

How the Inhabited Space Helps Consumers Customize Good Products

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Abstract. Consumers could derive benefit from the preference fit through the online customization. However, consumers' preferences are often ill defined and sometimes unstable. Many methods are discussed to solve this problem in online customization. In this research, the authors propose a new method to examine whether the inhabited space would have different influences on consumers' perception of preference fit in an online customization context. Also, the mediating role of psychological distance between the consumers and the products is examined. Using subjects from a Chinese university, they report a study involving real customization tasks on a well-known Chinese customization website. The study arrives at the conclusion that the configurator with a higher inhabited space will help the consumers to customize more preferred products, which would be partial mediated by the psychological distance between the consumers and the customized products. The results would offer insightful guidelines to customization websites.

Keywords: Customization · Inhabited space · Preference · Psychological distance

1 Introduction

According to Forbes, many consumers nowadays customize products on mass customization websites in order to get their most preferred goods. Online customization is becoming increasingly more popular among consumers, firms, governments and researchers [1, 2]. One of the crux problems in online customization is the configurator which is a toolkit for the consumers to customize the products. Research has also confirmed that configurator used in the mass customization websites could help consumers construct their preferences, which in turn creates values for customers and thus enhances their willingness to pay as well [3]. And the configurator is also regarded as an interaction toolkit and value co-creation between the consumers and the company [4]. According to Prof. Piller's study, the cost of the configurator is very high (often more than 100 thousand dollars) [3]. And only when the consumers are satisfied with the configurator in online customization, they may be able to finish the customization, and purchase the products, return to the website and even recommend it to others [5]. Riemer [6] finds that users' satisfaction toward the configurator may directly influence their satisfaction to the final products. Therefore, How to design the configurator is a key problem in the online customization.

Therefore, there are many studies about online configurator. Prior studies on customization configurator most focus on the functional requirements and structural features of a product family as well as information presentation format of the toolkit [1, 7, 8]. Some other studies focus on design principles of the configurator and some features such as starting solution, which could be buried in the configurator to influence consumers' perception and behavior [9–12]. All these studies regard the configurator as an Online Customization Toolkit which provides functions for the consumers to customize their products.

However, the configurator is also a central interaction interface between the customer and the mass customization company as well as the product itself [5]. The mass customization company provides product modules and presents relevant information in this configurator and in turn the consumer elicits their needs for this product to the company during the customization process. And the configurator also provides customers with a chance of trial and error so that they can try all options available in this configurator. Actually, the atmospherics of a retailing store, which is defined as “conscious designing of the space/web environments to create positive effects in users in order to increase favorable consumer responses”, has significant impact on consumers' purchasing behavior both online and offline [13–16]. Only a slight change in a picture used in the website design can change consumers' purchase intention [17].

Prior research suggests that the interaction in virtual world can be enhanced through inhabited space, which refers to the degree of being situated in a context and in a meaningful place [18], because this inhabited space provides relevant atmosphere with context, meaning, and history. Applied to the online customization environment, inhabited space can be defined as the context where the product will be used. For example, a configurator for a swimsuit with a background of beach can give the feeling that the users are trying these swimsuits on the beach. Hence, this beach background provides inhabited space by showing a meaningful place.

In this paper, we investigate how the inhabited space of the configurator affects consumers' perception and attitude during the online customization process. We suggest that a configurator with a higher degree of inhabited space will lead to a higher perception of preference fit for the consumers. According to prior studies, consumer's preference is constructed during the decision process rather than buried in the memory [19, 20]. Actually, many researchers consider that consumers have ill defined and unstable preferences, which is a big challenge in the online customization [21]. And some following studies suggest that providing specific context cues such as starting solutions and peer suggestions can help consumer form initial design and get high preference fit [12, 22]. Accordingly, the inhabited space which refers to the context where the product will be used is also a context factor for the consumers. And compared with the context without inhabited space, the configurator with an inhabited space can help the consumer construct his/her preference more easily and also get a high perception of preference fit. Moreover, one problem in online customization is the separation of the design environment and the using context. The consumers design the products in the online configurator but will use these products in a specific context. For example, the consumer will design a flower vase which is intended to be put in a bedroom with a modern decoration. Therefore, in order to get a higher preference fit in the online customization, the product information as well as the using context

information should be presented to the consumers at the same time. The inhabited space may solve this problem.

Besides, according to the endowment effect, the fact that the consumer feels like the originator of the object may generate values to the product so as that the consumers may be willing to accept a low-quality outcome. This effect is called as ‘I designed it myself’ effect [23]. In another word, the psychological distance between the consumer and the customized product may influence the consumer’s evaluation about the product. At the same time, the inhabited space can decrease the psychological distance among the users in an virtual environment [24]. So, we also want to know whether the inhabited space in the customization configurator can decrease the psychological distance between the users and the customized products. If this effect existed, then the inhabited space may enhance the endowment effect in the online customization so that the consumer may get more from the feeling of ‘I designed it myself’.

While most studies about the online customization configurator focus on the customizable product itself, we highlight the space design in this customization context. Actually, this paper is the initial step to explore the environment design in the online configurator, which contributes to the design science of online customization. And this paper also discusses the psychological distance between the consumer and the customized product. The empirical results may help to understand how the inhabited space helps to customize a good product.

Moreover, our research also has practical implications for practitioners. Our research results provide the insights about how to design an interactive configurator in online customization.

2 Theoretical Background

2.1 Inhabited Space

Hornecker and Buur [18] suggested that the inhabited space can enhance the quality of interaction in virtual world. They define that the inhabited space is the context where interaction takes place, which refers to the degree of being situated in a meaningful place. So a high degree of inhabited space is like real space where action takes place through the relevant atmosphere such as sound and visual stimuli. For example, some museum exhibits ancient products with computer-based pictures, videos, as well as recordings; so that the visitors can feel that they are really in the ancient time with this product on the side. Hornecker and Buur [18] also designed an sensoric garden in a public place. They installed a keyboard and audio tools on a path. Visitors walking on this path are just like walk on a real keyboard and can hear the sound the time they step on a key. And in nowadays, we can also see piano steps in some cities.

Besides in physical world, the inhabited space has also been deployed in virtual environment. When we upload our video to YouTube, we can set our background. For example, we can set our video background as a theatre when we upload our own music performance so that the users can perceive that we are performing in a theatre rather than at home.

An empirical study also suggested that inhabited space could enhance the co-experience in the social-media enhanced real-time streaming video [24]. In their study, the authors developed a social median enhance real-time video playing room which enables all participants watching a real-time football game together. In the high inhabited space version, the video is situated in the middle of a virtual football field with the stands around. On the contrast, in the low inhabited space version, the participants only can see the video without any background. The experiment results support the idea that higher inhabited space can decrease the psychological distance between the users in the playing room, which in turn leads to a higher perception of co-experience.

In this paper, we apply the inhabited space concept into our specific customization context. We define the inhabited space in online customization as the context where the customizable product will be used. For example, if the consumer wants to customize a suit to join a college party, the high inhabited space is the background of a party room, while the low inhabited space is a background of an office. So, the party room is a meaningful place with a relevant atmosphere for this consumer.

2.2 Preference

Initially, the researchers considered that the consumers' preferences are well-defined and stable all the time, which is regarded as the premise of customization that the consumers know their preferences well and can freely express the preferences to the companies through the configurator. However, as the following studies suggested, the researchers reach an consensus that the consumers often do not have well-defined preferences [25], and usually construct them during the decision making process [19, 26].

Furthermore, there is another dimension of preference, the preference insight, which represents the degree to which consumers know their preferences, including the stability and clarity of those preferences [21]. Therefore, Simons [21] divided consumers into four groups according to these two dimension of preferences. Consumers in the first group have well-defined preferences and good preference insights, which enables them to judge correctly whether a customized offer fits their preferences. In the second group the consumers have well-defined preferences but poor preference insight. In this condition, the consumers' preferences are stable and clear, but they do not know this, which may lead to customize an unfit product. The third group of consumers has ill-defined preferences but good preference insights. This means that actually the consumers do not have stable and clear preferences, and they also know this situation. So they may accept others' opinion or companies' recommendation easily. Consumers in the fourth group have ill-defined preferences and poor preference insights. These consumers' preferences are unstable and not clear, but they always think that the final customized products fit their preferences. For example, he/she does not distinguish the taste of Coca-Cola and Pepsi-Cola, but he/she believes that Coca-Cola is superior.

Though prior empirical studies suggested that online customization can enhance consumers' preference fit through the online configurator [27], the consumers' ill-defined preferences and poor insight into preferences are key challenges for the companies, and many designing strategies are employed to solve this problem. For

example, a starting solution is a common design to facilitate the customization process [12], and side-by-side comparison is another method to help consumers to generate initial designs [28].

2.3 Psychological Distance

As construal level theory suggests, psychological distance between two objects can influence the level of mental construal. Specifically, people will construe a distant object at a high level which is more abstract and construe a close object at a low level which means more concrete [29].

Generally speaking, there are three kinds of psychological distance: spatial distance, temporal distance and social distance [29]. All these distance have similar meaning in construal level theory. For example, people always use the spatial distance to represent the social distance and temporal distance (for a review see Trope and Liberman's work [29]). It always takes more time for a person to get to a distant place than a close place, which means that the spatial distance represents the temporal distance. And a person always takes a seat far away from another person to indicate the social distance and sits close to a person to show the more intimate relationship. However, though they are related with each other, they have different effect in some respects.

The psychological distance also has effects on consumers' preferences. Trope and Liberman [30] found that when people make decision about a distant object, they will focus on the central features of this product, while pay more attention to the peripheral attributes in the close distance context. Some other studies also suggested that people would give more weight to the most important attribute when they make a distant decision, and would consider all features as the equally important when they evaluate a close object [31, 32]. Furthermore, consuming a product in a distant future leads people to pay more attention to the nonalignable attributes of this product [33]. The authors show two brands of potato chips with the same attractiveness which is tested by a pretest to the participants. One brand is better on its alignable attributes, while the other is designed to be better on its nonalignable attributes. And all the participants are randomly assigned to two conditions: one is to get this brand right after this experiment and the other is to get this product after this semester. The results of this study show that when people choosing a product in a distant future, the nonalignable attributes play a greater role than the alignable attributes. That's because that with the increasing of psychological distance, people would like to represent the product in a high level, more abstract attributes, which meets the requirement of nonalignable attribute comparing.

3 Hypothesis Development

As noted earlier, consumers often have unstable preferences. Specifically, in different context, consumers' preferences may change a lot. For example, in the office, a lady may prefer a modern style cup, while she may keep a cup of cartoon style in her

bedroom. So, when consumers use the configurator to customize a unique product, they may need to specify the environment where the product will be used. Without this, the consumers' preference may be not clear, which lead to a hard decision making during the customization process. Inhabited space enables the consumers to directly know whether the customized product fits the environment so that they can modify their choices in time if necessary. This helps the consumers to customize a higher preference fit product.

Besides, customization configurator provides a try-and-error process for the consumers to create their own products [34]. And the inhabited space makes the consumers can try in a real like environment so that they can design a closer fit between their preferences and the products. In line with prior studies, a higher preference fit between the measured preference and the customized product can generate values to the outcome of customization. So we propose the first hypothesis as follows:

H1: higher inhabited space will lead to closer fit between the measured preference and the customized product attributes, which leads to a higher WTP.

Human beings recognize objects in a holistic way instead of a separated view. So only providing the product itself may cut off the link between the product and the context, leading to a harder choice. Instead, inhabited space makes the design environment more familiar to the consumers. In line with construal level theory, when consumers feel more familiar, then the psychological distance between them decreased.

Furth more, inhabited space makes the design environment more real to the consumers. Then the relevant context can reduce the consumers perceiving of the psychological distance through two factors. One is the real context of the product makes the consumers feels that he is right now using this product, which reduce the spatial distance between the product and the user. The second is the temporal distance. The inhabited space makes the consumers to feel trying the product right now which is very close temporal distance.

According to 'I designed it myself' effect, the more feeling of as the originator of the product, the more benefit is derived from the customization. Therefore, the higher inhabited space leading to a shorter psychological distance between the consumers and the products will also lead to a higher WTP for the product.

H2: higher inhabited space will lead to shorter psychological distance between the consumers and the products, which also lead to a higher WTP for the product.

We also argue that the close distance between the product and the consumer will lead to a high preference fit. Consumers in a close distance situation will focus more on the details and concrete attributes. As we discussed above, in a close distance situation, consumers give almost average weight to each attribute, which means they need to seriously consider all attributes. So he will try more options during the customization process, which means a higher possibility to create a product that fits the preference.

H3: the effect between the inhabited space and consumers' preference fit is partial mediated by the psychological distance between the products and the consumers.

4 Research Method

4.1 Experiment Design

A lab experiment is conducted to test this hypothesis. We recruit 60 university students who are randomly assigned to 2 groups. A flower vase customization configurator is developed as the experiment stimuli. The participants are told that they need to customize a little flower vase which will be placed on their bedroom desk. They can customize the frame, color, and pictures on the vase. The high inhabited space group is a configurator with a bedroom picture as the background, where the customizable vase is on the lab desk, and the low inhabited space group is only a vase configurator with no background. All the options for each attribute of the vase are generated from a real website. The bedroom background with a simple decoration is chosen among 10 pictures from a 10 persons' pretest. And in line with prior study, we limit the number of options for each attribute to prevent information overload [8].

4.2 Participants and Procedures

All of the participants are indicated that they need to customize a flower vase which will be put on their bedroom's desk through this website. When the participants arrived at the laboratory, they are randomly assigned to the two groups. We will record all of the customization process for further analysis. When finish the customization, they are asked to answer some questions. Each participant will be paid by 20 RMB and a chance to win the vase customized by himself/herself, which is worth about 200 RMB.

4.3 Measurement of Variables

We modify the items used in Lim's work to measure the inhabited space [24]. We adopt the method to measure the preference fit from prior studies [27, 35]. And the psychological distance measure is from Lim's work [24]. We also measure the willingness to pay (WTP) for the customized products by using an open ended question.

4.4 Data Analysis and the Result

The hypotheses are supported by this experiment results.

5 Conclusion

5.1 Theoretical Contribution

This paper contributes to the configurator design in online customization. This is an initial step to explore the space effect in the customization context. As prior researches most focused on the customizable product itself, the result of this paper may remind us paying attention to the customization environment. As the atmospherics of a mall or a

supermarket are well discussed in the prior studies, the online atmospherics also influences the consumers' behavior [13, 36]. And we consider this is more important in the online customization context than in the normal electronic purchasing context because this online configurator is not only a place for consumers to buy a product but also a place for them to interact with the companies and the products. The inhabited space provides context cues for the consumer to the trial-and-error process. The mediating effect also contributes to the construal level theory.

5.2 Practical Implication

This paper has significant implications for the online customization companies. As the inhabited space can increase the consumers' perception of preference fit, the customization companies can provide many backgrounds for their configurator so that the users can set the backgrounds according to their own purchasing goals. Moreover, the websites can provide the function that the consumers can upload their own pictures to the configurator as the background. And the companies should also collect the data about how and where the consumers use their products so that they can provide the appropriate inhabited space for consumers. And as the result that closer distance may lead to a higher preference fit suggests, the online customization websites may provides some functions to decrease the psychological distance between the products and the consumers. For example, they can give a quicker delivery so that the consumers can get the product in a near future.

5.3 Limitation and Future Research

Though the empirical results support the hypotheses, there are still some limitations. First, all the measurement in this paper is self reported. Actually, in virtual world some objective data should be collected to test these hypotheses. Second, only one product category is discussed in this paper. In the future research, we should extend the product categories so that the results get a higher generalizability.

This paper shows that the inhabited space can influence the consumers preference fit in the online customization context. In the future, we can explore more atmospherics factors, such as the music, and the interaction effect between these different atmospheric factors.

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