Short Report

Buying Behavior as a Function of Parametric Variation of Number of Choices

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There is accumulating evidence that having many options from which to choose may be counterproductive (Iyengar & Lepper, 2000; Iyengar, Well, & Schwartz, 2006; Schwartz, 2004). In the consumer world, Procter & Gamble noticed a 10% increase in sales of its Head & Shoulders brand after they reduced the number of varieties (Goldstein, 2001). Iyengar and Lepper (2000) carried out three experiments in which subjects had to choose from a small set of 6 options or from a larger set of 24 or 30 options. Subjects rated the situation with more options as more pleasant than the situation with fewer options, but purchased more when there were fewer options and were more satisfied with their choices.

Most previous research on this topic compared only two set sizes for number of choices: a medium value, such as 6, and a large value, such as 24 (but see Iyengar, Jiang, & Huberman, 2004). We were interested in exploring the influence of number of choices in a more parametric fashion. Several processes might influence buying behavior as the number of choices increases. Presumably, as the number of choices increases, consumers are more likely to find an item that meets their needs. If this is the only process involved, then increasing choice should lead to increased buying. However, as choice increases, consumers are more likely to have two or more items that meet their criteria and are close to one another in subjective value, making the choice difficult. Also, as the number of options increases, the cognitive effort in evaluating those options increases (Keller & Staelin, 1987). We predicted that the interaction of these proposed processes would lead to an inverted-U-shaped function; that is, we predicted that as the number of choices increased, buying would initially increase and then decrease.

For the product in our experiment, we chose pens, a commodity that college students are interested in and often purchase. We varied the number of options from 2 to 20 in increments of 2.

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METHOD

Subjects

We received permission from our institutional review board to collect data from subjects without prior consent. We set up a table in a high-traffic corridor connecting the two major sections of Dartmouth's library. As people passed, we encouraged them, one at a time, to rate a set of pens. One hundred people participated in the main experiment. The vast majority were Dartmouth undergraduates. An additional 20 Dartmouth undergraduates participated in a preliminary rating study.

Materials

We purchased two dozen of each of 20 different pens. The pens all had roller-ball delivery systems and came from several different manufacturers. We selected only pens that had black ink and that ranged in cost from $1.89 to $2.39. Despite these restrictions, the pens differed markedly in appearance, feel, and mechanism. Before the main experiment, 20 subjects rated each of the 20 pens on a scale from 1, *highly undesirable*, to 10, *highly desirable*. Each subject rated each pen twice in random order. The ratings were averaged to produce a single rating for each pen. We used those ratings to choose the pens that would be included in each set of options.

Procedure

For the main experiment, we set up a table in the library corridor and invited passersby to help us choose pens. They were told that the Department of Psychological and Brain Sciences was planning to buy several hundred pens for its supply closet and wanted to buy the best possible pens. The number of pens on the table varied from 2 to 20 in increments of 2. For the set of 2 pens, we included the top-rated pen from the preliminary ratings and the 10th-rated pen. For each successively larger set, we included the options in the previous set (as in Iyengar & Lepper,

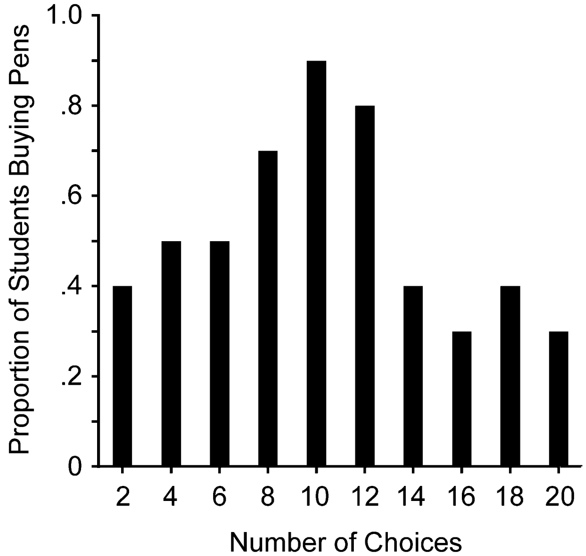

Fig. 1. **Proportion of subjects who bought any pens as a function of the number of choices available.**

2000) and added 2 more pens, a relatively high-rated pen and a relatively low-rated pen.

Each subject was asked to select the pen that he or she liked best. That choice was recorded. The subject was then informed that the pens were all in the \$2.00 range, but that as a token of our appreciation, he or she could buy any pens on the table for \$1 each. Whether or not a pen was purchased was the primary dependent measure.

RESULTS

Figure 1 presents the proportion of subjects who purchased a pen as a function of set size. We used two statistical analyses to test our prediction that there would be a curvilinear relation between number of choices and buying behavior. First, we carried out a logistic regression analysis with number of choices as a first-order and as a second-order polynomial. The overall model was significant, $\chi^2(2) = 9.17$, $p = .01$, corrected $r = .342$. The linear component was significant, Wald $\chi^2(1) = 5.35$, $p = .019$, as was the quadratic component, Wald $\chi^2(1) = 7.051$, $p = .008$. Second, we grouped the number of choices into three bins (the lowest three, the middle four, and the highest three) and carried out a chi-square test comparing the proportion of subjects who purchased a pen across these three bins. The effect of number of options was significant, $\chi^2(2, N = 100) = 9.722$, $p = .008$, $\varphi = .312$.

DISCUSSION

As we hypothesized, buying behavior was a curvilinear function of number of choices, peaking at a value of 10 pens. Our data are consistent with the findings of Iyengar and Lepper (2000), as an additional 20% of subjects purchased pens when there were 6 choices, compared with when there were 20; but examination of the more complete function yields a slightly different conclusion, namely, that more choice does not always lead to less buying. Rather, it is only after the optimal point has been exceeded that more choice results in less buying. Quite possibly, the peak and shape of the function would vary depending on the product, although we predict that many functions relating purchasing to number of choices would be curvilinear.

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