The Role of Choice Set Size on Consumers’ Preference For Unconventional Goods

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We assess if and how the number of options available in a choice set affects preferences. We find that consumers are more likely to choose a more unconventional product when choosing from larger choice sets than from smaller choice sets.

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EXTENDED ABSTRACT
Choice set size and composition have been the topic of much consumer research in recent years (for a review see Chernev 2011). To-date the majority of the work on this topic has examined the experience of choosing from larger versus smaller choice sets, revealing both advantages and disadvantages. For example, although larger choice sets have been shown to increase option value, flexibility, opportunities for variety, perceptions of choice freedom, and enjoyment related to the overall shopping experience (Kahn, Moore, and Glazer 1987; Simonson 1990; Kahn and Lehmann 1991; Kahne-man and Snell 1992; Ratner, Kahn, and Kahne-man 1999; Botti and Iyengar 2004; Shin and Ariely 2004), they also lead to increased consumer cost, higher rates of choice deferral, choice overload effects, increased choice difficulty, and lower choice satisfaction (Broniare-zyk, Hoyer, and McAlister 1998; Iyengar and Lepper 2000; Schwartz et al. 2002; Chernev 2003).

However, relatively little work has investigated the effect of choice set size on the specific option chosen. Some work has demonstrated that larger choice sets lead to greater variety-seeking and diversification (Read and Loewenstein 1995; Kahn and Wansink 2004). Additionally, Sela et al. (2009) found individuals are more likely to choose easy-to-justify options, such as virtuous products over vice products, in larger choice sets compared to smaller choice sets (Sela, Berger, and Liu 2009). The authors suggest that larger choice sets increase choice difficulty, inducing consumers to focus their decision process on choosing an option supported by good reasons. This suggests that larger choice sets can induce different psychological strategies to deal with choice.

In this paper, we assess whether consumers are more likely to choose an unconventional product in a larger choice context than in a relatively smaller one. Simonson & Nowlis (2000) find that providing reasons for choice promotes more unconventional choices. This occurs because reasons for expressing uniqueness are easier to think of, more accessible, and more persuasive (Simonson and Nowlis 2000). Based on the findings of both Sela et al. (2009) and Simonson & Nowlis (2000), we propose that consumers should be more likely to choose unconventional options in larger choice sets than in small choice sets due to a greater reliance on reason-based choice.

In three studies we demonstrate that larger choice sets lead to more unconventional choices compared to smaller choice sets. We show this main effect across ice cream flavor choice in two studies, and through choice shares of a compromise option in a third study. We rule out any moderating effects for two individual-level variables: Need for Uniqueness (NFU) (Snyder and Fromkin 1977) and Intolerance of Ambiguity (IOA) (Budner 1962). Taken together, our empirical findings suggest that choice set size is an important situational variable in determining choice.

STUDY 1
In this study, we show the main effect—that larger choice sets increase choice shares for more unconventional options relative to smaller choice sets. We demonstrate this effect over ice cream flavors. Participants were randomly assigned to one of two choice set size conditions (Large vs. Small). Participants in the Large condition evaluated twelve ice cream flavors, half of which were identified in a pretest as more unconventional, while participants in the Small condition evaluated four ice cream flavors, again half of which were more unconventional. All participants were asked to choose one flavor to purchase. Our dependent variable of interest is the type of ice cream flavor selected (unconventional or conventional). In addition to our dependent variable, we also measured choice difficulty, IOA, and participant demographics (gender and age). We predicted that participants would choose more unconventional choices in the larger choice set condition.

Pretest
Fifty participants were asked to rank order fifteen ice cream flavors from most conventional to least conventional. Conventionality was defined by the number of people that would be predicted to choose each flavor, such that the more popular flavors were to be identified as more conventional. The ice cream flavors with the lowest average rankings on this pretest were identified as the more conventional flavors, while the flavors with the higher average rankings were identified as the less conventional flavors. For example, the ice cream flavor that had the lowest average ranking (most conventional) was Cookie Dough (\(M_{\text{rank}} = 5.56\)), while the flavor that had the highest average ranking (most unconventional) was Honey Avocado (\(M_{\text{rank}} = 12.14\)).

Method
Two-hundred participants (\(M_{\text{age}} = 35.2\) years, 55.5% male) on Amazon’s Mechanical Turk (mTurk) were randomly assigned to one of two choice set size conditions (Large or Small). All participants were asked to imagine they were choosing an ice cream flavor to purchase. Participants in the Large condition evaluated twelve flavors, while participants in the Small condition evaluated four. The Small choice set was a subset of the twelve flavors used in the Large condition. The flavors used for the Small condition were randomized across participants such that all participants in the Small condition saw a different subset of flavors. We used this method so that across participants in the Small condition all possible combinations of flavors were evaluated, thus controlling for potential individual differences in flavor preferences.

Half of the ice cream flavors were unconventional (as identified in the pretest) while the other half were more conventional. The flavors were not explicitly labeled as conventional or unconventional for participants, instead participants were given the names of the flavors and a brief description. Our dependent measure of interest was whether a participant chose an unconventional ice cream flavor. We also measured choice difficulty (“How difficult was it for you to choose a single flavor to purchase?”) and a subscale of the IOA scale related to the preference for novelty (sample question: “What are we used to is always preferable to what is unfamiliar”).

Results and Discussion
Participants in the Large choice set condition were significantly more likely to choose an unconventional flavor than participants in the Small condition. Specifically, participants in the Large condition chose an unconventional flavor 37.8% of the time, while participants in the Small condition chose an unconventional flavor only 20.6% of the time ((1) = 7.15, \(< 0.01\)). We also found that choice difficulty was rated higher (more difficult) in the Large condition than the Small condition (2.43 vs. 1.93, t(190.13) = -2.39, \(< 0.02\)). Finally, we ran a logistic regression of unconventional choice (1 = chose an unconventional flavor, 0 = chose a conventional flavor) on a dummy variable in determining choice.
variable for the Large condition, choice difficulty, IOA index, and participant controls. This analysis shows a significant positive effect for the Large condition (β = 0.97, p < 0.01) such that participants in the Large condition were more likely to choose an unconventional flavor than participants in the Small condition. This effect holds even controlling for choice difficulty (β = 0.01, p > 0.10), and individual-level differences in IOA (β = -0.55, p > 0.10).

These results provide initial evidence that larger choice sets lead to different choices than smaller choice sets. Specifically, consumers making a choice in a larger choice set are more likely to choose an unconventional option than consumers making a choice in a smaller choice set. While larger choice sets lead to more choice difficulty, increased choice difficulty does not significantly affect unconventional choice shares. Thus, choice difficulty did not mediate our effect.

**STUDY 2**

In Study 1, half of the options were unconventional flavors and half were conventional flavors. However, it’s possible consumers perceive the choice set differently depending on the choice set size as well as the composition of the choice set (e.g., ratio of conventional and unconventional options), leading to different choices. In order to ensure that the effect from Study 1 is not specific to a certain ratio of unconventional to conventional choices within a choice set, we designed Study 2 to directly manipulate the ratio of unconventional flavors.

**Method**

Participants (N = 605, M_{age} = 35.2 years, 55.5% male) on mTurk were randomly assigned to one of four between-subjects conditions (Size: Large, Small; Ratio: Half, Fourth). The Large-Half and Small-Half conditions were equivalent to the Large and Small conditions in Study 1. Participants in the two Large conditions viewed twelve ice cream flavors, while participants in the two Small conditions viewed four flavors. In the Large-Fourth and Small-Fourth conditions, the choice sets were comprised of one-fourth unconventional flavors (i.e., three flavors in the Large-Fourth condition and one flavor in the Small-Fourth condition). The Small conditions were again a subset of the Large conditions as in Study 1. Further, the flavors were identified as unconventional or conventional via the same pretest described above.

We predict that the main effect for choice set size found in Study 1 was not the result of the composition (half conventional vs. half unconventional). Thus, we hypothesize that there will be no significant interaction between choice set size (Large vs. Small) and choice set ratio (Half vs. Fourth) and that we will replicate our finding that participants choose more unconventional choices (across both the Half and Fourth conditions) in large choice sets than in small choice sets. Our dependent measure of interest is again unconventional choice share. In addition to this measure, we also measure choice difficulty.

**Results and Discussion**

We ran a logistic regression of unconventional choice (1 = chose an unconventional choice, 0 = chose a conventional flavor) on a dummy variable for the Large choice set conditions, a dummy variable for the Fourth ratio conditions, and the interaction between choice set size and ratio. We found no significant interaction between choice set size (Large vs. Small) and ratio (Half vs. Fourth), b = -0.62, (1) = 1.98, p = 0.16. As expected, we did find a significant main effect of choice set size (Large vs. Small) controlling for ratio (Half vs. Fourth). Overall, 25.0% of participants in the Large conditions chose an unconventional choice, compared to only 18.0% of participants in the Small conditions, b = -0.44, (1) = 4.61, p < .05.

Additionally, we found a significant main effect of ratio: participants were significantly more likely to make an unconventional choice in the Half condition versus the Fourth condition, b = -1.41, (1) = 23.81, p < 0.001. These effects hold when controlling for the significant positive effect of choice difficulty (β = 0.21, p < 0.01) and participant demographics (β = 0.41, p < 0.04; = -1.06, p < 0.001). As in Study 1, choice difficulty did not mediate our effect.

Overall, Study 2 replicates the findings from Study 1 regarding choice set size. Specifically, we still find that participants are significantly more likely to choose an unconventional choice in the larger choice set than in the smaller choice set. Study 2 also extends the findings of Study 1 by demonstrating that this main effect is not specific to the ratio of unconventional to conventional options available within the choice set.

**STUDY 3**

While Studies 1 and 2 have shown the main effect of choice set size on the preference for unconventional options, they did so in one product category (ice cream). We seek to replicate this finding over a different product (televisions) and through a different operationalization of conventionality (preference for a compromise option). In their work on unconventional choices, Simonson & Nowlis (2000) operationalize unconventional choice as choice for a non-compromise option. Specifically, because the compromise option is the least extreme option in a choice set, it is more conventional relative to the non-compromise options. Following this set-up, we measure preference for compromise options between small and large choice sets. We hypothesize that individuals will be more likely to choose a compromise option in a smaller choice set relative to a larger choice set.

**Method**

Participants (N = 390, M_{age} = 33.3 years, 53.3% male) on mTurk were randomly assigned to one of two choice set size conditions (Large, Small). Participants in each size condition were then further randomly assigned to either a “2-Group” or “3-Group” option set, creating a total of four between-subjects conditions. The 2-Group and 3-Group conditions are necessary to measure the compromise effect. Specifically, in order to assess whether the compromise effect exists in both choice set size conditions, we have to compare shares for the compromise option when it’s in a binary choice set-up (2-Group) to shares for the compromise option when it is in a trinary choice set-up (3-Group). The number of options varied across all conditions. Participants in the Small-2-Group condition viewed two options; participants in the Small-3-Group condition viewed three options; participants in the Large-2-Group condition viewed eight options; and participants in the Large-3-Group condition viewed twelve. The Small conditions represent the traditional compromise effect set-up. In each condition, participants are asked to imagine they are buying a television that varies is picture quality and price. The televisions vary from lower price/lower quality to middle price/middle quality (compromise options) and to higher price/higher quality. In the 2-Group conditions, participants chose between the middle price/middle quality option(s) and the higher price/higher quality option(s), while in the 3-Group conditions the lower price/lower quality option(s) were added to the set. The compromise effect exists if participants are more likely to choose the middle price/middle quality option(s) in the 3-Group conditions than in the 2-Group conditions. In the Small conditions, there is one television model for each price/quality tier. This option is randomized from the full set of options (represented by the Large-3-Group condition). In the Large conditions, there are four options for each price/quality tier. Thus,
the choice of any of the four middle price/middle quality options is considered a compromise choice.

To measure if participants are less sensitive to the compromise effect (and thus less likely to choose conventional options), we measure the difference in the shift in choice share for the middle price/middle quality option(s) between the 2-Group and 3-Group conditions for the Small choice set and for the Large choice set size separately. We hypothesize that participants in the Small condition will be more likely to choose the compromise option in the 3-Group condition than in the 2-Group condition (e.g., the classic compromise effect) but participants in the Large condition will not be more likely to choose the compromise option. This pattern would support our claim that participants choose conventional options more in smaller choice sets than in larger choice sets.

While our main dependent measure is the difference in the compromise effect between the Large and Small conditions, we also measure choice difficulty and participant demographics (age and gender) as in the previous studies. Further, we also included the NFU Scale in case this individual difference variable moderates the effect of choice set size on the compromise effect. We would expect a possible moderation since individuals who have higher NFU scores are more likely to choose less conventional options overall.

Results and Discussion

We found a marginally significant interaction between choice set size (Large vs. Small) and option set (2-Group vs. 3-Group), \( b = 0.88, (1) = 3.62, p = 0.057 \). Simple effect analysis revealed that participants were significantly more likely to choose the compromise option in the 3-Group option set than in the 2-Group option set in the Small condition, \( b = 0.65, (1) = 4.22, p = 0.04 \); however, they were directionally less likely to choose the compromise option in the 2-Group option set in the Large condition, \( b = -0.24, (1) = 0.49, p = 0.48 \). This significant interaction suggests that the compromise effect is reduced in larger choice sets, which can also be thought of as a reduction in the choice of a conventional option.

Looking at choice difficulty, there is a main effect of choice set size on choice difficulty ratings such that participants in the Large conditions find making a choice more difficult than participants in the Small conditions (3.32 vs. 2.55, \( t(367.443) = -4.69, p < 0.001 \)). However, if we run a logistic regression predicting choice of a compromise option (1 = choose a compromise option, 0 = did not choose a compromise option) from a dummy variable for the Large choice set conditions, a dummy variable for the 3-Group option conditions, an interaction between the Large conditions and the 3-Group option conditions, and choice difficulty, we see that choice difficulty has a significant positive effect on the probability of choosing a compromise option (\( 0.27, p < 0.001 \)). This means that greater choice difficulty leads to a higher probability of choosing a compromise option. The opposite pattern that we would expect if choice difficulty was the reason why participants were choosing more conventional options. Yet, even controlling for the significant positive effect of choice difficulty, the interaction between the Large dummy variable and the 3-Group dummy variable is significantly negative (\( -1.00, p < 0.05 \)). This implies that the decrease in the compromise effect is due specifically to the contextual choice set size variable separate from changes in choice difficulty.

We also ran two similar models of the regression described above, also including the NFU Scale. We evaluated two models: one with a three-way interaction between Large choice set size, the 3-Group option set, and the NFU Scale and one with no three-way interaction, just the NFU Scale as an independent measure. The first model found no significant three-way interaction (\( p > 0.10 \), suggesting that NFU does not moderate the effect of the Large choice set size on the compromise effect. The second model did show a significant negative effect of NFU on choice of the compromise option (\( -0.54, p < 0.05 \)). This implies that individuals with higher NFU are less likely to choose a compromise option overall. However, the interaction between the Large choice set size and 3-Group option set still remains significant and negative (\( -1.03, p < 0.05 \)) even when including the NFU Scale. This suggests that choice set size still significantly reduces the compromise effect even when controlling for individual-level differences in NFU.

Overall, Study 3 has replicated the main effect of choice set size on the preference for unconventional choice options in a different product category and via a different operationalization of conventionality. Further, the finding that larger choice sets reduce the compromise effect is not moderated by NFU or diminished when controlling for either choice difficulty or NFU. This suggests that choice set size has an independent and separable effect that is specific to the number of options available.

GENERAL DISCUSSION AND CONCLUSION

Across three studies we have demonstrated that larger choice sets lead to a greater preference for unconventional items relative to smaller choice sets. We have shown this effect in two product categories (ice cream and televisions) and across two operationalizations of conventionality (an independent pretest and the compromise effect). We also demonstrated that this effect is not attributable to changes in choice difficulty or individual-level differences in NFU or preference for novelty.

In our studies, we only examined two relative choice set sizes (four versus twelve). It is possible that the difference in preferences may be attenuated with smaller or larger choice sets. Further, we were only able to rule out potential mechanisms for the difference in conventional choice share between choice set sizes (choice difficulty, NFU) and we were not able to specifically identify a mechanism for the main effect of choice set size. While we hypothesize that this is the result of a greater reliance on reasons and the preeminence of reasons related to uniqueness, we have not confirmed this empirically. Despite these limitations, this paper still contributes to the literature on choice set size and provides compelling evidence that choice set size significantly affects preference and can explain why consumers experience negative post-choice outcomes. The results of this paper have strong implications for marketers determining which options and how many options they should have in stock.

REFERENCES


