they comprised information about general product usage, such as MP3 player maintenance instructions or perfume usage tips. This type of information did not contain details that could be utilized to better identify and select configuration choices. The control group was presented with such information to ensure each participant received the same amount of information so that the only difference among these groups was the type of cues they received and not the amount of information presented. Additionally, all the information presented was controlled at a fixed amount ( $F(2, 374) = 0.77$ ;  $p = 0.46$ ) and at a same level of argument strength ( $F(2, 374) = 0.28$ ;  $p = 0.76$ ) across different experimental conditions in order to remove the effect information amount.

All the 7-point Likert scale measurement items were adapted from previous studies. The satisfaction measures used by Spreng et al.<sup>37</sup> were anchored as *very satisfied/very dissatisfied*, *very pleased/very displeased*, *contented/frustrated*, and *delighted/terrible*. For purchase intention measures, participants were asked to rate the extent to which they wanted to buy the final customized product on a three-item scale by Putrevu and Lord.<sup>38</sup> All the Cronbach's alphas exceeded the cutoff point of 0.7. To ensure convergent and discriminant validity of these measures, principal component analyses using varimax rotation were performed. The analyses pro-

duced reasonable factor structures to support convergent validity with item loadings higher than 0.6 on the appropriate dimensions, and average variance explained greater than 60%. For the test of discriminant validity, the criteria proposed by Gaski and Nevin<sup>39</sup> were used. The results suggested discriminant validity was proper because the correlations among measures were lower than alpha coefficients of themselves.

## Results

A multivariate analysis of variance (MANOVA) was used to assess the interactive effects among customization, cue types, and product categories on two dependent variables: satisfaction and purchase intention. There were significant multivariate main effects for customization,  $F(2, 367) = 21.301$ , Wilks's  $\lambda = 0.896$ ,  $p < 0.001$ , and cues,  $F(4, 734) = 2.972$ , Wilks's  $\lambda = 0.968$ ,  $p < 0.05$ . The customization conditions resulted in more favorable customer responses than no-customization conditions,  $F(2, 377) = 19.18$ , Wilks's  $\lambda = 0.908$ ,  $p < 0.001$ ; satisfaction:  $M_C = 4.71$  vs.  $M_N = 4.14$ ,  $F(1, 378) = 20.83$ ,  $p < 0.001$ ; purchase intention:  $M_C = 4.52$  vs.  $M_N = 3.70$ ,  $F(1, 378) = 37.43$ ,  $p < 0.001$ . The main effect of cues is also significant, which suggest cues had different effects on dependent variables,  $F(4, 752) = 2.41$ , Wilks's  $\lambda = 0.975$ ,  $p < 0.05$ . However, the main effects were qualified by higher-order interactions.

A two-way multivariate interaction effect was found for customization and cues,  $F(4, 734) = 3.631$ , Wilks's  $\lambda = 0.962$ ,  $p < 0.01$ . The interaction between customization and cues was significant for satisfaction and purchase intention. MANOVA contrast tests revealed that cues induced more favorable responses in the customization group than did no-customization group,  $F(4, 746) = 3.417$ , Wilks's  $\lambda = 0.964$ ,  $p < 0.01$ . In the customization condition, participants expressed higher levels of satisfaction when intrinsic or extrinsic cues were provided than when irrelevant cues were provided, satisfaction:  $M_{INTRINSIC} = 4.97$ ,  $M_{EXTRINSIC} = 4.92$ ,  $M_{IRRELEVANT} = 4.23$ ,  $F(2, 374) = 5.50$ ,  $p < 0.01$ . For dependent variable purchase intention, participants expressed greater purchase intention when intrinsic or extrinsic cues were provided than when irrelevant cues were provided, purchase intention:  $M_{INTRINSIC} = 4.82$ ,  $M_{EXTRINSIC} = 4.79$ ,  $M_{IRRELEVANT} = 3.94$ ,  $F(2, 374) = 5.52$ ,  $p < 0.01$ . This two-way interaction effect, however, was qualified by the three-way interaction, which suggested that the definition of "compatible cues" is contingent upon the product category the cues were associated with.

Another two-way interaction between cues and product categories was also found,  $F(4, 734) = 5.04$ , Wilks's  $\lambda = 0.947$ ,  $p < 0.01$ . MANOVA contrast tests further revealed that the effect cues was contingent upon product category in both customization and non-customization groups,  $F(4, 746) = 4.593$ , Wilks's  $\lambda = 0.953$ ,  $p < 0.001$ . For MP3, regardless whether participants had the opportunity to customize, when they were provided with intrinsic cues, they expressed higher satisfaction and purchase intention than when other cues were provided, satisfaction:  $M_{INTRINSIC} = 5.02$ ,  $M_{EXTRINSIC} = 4.18$ ,  $M_{IRRELEVANT} = 4.27$ ,  $F(2, 187) = 8.75$ ,  $p < 0.001$ ; purchase intention:  $M_{INTRINSIC} = 4.69$ ,  $M_{EXTRINSIC} = 4.08$ ,  $M_{IRRELEVANT} = 3.92$ ,  $F(2, 187) = 5.97$ ,  $p < 0.01$ . On the other hand, extrinsic cues resulted in higher satisfaction with

perfume than did intrinsic or irrelevant cues, satisfaction:  $M_{INTRINSIC} = 4.22$ ,  $M_{EXTRINSIC} = 4.69$ ,  $M_{IRRELEVANT} = 4.17$ ,  $F(2, 187) = 3.75$ ,  $p < 0.05$ . For purchase intention, extrinsic cues was able to achieve a higher level of customer satisfaction than irrelevant cues, purchase intention:  $M_{EXTRINSIC} = 4.26$ ,  $M_{IRRELEVANT} = 3.73$ ,  $p < 0.05$ . Nevertheless, the two-way interaction mentioned above was qualified by the three-way interaction, suggesting that the augmented satisfaction due to compatible cues prevailed for customization groups rather than non-customization groups.

A three-way interaction among customization, cues, and product categories was found to be significant,  $F(4, 734) = 2.628$ , Wilks's  $\lambda = 0.972$ ,  $p < 0.05$ . As a consequence, the data were analyzed with MANOVA contrasts<sup>40</sup> to explore the nature of these interactions. H1 and H2 predict that compatibility between cues and product categories have a stronger effect on customer satisfaction and purchase intention of a product in the customization context than in the no-customization context. To examine the mean difference of both dependent variables between customization and no-customization groups, planned contrast tests were performed. Supporting H1 and H2, the results of MANOVA contrasts revealed that for the search product, participants in the customization group had significantly more favorable ratings of satisfaction and purchase intention,  $F(4, 182) = 4.905$ , Wilks's  $\lambda = 0.815$ ,  $p < 0.001$ . In particular, the augmented satisfaction with and higher purchase intention of the product due to customization with compatible cues presented (i.e., intrinsic cues) were larger than that resulting from customization with less well-matched cues (i.e., extrinsic and irrelevant cues), difference in satisfaction:  $M_{INTRINSIC} = 1.45$ ,  $M_{EXTRINSIC} = 0.53$ ,  $M_{IRRELEVANT} = -0.17$ ,  $F(2, 92) = 7.482$ ,  $p < 0.001$ ; difference in purchase intention:  $M_{INTRINSIC} = 1.83$ ,  $M_{EXTRINSIC} = 0.55$ ,  $M_{IRRELEVANT} = 0.16$ ,  $F(2, 92) = 7.732$ ,  $p < 0.001$ . For the experience product, the same pattern was observed,  $F(4, 182) = 4.492$ , Wilks's  $\lambda = 0.828$ ,  $p < 0.01$ . Elevated satisfaction with and higher purchase intention of experience products due to customization were higher when extrinsic cues were provided than when other less compatible cues were provided, difference in satisfaction:  $M_{INTRINSIC} = 0.58$ ,  $M_{EXTRINSIC} = 1.41$ ,  $M_{IRRELEVANT} = 0.20$ ,  $F(2, 92) = 5.277$ ,  $p < 0.01$ ; difference in purchase intention:  $M_{INTRINSIC} = 0.69$ ,  $M_{EXTRINSIC} = 1.92$ ,  $M_{IRRELEVANT} = 0.28$ ,  $F(2, 92) = 9.457$ ,  $p < 0.001$ . To sum up, all the hypotheses formulated in this study section were supported.

## Conclusions and Discussions

The objective of this study is to contribute empirical evidence to mass customization literature, which at present provides little or no insight concerning how customers react within the customization process.<sup>12</sup> The results showed that customization can lead to a higher level of customer satisfaction when cues compatible with product categories were provided. More specifically, for search products, customization achieved the highest augmentation of purchase intentions and satisfaction with the final products when intrinsic cues were provided. On the other hand, for experience products, customization led to the most positive responses on both dependent variables when extrinsic cues are proffered.

The findings that compatible cues are more effective in enhancing customer satisfaction and purchase intention are

consistent with the prediction of cue utilization theory.<sup>18</sup> While evaluating search products, customers tend to depend on intrinsic cues as quality indicators because the linkage between quality and intrinsic cues is more salient than for extrinsic cues.<sup>8</sup> For instance, storage size is more important as a purchasing criterion than an endorsement when a flash drive is involved. Past research regarding customer information search behaviors in cyberspace<sup>9</sup> reveals that when making purchase decisions for search products, customers tend to depend more on so-called hard data (color, style, specification, size, model, and function) provided by firms. Therefore, firms should include more information of this kind in order to facilitate product searches.<sup>16</sup> On the other hand, for experience products, intrinsic cues, such as descriptions of attribute performance derived directly from the products, are more difficult for customers to use and have lower predictive and confidence values. Therefore, in this situation, customers tend to rely more on extrinsic cues for assistance, such as manufacturer reputation<sup>27</sup> and recommendations from other customers.<sup>9</sup> This is consistent with previous findings<sup>9</sup> suggesting that while engaging in online information searches for experience products, customers perceive so-called soft data (customer opinion, rating, and discussion) to be more important than information provided by firms.<sup>9</sup> The results also appear to be in accordance with the findings of Jain and Posavac, which aver that endorsements from credible celebrities are particularly effective in augmenting the impact of advertising claims for experience qualities.<sup>41</sup> Celebrity endorsements as extrinsic cues create bonds between themselves and product quality, providing more heuristic evaluations for consumers with which to support their configuration choices. For example, customers may judge a particular scent by the attractiveness of the celebrity endorsing it and thereby infer the scent is more pleasant and more suitable for them.

Although not explicitly stated in a hypothesis, it was found that customization significantly enhanced both customer satisfaction and purchase intention across all conditions of different cues and product categories. In other words, the phenomenon of mass confusion, which describes a situation in which customers are intimidated and dissatisfied with the complexity of customizing products and would rather choose to buy standard products, did not occur in our experiment. This is conceivable, since the customizing tasks in our study are not as complicated as the ones in previous studies, and mass confusion mainly results from the high level of perceived complexity customers experience in difficult customization processes. In our experiment, only five attributes of an MP3 player and a bottle of perfume were designed to be customized. Such customizing experiences may not be as complicated as the customizing tasks mentioned in the previous studies, such as customizing 18 different attributes of sofas (e.g., back shape, stuffing amount, and covering materials), among which some attributes are fairly difficult to decide on.<sup>3</sup> The significant bolstering effect of compatible cues on customer responses in the absence of mass confusion implies the robustness of cues provision effect. If cues can enhance customer responses when decisions are not too overwhelming, their augmenting effect on positive consumer responses may be greater when customers are in need of assistance.

The significant two-way interaction between cues and customization suggests cue provision is associated with a higher level of customer satisfaction and purchase intention when customization is involved. This corroborates the notions that the provision of product information can improve positive experiences<sup>42</sup> and elicit higher customer satisfaction<sup>43</sup> in online shopping environments, and this enhancement of positive customer responses is contingent upon the complexity of a shopping task. As information provision contributes to save time, enhance customer knowledge, and therefore achieve higher customer satisfaction,<sup>43</sup> this effect is likely to be of greater magnitude when it is more difficult for consumers to make the purchase decisions. For instance, a study in e-commerce by Swaminathan demonstrates that decision aids such as recommendation agents can enhance decision quality to a greater extent when the number of product attributes or alternatives increases.<sup>44</sup> Similarly, it can be expected that the effects of cues would be amplified in a customization context where task complexity may increase due to a greater number of decisions. Hence, it will be particularly beneficial for firms offering customization to provide decision facilitating information because customization tends to create a shopping environment in which consumers are faced with a large number of options and/or difficult configuration choices.

In summary, due to their high predictive and confidence values, compatible cues can better facilitate customer preference identification processes in a customization task, and as a result, reduce perceived complexity to a greater degree<sup>3</sup> and achieve a higher level of satisfaction and purchase intention.

### *Managerial implications*

Consistent with the existing perspective on mass customization strategies,<sup>1,2,45</sup> the results of this study suggest that customers would show more favorable responses to customized products if appropriate assistance is available. Accordingly, marketers could employ strategies more in line with the product category being marketed, while implementing mass customization in order to create more positive customer responses. Providing customers with compatible cues during customization processes can perform such a function because cues provide customers who have less well-constructed preferences with a reason to make their decisions<sup>10</sup> and enhance customer evaluations in the customization process.<sup>11</sup> For example, for a search product, the interactive systems for mass customization could be built with itemized cues that provide detailed specifications and descriptions of attribute options, thus allowing customers to compare each option effortlessly and then to find the best option. Furthermore, interactive 3D product presentations enabling visual inspection of products online could also be implemented in order to allow customers the opportunity to examine search attributes, such as color and exterior design. However, in the case of experience products, companies would benefit more from the employment of extrinsic cues such as celebrity endorsers, expert recommendations, and a list of best-selling options. Such cues would provide customers with a customizing experience characterized by greater levels of confidence and ease.

### Limitations and future research directions

While laboratory settings in this study provided the facility to eliminate the influence of individual differences in brand affinity and Web site familiarity, field studies that can observe real customer purchase responses toward customized offers in a natural setting are needed. Another limitation of this study is the issue of external validity. While youths ranging from age 19 to 35 can represent a great potential target for Web-based customized products, as a sample group they might not be representative of the whole population and, consequently, these results need to be interpreted with caution.

Additional studies can be conducted to extend this research by including credence products and testing whether different types of extrinsic cues are differentially effective across different product categories. Moreover, due to the nature of experiment, in this study, only a limited number of product attributes (five attributes for every product) and attribute options (three options per attribute) were investigated. Different levels of the variables may have an impact on customer responses. For example, when the number of product attributes or attribute options increases, would the provision of compatible cues enhance customer satisfaction and purchase intention to a greater degree, or would it decrease these variables due to customer annoyance with repetition? This would be an interesting research question to answer.

### Notes

- a. Credence products, a third class identified by Darby and Karni,<sup>46</sup> describes products that can be evaluated only after they have been used for a period of time or evaluated accurately after use because of the lack of consumer expertise. While it can be of value to explore the effective cues for this third product category, no specific predictions can be obtained following the logic of cue utilization theory. According to this theory, for both experience and credence products, customers may similarly rely on extrinsic cues because the intrinsic cues may be low in either predictive or confidence value or both. Therefore, no significant difference in their reliance on extrinsic cues was expected. While we recognize that customers may depend on different kinds of extrinsic cues (e.g., celebrity endorser or expert endorser) for different product categories (e.g., celebrity endorser for experience products and expert endorser for credence products), customers still rely on extrinsic cues in general though different endorsers are involved. Since we are interested in the effectiveness of different cue types (i.e., intrinsic vs. extrinsic) rather than the finer classification within each type, the credence product was not chosen as our target in this study. Discussions about such possible further research efforts, however, are included in the Conclusions and Discussions section of this paper.
- b. Because the confidence value of a cue may fluctuate according to customer knowledge, customers' familiarity with both products (MP3 player and perfume) was assessed in a pretest. The results of the pretest suggest that participants showed no significant difference in familiarity with the products. Moreover, as expert customers such as engineers and fragrance makers are very rare among our sample, the possibility of this study being biased because of customer familiarity should be negligible.

### Disclosure Statement

The authors have no conflict of interest.

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