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The Interplay between Customer Participation and Difficulty of Design Examples in the Online Designing Process and Its Effect on Customer Satisfaction: Mediational Analyses

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Abstract

In the current consumer-centric economy, consumers increasingly desire the opportunity to design their own products in order to express more effectively their self-image. Mass customization, based on efficient and flexible modulization designs, has provided individualized products to satisfy this desire. This work presents an experiment employed to demonstrate that customer participation leads to higher satisfaction. Specifically, the increment in customer satisfaction due to participation is greater when an easy example is provided than when either no example or a difficult one is provided. Additionally, self-congruity plays a mediating role on the customer participation–satisfaction relationship, and this mediating effect varies across different levels of the design example provided in the design process. When an easy design example is present, customer participation has a direct effect on satisfaction, in addition to the indirect effect of self-congruity. When a difficult example is provided, customer participation does not have incremental effects on either self-congruity or customer satisfaction. Finally, when no design example is shown to customers, contrary to our expectation, participation still enhances customer satisfaction due to an increased sense of self-congruity.

Introduction

In the age of e-commerce, technological advances offer firms the means with which to strike a balance between opportunities for customer selection and product customization and the need to keep production costs down.[1] An increasing number of companies in different industries, such as Dell and Capital One, have successfully implemented customization. By allowing customers to configure product attributes such as computer components and interest rates, firms proffer customers with greater economic and functional benefits.[2,3] Besides utilitarian benefits, customers receive hedonic benefits from both interactive design tools and customized products. Interactive design tools offer customers opportunities to enjoy interactive designing experiences, and customized products also provide customers with opportunities to express their ideas and tastes to greater degrees.[4] For example, the project Mi Adidas allows consumers to order unique footwear by specifying their preferences for colors and styles as well as the opportunity to enjoy the novel experience of interacting with virtual 3D technologies. However, little effort has been made to investigate empirically whether or not online interactive design tools can effectively assist customers to create satisfactory and individual design patterns. Among the few exceptions, one study focuses on the extent to which customers participate in using online interactive design tools and demonstrates that for customized T-shirts, the greater the extent of customer participation in the designing process, the greater the satisfaction achieved.[5] Another related empirical study suggests that the interactive design tool has the advantage of assisting customers in selecting components of watches and of giving visual feedback on watch design offers.[6] Compared to standard watches, such self-designed watches through the interactive design tool can increase customer willingness to pay by up to 100%.[6]

Despite the positive findings, some practitioners and researchers have maintained that the effect of customer participation may be contingent upon perceived complexity or difficulty.[8–11] At times, the large number of product features and options could increase the perceived difficulty of customizing a product or service, particularly for those customers who lack the necessary expertise or well-defined preferences.[7] In order to increase customer evaluation and acceptance of customized products, it is necessary to empir-

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ically study strategies marketers can employ to reduce the difficulty of the customizing process and to attain more positive customer responses.

In addition, the increased satisfaction resulted from customer participation can be attributed to the fact that customers can gain a higher sense of self-congruity by designing their own individual products. The investigation of self-congruity in this study is of particular relevance because whether a product can reflect an individual's self-image usually influences his or her purchasing behavior.[8] Moreover, it has been suggested that customers consider the enhancement of individuality an important factor that motivates them to participate in apparel customization.[4] Customized products can better enhance the self-congruity between a product and customer self-image, which may result in higher customer satisfaction due to the opportunity to design products that reflect personal image and style.[4]

This study conducted an experiment to address the following research questions: (a) Is customer satisfaction enhanced when customers are allowed to participate in the designing process by using online interactive design tools? (b) If customer participation is found to increase customer satisfaction, does the increment vary with levels of difficulty of the design example provided? (c) Does customer participation increase satisfaction via augmented self-congruity? (d) Is this mediating effect of self-congruity the same for design examples of varying levels of difficulty?

Most previous studies concerning customer participation focused on discovering the augmenting effect of customer participation on satisfaction;[5,9,10] however, evidence in support of the mediating effect of self-congruity has not been documented. Therefore, this study proceeds from the expectation that variations in the design example difficulty may affect the customer participation–satisfaction relationship. In addition, the mediating effect of self-congruity may also be contingent upon the difficulty of design examples. For this purpose, customer satisfaction and perceived self-congruity with the customized T-shirts were measured across levels of design example difficulty in order to address the questions posited above.

Literature Review

Benefits associated with customer participation

Several empirical studies of mass customization revealed that customers who participate in the design processes show a higher level of satisfaction and willingness to pay premium prices.[3,5,6] Through the contingent valuation of method and a Vickrey auction, Franke and Piller assessed the price premium in mass customization and discovered that watches designed by customers themselves surpass standard watches in terms of customer willingness to pay by almost 100%.[6] Similar findings were obtained in Schreier's study, which shows that by using design toolkits that allow instant visual feedback on customized products, such as cell phone covers, T-shirts, and scarves, customers show a greater willingness to pay than they show for standard ones, ranging from 106% (scarves), to 113% (T-shirts), to 207% (cell phone covers).[3]

The value increment of self-designed products may be attributed to both the enhanced utilitarian and hedonic benefits associated with the final products.[3] Additionally, the control customers obtain from being able to master a task may contribute to the elevated product value perceived by them. Utilitarian benefits are derived from the performance, functionality, convenience, or efficiency of a product.[11] Because customized products are at least partially designed by customers, they are expected to meet customer needs more precisely. As a result, customers can derive more utilitarian benefits from customized products than from standard ones.[3] For example, customers can configure a Dell computer by selecting processor, memory, storage, and other equipment to meet their needs more precisely.

In addition to the utilitarian benefits, another drive for customers to participate in the designing process is the heightened hedonic benefit from the individuality of the customized product and the excitement gained from the designing process.[4] Hedonic benefits are defined as the pleasure-oriented aspects of shopping, such as fun, enjoyment, fantasy, sensory stimulation, and festive experiences.[12,13] Customized products can deliver more symbolic values to customers and better satisfy customer needs, such as the expression of beliefs, demonstration of social status, and sense of uniqueness.[11,14] And the designing process itself entails exciting experiences for customers, such as fulfilling a fantasy to become a designer.[4]

In addition to the utilitarian and hedonic benefits associated with customized products, the sense of ownership and responsibility[15] is enhanced because customers gain more control in the customization process. Behavioral control, defined as "availability of a response which may directly influence or modify the objective characteristics of an event,"[16] over the interactive design tools is likely to result in higher evaluations of outcomes[17] and greater behavioral intentions.[18] An experiment on pizza customization also demonstrates that customers who participate in the production of pizzas through their choice of ingredients demonstrate greater behavioral control, which leads to higher product evaluations.[17] Similarly, Kamali and Loker found that customers who are allowed to mix and match T-shirt components such as neckline, sleeve, color, and patterns in an online store experience higher levels of satisfaction.[5] It is reasonable to expect that when customers participate in the design process and have a direct influence on final products, they are likely to experience higher levels of satisfaction.

H1: In general, consumers who participate in designing their own products will be more satisfied with the product than those who do not participate in the designing process.

The moderating effect of the difficulty of a design example in customization processes

Although, generally speaking, customers who can participate in the design process demonstrate higher levels of satisfaction, at times customers can also be confused by the diversity and complexity of products or elements offered in customization processes. While some customers enjoy the process of interactive customization, others may experience impatience, frustration, and confusion due to either low need for cognition,[19] deficient involvement,[20] unclear preferences,[7] or inability to perform the customizing task. As a consequence, the potentially positive effect of customer participation may be limited if customers perceive the customization task to be too complex for them to perform successfully.

Huffman and Kahn use the term *mass confusion* to delineate the phenomenon mentioned above.[7] They assert that mass confusion results mainly from perceived complexity and can be effectively reduced if tactics in dealing with complicated customization processes are proffered.[7] For example, presenting information about hotels or sofas in an attribute-based format can assist customers in learning within-attribute preferences, and thus their perceived complexity of choice sets can be reduced.[7] Providing materials that can assist participants in walking through difficult customization processes may also be an effective way to alleviate this problem and to increase customer enjoyment. For example, in a case study of a collaborative residential development project in which community residents were encouraged to participate in the design process through a Web site, a system offering timely feedback from the architect about the feasibility of construction details (e.g., layout, safety, and public spaces) assisted residents without professional knowledge to still enjoy the designing process.[21] As a result, a higher level of community satisfaction was achieved.[21] In summary, it is expected that when customers are given assistance in recognizing their affinities for individualized designs, the positive effects of customer participation are more likely to be brought into full play.

Sometimes, firms present design examples to customers in order to better facilitate the process of customer participation. Examples may help customers to identify their preferences in designing styles more effectively, mitigate the frustration induced by complicated designing processes, and ultimately enhance customer satisfaction with the outcome. However, many companies tend to provide attractive but rather complicated design examples to arrest the attention of customers, which might result in customer frustration and lowered purchase intension. In accordance with social cognitive theory, people who believe that they possess the necessary knowledge and skills to perform a particular task will feel more comfortable to engage in that task[22] and are more likely to take part in those tasks, since they may be afforded with mastery experiences. On the other hand, those who perceive themselves as less efficacious will be less willing to perform the task and feel less satisfied with any outcome. For example, if a student is shown an average student record, he is more likely to be satisfied or confident with his own running time. In contrast, if a seemingly unachievable standard has been set (e.g., a race record set by an Olympic gold medalist), the same person's satisfaction may be reduced. Hence, when customers are provided with design examples exceeding their design ability, they are more likely to become dissatisfied with their own work because they feel they are less confident in creating equally attractive designs. When no design examples are presented, customers may feel there is no direction and perceive the design task as too difficult. As a result, in situations with no design examples provided, customers are less likely to feel satisfied with their own designs.

In contrast, easy design examples may provide customers with direction about what to do and, more importantly, convey the message that the creation of designs is realistically achievable. Thus, in contrast to customers who receive difficult or no design examples, those who are faced with easy design examples are more likely to enjoy the customization process and show higher levels of satisfaction with their final products. Accordingly, in this study it is argued that not all design examples are equally effective in augmenting consumer satisfaction.

Based on the preceding discussion, the second hypothesis can be formulated as follows:

H2: The positive effect of customer participation on satisfaction will be enhanced when a customer is provided with an easy design example than when provided with a difficult design example or no design example.

The role of self-congruity

Self-congruity has been defined as the match between product personality images and customer perceived self-images.[8] Products considered to have "personality images" can be described as lively, youthful, faithful, or conservative. In order to maintain their self-consistency, customers are more likely to choose products of high self-congruity because these products reflect their self-images.[8] Previous research on advertising has also maintained that for value-expressive products, advertising should emphasize the self-congruity that exists between customers and products in order to encourage positive attitudes in potential customers.[23] In the context of customization, self-congruity may have an even greater impact on customer responses, since the purpose of customization for many customers is to express their values, tastes, and styles through their individualized products.

When customers participate in the design process, the opportunity to be involved in creating individualized designs is likely to increase customer perception of self-congruity. For instance, customers are able to enhance their individuality by creating unique fashion products for self-expression such as shoes, pants, dresses, and skirts.[4] This augmented self-congruity then increases customer satisfaction with the customized products. Hence, it is reasonable to conjecture that customer participation may result in higher levels of satisfaction as a result of increased self-congruity. In other words, it is expected that self-congruity will mediate the relationship between customer participation and satisfaction. Hence, the following hypothesis can be formulated.

H3: The relationship between customer participation and satisfaction is mediated by the self-congruity perceived by customers.

Our second hypothesis states that the augmented satisfaction resulting from customer participation is likely to be contingent upon the level of difficulty in the design example. Since self-congruity mediates the participation–satisfaction link, it is reasonable to postulate that the mediating effect of self-congruity is also likely to vary due to the difficulty of design examples. According to social cognitive theory,[24] consumers prefer and enjoy more behaviors they are capable of performing. Compared with a situation in which a difficult example or no example is present, when an easy example is provided, it is easier for consumers to perceive that they have mastered the task. Under such circumstances, self-serving bias will tend to lead customers to take credit for the relatively more successful final customized products. Furthermore, they perceive such products as more self-congruent due to the biased attribution of the credit for success to themselves and of failure to external causes.[20] Bendapudi

and Leone empirically demonstrated that when the outcomes are better than expected, customers who participate in the production processes of products or services will attribute to themselves greater credit for successful outcomes.[20] On the other hand, when the outcomes are worse than expected, even though customers have participated to create the products, they are less likely to take the responsibility for the outcomes and to consider the final products as unrepresentative of themselves. In other words, when customers are provided with an easy design example, they are more likely to perceive themselves as capable of creating satisfactory designs and are more likely to consider the designs as self-expressive. In such a case, they will be more likely to sense the final customized product as self-congruent, and this will eventually lead to a higher level of satisfaction. Thus, the following hypotheses have been developed:

H4: The mediating effect of self-congruity on the customer participation–satisfaction relationship will vary contingent upon the difficulty of the design example provided.

H4a: Self-congruity will mediate the customer participation and satisfaction link only when an easy design example is provided.

Methods

Participants

One hundred eighty students (115 male, 65 female) participated in this study. Their ages ranged from 18 to 25 years. Respondents were provided with the chance to win approximately US$30 as an incentive for their participation.

Experimental design

A 2×3 between-participants factorial experiment ($n = 30$ for each cell) was conducted, including two levels of customer participation (participation and no participation), and three levels of perceived difficulty (no design example, easy design example, and difficult design example).

Stimulus and procedure

Previous researchers studied mass customization in the fashion industry,[5,25] an industry in which it is flourishing. Therefore, the T-shirt was selected as the target stimulus for customization in this study. In order to select the proper target stimulus, a pretest of 115 participants was conducted to choose two design examples (easy vs. difficult) out of 12 designs from an online gallery. The results of the pretest showed no significant difference in terms of attractiveness ($t = 0.271$, *ns*, $p = 0.506$), but a significant difference in perceived difficulty ($t = 6.761$, $p < 0.001$) between the two selected design examples was found. The results of this pretest indicated that the manipulations were effective.[26]

Participants were first asked to self-report their ability to design a T-shirt, and then they were randomly assigned to the experimental group (participation) and the control group (no participation). Participants in the experimental group were told that they could use the Flash drawing tool[1] that had been recently launched by an online T-shirt store to design a T-shirt of their own. Those in the control group were told that an online T-shirt store recently introduced a design tool, which they were welcome to try out. However, after their trial use, their input was not incorporated into the final products. Rather, they were presented with a T-shirt allegedly designed by another person using the same tool.[2] In each group, one-third of participants were provided with no example, one third with an easy example, and the final third with a difficult example. After they finished the tasks described above, participants were asked to fill out a questionnaire regarding their satisfaction[3] and perception of self-congruity for the T-shirt either designed by themselves (participation) or by their yoked counterpart (no participation).

Measures

As customers' self-perception of their designing ability may have a significant impact on their satisfaction ratings, their self-assessed designing ability was measured to isolate its effect. It was measured using subjective perceptions of how customers evaluate their ability to manage the designing tasks. These measures were modified from the scale used by Park and Moon.[27] One item, for example, to which they responded was, "Compared to other people, I think I have superior art abilities."

The satisfaction scale was modified from the scale used in the study of Spreng et al,[28] which includes five semantic differential items anchored as *very dissatisfied/very satisfied*, *very displeased/very pleased*, *very uncomfortable/very comfortable*, *very dislike/very like*, and *very frustrated/very contented*.

Self-congruity was assessed following the steps proposed by Sirgy et al.[29] Participants were first instructed to take a moment to think about the T-shirt pattern and the kind of person who would typically wear it. Then they were asked to describe this person using one or more adjectives, such as "stylish" and "sexy." After they wrote down the adjectives, participants were asked to rate the extent to which they disagreed or agreed with the statements adapted from the study.[29] One statement, for example, was: "Wearing this T-shirt is consistent with how I see myself."

To satisfy the demands of reliability, the Cronbach alpha was calculated, and all measurements exceeded the cutoff point of 0.7, indicating a high internal consistency for each scale.

Validity

To satisfy the requirements of construct validity, the principal axis factor analysis using the direct oblimin rotation was performed due to the correlation between satisfaction and self-congruity. A reasonable factor structure was produced to support the convergent validity with all item loadings higher than 0.6 on the appropriate dimensions. Finally, with respect to discriminant validity, the correlations among the measures taken were lower than the alpha coefficients of themselves.

Results

Manipulation checks

A manipulation check was employed to assess the effectiveness of the perceived difficulty for each design example. The results show that when participants were provided with a difficult example, their perceived difficulty was signifi-

TABLE 1. SUMMARY OF ANCOVA

Source	Type III sum of squares	df	MS	F	Sig.
Self-assessed ability	9.229	1	9.229	7.007	0.009**
Participation	54.696	1	54.696	41.525	0.000***
Sample provided	1.129	2	0.564	0.428	0.652
Interaction	10.568	2	5.284	4.012	0.020**
Error	227.874	173	1.317		
Total	3351.640	180			

Dependent variable: satisfaction. df, degrees of freedom; Sig, Significance.
**$p < 0.05$; ***$p < 0.001$.

cantly higher than when an easy example was provided, $F(1, 118) = 45.71$, $p < 0.01$. The results also demonstrate that the attractiveness of these two design examples was not perceived to be significantly different, $F(1, 118) = 0.07$, *ns*, $p = 0.79$.

Main effect of customer participation and moderating effects of design examples

An ANCOVA was conducted to examine the first and second hypotheses. In this analysis, self-assessed ability in designing was taken as a covariate to control the possible effects caused by individual differences in designing capability, and the dependent variable was customer satisfaction with the customized product.

Table 1 summarized the ANCOVA test. The results reveal a significant effect of customer participation, $F(1, 173) = 41.525$, $p < 0.001$, and a significant interaction between customer participation and design examples, $F(2, 173) = 4.012$, $p < 0.05$. To further investigate the main effect of customer participation, the group means were examined. The means suggest that respondents who participated in the designing process had a higher level of satisfaction than respondents in the no-participation condition ($X_P = 4.67$, $X_{NP} = 3.56$, $p < 0.001$). Thus, these results provide support for H1.

The significant interaction supports H2, which states that the positive effect of customer participation on satisfaction will be stronger when an easy design example is provided than when a difficult one or no example is provided. The results of post hoc tests show that mean differences in satisfaction between participation and no-participation groups were greater when an easy design example was provided than when a difficult one or when no example was provided (difference in satisfaction: $X_{EASY} = 1.751$, $X_{DIFFICULT} = 0.597$, $X_{NO} = 0.872$, least significant difference post hoc test, $p < 0.05$).

Mediation analysis

Mediation analyses following the procedures suggested by Baron and Kenny[30] were performed to demonstrate that (a) the independent variable (customer participation) has a significant influence on the proposed mediator (self-congruity) by regressing the mediator on the independent variable; (b) the independent variable is shown to affect the dependent variable (satisfaction level) significantly by regressing the dependent variable on the independent variable; (c) when both the independent variable and the mediator are in the regression model, the mediator must significantly affect the dependent variable, and the effect of the independent variable on the dependent variable must be less than that in the second regression model. The whole sample was first analyzed with the above procedures. Additionally, for each level of difficulty of the design examples provided, the same analysis was conducted.

To examine the degree of mediation for the whole sample, first, self-congruity was taken as a dependent variable and regressed on customer participation. Then the dependent variable satisfaction was regressed on self-congruity, on customer participation, and finally on both customer participation and self-congruity. The impact of customer participation on self-congruity was significant ($t = 5.97$, $p < 0.001$, $\beta = 0.408$). Moreover, it was found that customer participation significantly influenced satisfaction ($t = 6.083$, $p < 0.001$, $\beta = 0.415$). When satisfaction was regressed on both customer participation and self-congruity, both customer participation ($t = 2.523$, $p < 0.05$, $\beta = 0.139$) and self-congruity ($t = 12.253$, $p < 0.001$, $\beta = 0.675$) were significant. Thus, in general, self-congruity was corroborated to be a significant mediator in the participation–satisfaction relationship. Therefore, the above provides support for H3.

Moderated mediation analyses

When an easy design example was provided, the impact of customer participation on self-congruity was significant ($t = 5.69$, $p < 0.01$, $\beta = 0.599$). Furthermore, the influence of customer participation on satisfaction was significant ($t = 6.78$, $p < 0.01$, $\beta = 0.665$). When satisfaction was regressed on both customer participation and self-congruity, both customer participation ($t = 3.30$, $p < 0.01$, $\beta = 0.322$) and self-congruity ($t = 5.88$, $p < 0.01$, $\beta = 0.573$) remained significant. The results of the mediation analyses indicate that self-congruity acts as a partial mediator between customer participation and satisfaction when easy design examples are provided. These findings were consistent with the prediction of H4a.

In the case of a difficult design example, the impact of customer participation on satisfaction was significant ($t = 2.01$, $p < 0.05$, $\beta = 0.255$); however, the impact of customer participation on self-congruity was not ($t = 1.61$, $p = 0.113$, $\beta = 0.207$). When satisfaction was regressed on both customer participation and self-congruity, the impact of self-congruity on satisfaction remained significant ($t = 7.342$, $p < 0.001$, $\beta = 0.689$), whereas the influence of customer participation was insignificant ($t = 0.235$, $p = 0.235$, $\beta = 0.113$). These results

indicate the absence of any mediation effect of self-congruity on the relationship between customer participation and satisfaction.

When no design example was provided, the effects of customer participation on both self-congruity ($t = 3.68, p < 0.01, \beta = 0.435$) and satisfaction ($t = 2.55, p < 0.05, \beta = 0.317$) were significant. In addition, when satisfaction was regressed on both customer participation and self-congruity, the impact of customer participation became insignificant ($t = 0.07, p = 0.948, \beta = 0.007$), while the impact of self-congruity remained significant ($t = 6.96, p < 0.01, \beta = 0.714$). Thus, a perfect mediation of self-congruity was evident.

The mediation analyses provide support for H4, the mediating effect of self-congruity on the relationship between customer participation and satisfaction being contingent upon design examples. However, H4a was only partially supported. When an easy design example was provided, a mediating effect of self-congruity on the relationship between customer participation and satisfaction was observed. In the instance involving a difficult example, no mediation effect was found. However, surprisingly, when no design example was provided, self-congruity also mediated the relationship between customer participation and satisfaction. These relationships are discussed in detail in the next section.

Discussion

Conclusions

Based on the ANCOVA results, the main effect of participation suggests that encouraging customer participation tends to raise their satisfaction with a customized product. From a theoretical perspective, this supports the link between customer participation and satisfaction. This phenomenon of participation may be explained by greater behavioral control over the final outcome. The heightened customer satisfaction due to more perceived control is rooted in the personal responsibility[15] that customers are more likely to assume in a designing process. This assumed responsibility, in turn, increases customer ownership of the product and therefore raises customer evaluations of their creations. This finding is consistent with the idea that customers who have the opportunity to participate in a certain task perceive more control and tend to feel more responsible for as well as more satisfied with the outcome.[15] For example, users of iGoogle are allowed to select different features, such as themes, gadgets, and layouts, for their Google home pages; thus, they obtain a higher sense of control as well as more positive experiences of iGoogle.

According to prior research, control affects outcome satisfaction when customers believe that they have the capability to bring about desirable outcomes.[31] When customers are not very certain whether they can accomplish a task successfully, such as when facing difficult examples during the designing process and becoming less confident in mastering the designing task, the effect of control might be reduced. The results of our study concerning H2 suggest this rationale has some basis. Even when self-assessed ability is taken into account, when an easy example is provided to customers, customer participation can increase satisfaction to the highest degree. However, when a difficult example or no example is present, customer satisfaction augmentation fails to reach the same level.

The meditation analyses further suggest that the augmenting effect of customer participation on satisfaction is mediated by consumer perception of self-congruity. When customers have the opportunity to customize, they are more likely to find the final product to be self-congruent. Furthermore, the more consumers perceive the final product they design as a reflection of who they are, the greater the satisfaction. However, the mediating effect of self-congruity is not the same across different levels of design examples. The results concerning H4 further suggest that the mediating effect of self-congruity is contingent upon the level of difficulty of the design examples with which customers are provided.

When provided with an easy design example, self-congruity is a partial mediator, which indicates that customer participation has a direct effect on customer satisfaction in addition to the indirect effect via self-congruity. The indirect effect suggests that when an easy example is present, customers are more likely to consider themselves as being capable of translating their personal characteristics into designs. This incremented perception of self-congruity due to participation in the designing process then enhances customer satisfaction with the final products. In such a process, they are more likely to enjoy their participation in the design process and able to create designs more congruent with their perceptions of themselves that express their personal tastes, faith, and social status,[29] and thus they are more likely to feel satisfied with their designs. Furthermore, above and beyond this indirect effect, participation alone has a direct positive impact on customer satisfaction when an easy example is provided. That is, simply being able to participate in the design process can have the additional effect of enhancing customer satisfaction. While the sense of control is highly contingent upon individuals' perception of their capability to influence the outcome of an event, an easy design example is more likely to lead customers to believe that they can successfully accomplish such designing tasks. This belief in turn raises their level of satisfaction with their final products.

When a difficult design example was provided, the pattern of mediation was different. Customer participation did not lead to the enhancement of either self-congruity or customer satisfaction. This corresponds to social cognitive theory. When individuals do not deem themselves as efficacious in the satisfactory accomplishment of a task, they tend to become less willing to perform the task and are more likely to feel dissatisfied with their situation.[22,24] For example, a student who is not good at mathematics is likely to feel frustrated and dissatisfied with mathematics study. In the context of T-shirt customization, a design example that exceeds the abilities of customers may cause them to think that they are incapable of creating a T-shirt pattern that is equally complex and attractive. Under such circumstances, owing to self-serving bias, customers are less likely to consider that their designs are self-relevant. As a result, participation did not have an indirect effect on satisfaction via the sense of self-congruity. Additionally, in such a situation, customers are less likely to feel competent in creating satisfactory results, and this reduces the direct impact of participation on the level of satisfaction with the final outcome. This might help explain why there is no direct effect of participation on customer satisfaction.

The results of mediation analyses in the no-example con-

dition somewhat contradict our prediction that only easy design examples can help customers gain a higher sense of self-congruity and thereby increase the level of satisfaction with the customized T-shirt. Without the presence of design examples, the meditation analyses show that self-congruity is a perfect mediator of the participation–satisfaction relationship. In other words, although no direct effect of participation on customer satisfaction is observed, participation can increase customer satisfaction via self-congruity. That is to say, whether or not customers are satisfied with the final customized products depends on the sense of self-congruity rooted in the designs that they create. While speculative in nature, this may be because in the absence of an example, some customers were able to create a design congruent with their self-images while others were not. Therefore, participation alone did not have a direct effect on satisfaction. Only when participation increases self-congruity does customer satisfaction with the product also increase. The mechanism of this phenomenon, however, is yet to be discovered by further research.

Implications

Some directions for marketing practitioners can also be drawn from these results. The main effect of customer participation indicates that marketers should encourage customers to participate in the designing process to enhance customer satisfaction. For example, customers can experience the pleasure and satisfaction associated with designing individual T-shirts that meet their personal and symbolic needs.

While consumer participation is associated with augmented satisfaction, this effect is contingent upon the presence of design examples that do not exceed customers' design abilities. Provision of attractive but inherently complicated design examples or no example may not be an effective strategy for creating customer satisfaction with customization. Customers may become frustrated by their inability to produce equally attractive and complicated items when an intricate example is proffered. On the other hand, when no example is at hand in the designing process, some customers might feel lost about what they can do and how to do it. Therefore, marketers should conduct general surveys to identify which level of difficulty suits most customers in order to find design examples to meet general customers' design abilities. Firms can then provide design examples that are not overwhelmingly complicated to facilitate the design process in order to increase customer satisfaction. Design examples with proper levels of difficulty will allow customers to experience greater satisfaction through their participation in the customizing process. In this way, the effect of customer participation can work to its full capacity.

Limitations and future research direction

While the sample size is sufficient for an experimental design, the ability to transfer these results to the general population is limited by its base sample, which mostly comprised university students ranging in age from 18 to 25 years. However, a mostly student sample may be useful and justified based on the findings of a survey of online shopping, which reports that customers aged from 20 to 29 compose the largest segment (approximately one-third) of online shoppers in Taiwan.[32] Therefore, the importance of this segment itself warrants reasonable research attention.

Since the positive effects of customer participation may be explained by increased control, it would be useful to establish whether or not perceived control also serves as a mediator to explain the effects of customer participation on these variables. Furthermore, the effect of customer participation may vary across cultures, since the degree to which individuals want to express themselves by customizing products can differ. The need to express one's personality via customization can be potentially stronger in individualistic cultures than in collective cultures.[33] Thus, the enhanced satisfaction as a result of participation can be strengthened in the individualistic cultures.

In addition, the present study examines customer participation for a specific product category, T-shirts, a highly hedonic and symbolic product. However, it is possible that these results cannot always be generalized to other product categories. For instance, whether or not the customization of a utilitarian product, such as a computer, that allows customers to configure hardware and settings to meet their specific functional needs provides the same result warrants further research.

Notes

1. Participants in each group were asked to use an online Flash drawing tool, Mr. Picassohead (www.mrpicassohead.com). None of the respondents reported previous experience in using such a Flash drawing tool; therefore, the experience with this specific tool was not a confounding variable.
2. In order to ensure that each participant received a T-shirt with an identical degree of attractiveness and that the only difference between the participation and no-participation groups was the opportunity to create their own customized T-shirt, the yoked-control technique employed by many prior choice studies was adopted. Using this technique, participants in the experimental group designed their own T-shirt and rated their satisfaction with their own work, whereas their counterparts in the control group were assigned a T-shirt designed by their yoked counterpart and were asked to rate their satisfaction with that T-shirt.
3. The participants rated their satisfaction with the T-shirts before receiving them. Therefore, it ruled out the possibility of the influences of cognitive dissonance and buyer's remorse after the purchase.

Disclosure Statement

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