Choice Overload Effect on Webpages

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Introduction

People face all kinds of decision-making tasks every day. Whether it's deciding for dinner, choosing what favor of coffee to start a new day, or spending more time reading a book rather than taking a break. They all involve the process of selecting one option from several possibilities (Eysenck & Keane, 2020). It is easy for customers to have the misconception that the more choices available the better the shopping experience is. Indeed, having a large number of choices increases the likelihood of allowing customers to find the desired product, thus satisfying their shopping needs (Iyengar & Lepper, 2000), making the purchase more intrinsically motivating (Zuckerman et al., 1978, as cited in Iyengar & Lepper, 2000), and avoiding customers' feeling of uncertainty if all the available choices are presented (Greenleaf & Lehmann, 1995; Karni & Schwartz, 1977, as cited in Chernev et al., 2015). However, having a large number of choices, especially when the complexity of making choices increase, might no longer continue to maximize customers' satisfaction level (Iyengar & Lepper, 2000). In fact, the more complex the decision-making process is, the higher risk people will be perceiving from whether to remain the same choice, looking for new ones, or do not choose at all (Dhar, 1997; Shafir, Simonson, & Tver-sky, 1993; Shafir & Tversky, 1992, as cited in Iyengar & Lepper, 2000). Even if people bear with the frustration to continue making a selection, over-choice will lead to a higher chance of relying on personal heuristics rather than a thorough thinking process (Payne, 1982; Payne, Bettman & Johnson, 1988, 1993; Timmerman, 1993; Wright, 1975, as cited in Iyengar & Lepper, 2000). Choice overload refers to the scenario in which the decision-maker faces an overwhelming decision problem result from an excessive number of choices (Simon, 1955; Toffler, 1970, as cited in Chernev et al., 2015). Not all the time when decision-

makers face a large number of choices count as choice overload. The effect has to fulfill a few preconditions for the choosers to experience cognitive fatigue and impaired. According to Scheibehenne, Greifeneder, and Todd (2010), the decision-makers must not have a clear prior preference of any of the options, or they can quickly locate their preferred item and pay less attention to the remaining ones. Secondly, all the choices have to be perceived as equivalent in terms of quality and values. With a few ones being outstandingly better than the other ones, decision-makers are more likely to make an optimal decision than feeling frustrated and overwhelmed (Scheibehenne et al., 2010). The last precondition is that, when people are less familiar with the choice set, they are more likely to feel overwhelmed. In other words, if the choosers are expert or extremely familiar with the options, they can more easily filter out the unwanted ones (Scheibehenne et al., 2010). Webpages, as one of the platforms, can easily be packed with an overwhelming amount of information due to the various needs from different roles in a design team (Krug, 2014). To avoid over-feeding information to the users, such as how Cotton Bureau displaying all of the United Pixelworkers T-shirts on a single page, this study will be focusing on investigating the ideal format for presenting a large number of choices on a website. Throughout the study, an experiment will be conducted to test the optimal format of presenting all available choices to the users. The purpose and goal of this research are to provide a guideline for user experience designers based on current scientific research articles.

Emotional Outcome

As mentioned before, having a large number of choices does not necessarily create a pleasant decision-making process for the choosers. Several negative outcomes can occur through people browsing the large variety of choices and then making a selection from all possibilities. Decision-makers can feel more responsible for the choice they make, thus resulting in more

frustration (Iyengar & Lepper, 2000) and dissatisfaction (Botti & Iyengar, 2004, as cited in Chernev et al., 2015) toward their choices. Iyengar and Lepper (2000) conducted three experiments to test the impact of choice overload on customers in daily tasks, including purchasing chocolates from an extensive number of choices (24 flavors) or a limited six choices at a grocery store. The study found that participants who had the 24-favor choices reported being more dissatisfied and more regret about the choices they made compare with those with limited choices. In addition, carrying the negative emotions toward making the selection might result in a lower willingness of engagement and perceive the options to be less attractive (Gilovich & Medvec, 1995, as cited in Iyengar & Lepper, 2000). Scheibehenne, Greifeneder, and Todd (2010) conducted a meta-analysis experiment that revealed one of the factors that determine choosers' cognitive status and emotional reaction is the trade-off between choices. The similarity between the available choices and if choosing any particular one involves trade-off can potentially affect people's choice satisfaction, regret, and motivation (Hoch, Bradlow, and Wansink 1999; Kahn and Lehmann 1991; Simonson 1990; Van Herpen and Pieters 2002; Zhang and Fitzsimons 1999, as cited in Scheibehenne et al., 2010), especially if that particular option contains some unique characteristics that cannot be directly comparable to the remaining ones (Chernev 2005; Gourville & Soman 2005, as cited in Scheibehenne et al., 2010). Undoubtedly, the trade-off process can increase the difficulty level of choosers making a decision and is more likely to trigger negative emotions such as frustration and regret. The individuals who did not experience choice overload are more likely to feel more confident that they chose the best option (Hayness, 2009, as cited in Chernev et al., 2015) given that fewer trade-off decisions they have to make along the entire process. To ensure customers are gaining a pleasant and satisfying shopping experience that encourages them to shop again at the same site, user experience

designers should avoid having them processing trade-off decisions and overwhelming them with an enormous amount of information at one time.

Assortment and Categorization

Among all factors that moderate the effect of choice overload, assortment and categorization play an important role in assisting choosers to perceive all choices differently and bear the less cognitive burden (Diehl, 2005). Assortment refers to the format of breaking down all the options into a series of choices with fewer numbers at each time (Besedes, Deck, Sarangi, and Shor, 2015) for better readability and less cognitive load (Chernev et al., 2015), especially when choosers are unfamiliar with the domain of choice (Diehl 2005; Diehl, Kornish, and Lynch 2003; Huff- man and Kahn 1998; Russo 1977, as cited in Scheibehenne et al., 2010). There are multiple advantages of having a large assortment. First, assortment changes the perception of smaller choice sets without changing the actual number of choices available. The total number of choices still remains abundant while the choice range narrows down to a smaller number each time (Besedes et al., 2015). With a large variety of options, customers are more likely to find a close match to their desired product (Baumol & Ide, 1956; Hotelling, 1929, as cited in Chernev et al., 2015) thus enhances the enjoyment of the shopping experience (Botti & Iyengar, 2004, as cited in Chernev et al., 2015). Secondly, choosers can bear less cognitive strain compare to those who have no or less assortment as each subgroup contains fewer options that make the decision-making process easier and lighter (Besedes et al., 2015). In addition, using assortment implicitly stimulate choosers to think of the best option from each subgroup. This can effectively avoid the status quo bias, in which people tend to maintain the same decision rather than changing them (Eysenck & Keane, 2020). With assortment, decision-makers are more likely to make optimal decisions because they are paying more attention to a fewer choice at each time and are less

likely to carry the previous decision to a new set (Besedes et al., 2015). Categorization, as another important feature that moderates the impact of choice overload, refers to the process of grouping items by their attributes (Alba, Hutchinson, and Lynch 1991; Bettman 1979; Howard and Sheth 1969; Huber and Kline 1991; Johnson and Payne 1985; Nedungadi 1990; Roberts and Lattin 1991, as cited in Mogilner, et al., 2008). It serves the function of allowing the choosers to identify the similarities within the same category as they are based on the most prominent traits of the item (Clark, 1985; Grice, 1975, as cited in Mogilner, et al., 2008). Using categorization, the decision-makers can refine their choices (Chakravarti and Janiszewski 2003; Diehl, Kornish, and Lynch 2003; Ratneshwar and Shocker 1991; Rosen 1978; Zhang and Fitz- simons 1999, as cited in Mogilner, et al., 2008) by quickly locating to the category that their desired product with less cognitive burden throughout the process (Diehl, 2005). It is not only a cognitive process that aids the choosers in locating their desired products in a faster and easier way, but also is a perceptual process in which customers can infer the difference between this particular item from the other ones in a different category (Mogilner, et al., 2008). Moreover, choosers are relatively more willing to choose options under different categories due to the fact that the difference is prominent, rather than choose from homogenous options that make the tradeoff between the options unclear to them (Festinger 1964; Tversky & Shafir 1992, as cited in Mogilner, et al., 2008). This invisible restraint can result in a higher possibility of decreased sense of self-determination and lower satisfaction perceived by the choosers, thus reduce their enjoyment from the outcome (Deci & Ryan, 1985; Ryan & Deci, 2000, as cited in Mogilner, et al., 2008). In other words, more categories can increase customers' perception of a great variety of options, result in an increase in self-determination and the sense of more freedom in deciding, and eventually raise the overall satisfaction of the decision-making process (Mogilner, et al., 2008).

Method

To test whether assortment, categorization or the combination of both can help the users with a faster and more satisfying decision-making process, thus boosting the overall shopping experience, a research experiment will be conducted to investigate the optimal condition. The goal of this study is to examine the ideal format of presenting a large number of choices on a website. To test the effect of each factor, a total of 400 students will be recruited from colleges across the entire state. Compensations will be provided for all participants after the study as an incentive for participants to join and an encouragement of a friendlier test environment. The two IVs (independent variables) are categorization and assortment. The outcome variables are the time taken for the customers to find the desired product and their overall satisfaction with the entire shopping experience, as these are usually the most crucial components of a pleasant user experience and can directly determine customers' willingness to visit the same site again.

Participants are required to complete a pre-study survey to report their familiarity with the domain of choice as this is one of the direct preconditions of choice overload (Scheibehenne et al., 2010). To ensure all participants are not familiar with this domain so that they can quickly filter out the unwanted results, those who report having high familiarities in the survey will be eliminated from the following study. To exclude the impact of time constraint and task difficulty on choice overload, all participants will be given the same tasks with a fixed time length for this study. A pretest will not be provided to avoid pretest sensitization, which pre-exposes participants to the content, therefore, raise their familiarity with the topic (Crano et al., 2014).

In this study, all participants will be asked to browse a webpage that contains choice overload on a computer and make a selection based on personal preference. This study will be a between-groups experiment where participants are randomly assigned to one of the four

conditions, 1) neither assortment nor categorization, 2) assortment only, 3) categorization only, or 4) having both assortment and categorization and will be asked to make a purchase. Participants who are assigned to neither assortment nor categorization condition will be given all the options at once and asked to make a selection. Participants who are assigned to the assortment only condition will be given the same total number of items but with fewer numbers of them at each time. Participants who are assigned to the categorization condition will be given all of the items at once but under their belonged categories. Finally, participants who are assigned to have both assortment and categorization will be making a selection with the aids of both features. As this study aims to examine the most ideal format of presenting a large amount of content on a webpage, the two outcome variables are 1) time taken to find the desired product and 2) customers' overall satisfaction rate. To assess the time taken for them to find the product, researchers will be timing the entire decision-making process, including participants browsing and making a final selection. Outliers such as using an extremely short amount of time in shopping or excessive than usual will be eliminated from our consideration. At the end of the study, participants will be provided with a series of questions to evaluate their overall satisfaction rate across the entire experience. Questions include how they would rate the overall experience, if they would recommend this website regarding the design and layout, to their family and friends, if they would personally come back to shop at this website again, etc., will be mentioned in the survey. Participants will be reporting their satisfaction score on a 5-point Likert scale, 1 as being the negative extreme (extremely unsatisfied / never recommend / never come back) and 5 as being the positive extreme (extremely satisfied / very likely to recommend / very likely to shop again).

The study result will be analyzed with a 2 (assortment: yes vs. no) x 2 (categorization: yes vs. no) factorial ANOVA. Researchers will be comparing the time spent and satisfaction score across the four conditions. The mean of users' time taken to find the desired product and their satisfaction score will be calculated and organized in a 2 x 2 table. A factorial ANOVA will be introduced to test if there's a statistically significant difference between the four conditions. Assuming there is a significant difference, a Post Hoc test will be then used to determine the best condition(s) among the four. If the best condition and the second best are not statistically different from each other, it's reasonable to infer that one variable plays a more important role in predicting the outcome variable.

Predicted Results

The predicted result would be a negative correlation between the time taken to find the desired product and the satisfaction rate. The predicted relationship between IV1 (categorization) and DV 1 (time) is negative, meaning that with the help of categorization, customers should spend less time on finding the desired product. The predicted relationship between IV2 (assortment) and DV 1 (time) is also negative, meaning that the use of assortment will help the customers to find the goal in a shorter time. On the opposite, the predicted relationship between the two IVs (assortment and categorization) and DV 2 (satisfaction) is positive. It is anticipated that, with less time customers spend on looking for the desired product, they should be feeling more satisfied with the experience. If the process took them a long time in finding the target, customers are more likely to feel frustrated, thus become less satisfied and discourages a repeated shopping. It is predicted that the combination of having both assortment and categorization helps the best for the online shopping experience, as one of them is to present a fewer number at each time and another one implies the attribute of merchandise. Based on the

conclusion, websites should be implementing both assortment and categorization when presenting all the merchandise to customers, especially when the amount is enormous and overwhelming.

Discussion

The underlying application of this study can be prominent in the field of user experience and web design. Researchers and designers should be considering the most optimal format of presenting information online, especially when the website contains large and similar varieties. To avoid dissatisfaction, frustration, regret, and even unwillingness to shop at the same site again, companies should be careful of overfeeding information without categories and labeling. When designers are not sure if the content is perceived as overwhelming or distracting to customers, conducting a quick usability testing is always beneficial in gathering feedback and understanding what needs to be fixed. Helping customers feel light and satisfied with the online browsing process can completely boost their impression of the entire brand.

Limitations

There are multiple underlying limitations in the study that might affect the analysis and final conclusion. The most prominent one is the individual difference between each participant. Some customers prefer to take their time in paying attention to the details of products and spending longer time reading them. Whereas the fast shoppers might generally browse around and make a quick selection. Even though researchers can ask questions such as report your average browsing time on a daily basis in a pre-study survey, participants might not have an accurate answer as the activity sometimes can be unconscious browsing. This leads to another potential limitation of the study, it is hard to tell if people stopped browsing because they've found the desired product, were thinking of something else, or feeling exhausted. Similar to the

previous limitation, researchers neither cannot interrupt the participant and ask for an explanation of the current behavior, nor rely on subjective understanding. It is challenging for researchers to interpret their behaviors and the rationale behind them. Moreover, how user-friendly the platform is can also influence customers' willingness of browsing and purchasing. A user-unfriendly platform can greatly hinder customers from spending more time on it, not even saying to encourage a thorough decision-making process and a pleasant experience. Even though all the choices are categorized and chunked into smaller groups, customers can be trapped by a buggy interface thus eager to leave the website. The last one is regarding how familiar the participants are with the domain of choice. As mentioned previously, it is ideal that all of them are not familiar and expertise in the tested domain so that they don't have a clear preference in mind beforehand. However, being extremely unfamiliar with the domain can be interpreted as they are not interested in it. It is possible that those who are not interested in the content might quickly make a selection regardless of the total amount of choices and if they are categorized.

Conclusion

This study is devoted to investigating the ideal format of presenting a large number of choices on a website. Two variables, time taken for the customers to find the desired product and their overall satisfaction score, were examined to reflect their perception of choice overload. This study specifically focused on the impact of assortment and categorization due to the fact that these can directly change customers' perception and emotional reaction of encountering an enormous number of choices. Assortment, which refers to the format of breaking down all the options into a series of choices with fewer numbers at each time (Besedes et al., 2015), limits how much customers can see each time. Categorization groups the items with similar traits (Alba, Hutchinson, and Lynch 1991; Bettman 1979; Howard and Sheth 1969; Huber and Kline

1991; Johnson and Payne 1985; Nedungadi 1990; Roberts and Lattin 1991, as cited in Mogilner, et al., 2008) for faster and easier search. Both factors moderated the impact of choice overload by presenting all available choices under the corresponding category and smaller subgroups at each time. The predicted results showed a negative relationship between the two IVs and time taken, meaning that both features should help users to find the target in a shorter time. However, it is predicted that both IVs have a positive relationship with the overall satisfaction score because with the assistance of both features, customers can easily make a selection thus become more satisfied with the shopping experience. The findings can be beneficial to the user experience field because no matter the content designers need to present, customers are likely to make an impression and judgment based on the first look at the interface. With a disorganized and cluttered screen, it is possible that they will be less patient and satisfied with the experience. Designers should be considering using features such as assortment and categorization to assist users in browsing an organized and less-distracting environment.

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