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**The Dual Nature of Choice: When Consumers Prefer Less to More**

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## *Abstract*

Economists typically assume that more choice is better, and consumers are more likely to purchase from a larger choice set. However, marketing and psychological studies show this is not always the case. This paper reports results from experiments designed to further investigate the so-called excessive-choice effect. First, we investigate whether people would voluntarily reduce their choice set size. Second, we investigate whether the excessive-choice effect, found in previous studies, is robust to changes in experimental design. Third, we explore how personality influences preferences for choice set size. Results show that the excessive-choice effect indeed exists for some people, but on average people prefer greater choice.

## I. INTRODUCTION

The standard economic model of the consumer assumes that utility is weakly increasing in choice set size. If more choices are available, consumers can reconsider their purchasing behavior, either discovering a consumption bundle yielding higher utility or remaining at the old bundle and utility level. Despite the intuitive and logical appeal of such a model of decision making, recent empirical evidence suggests it may be unfounded.

In a widely publicized study, Iyengar and Lepper (2000) found that a larger percentage of consumers purchased specialty jams and chocolates when presented with a small number of varieties (i.e., 6) as opposed to a larger number (i.e., 24 or 30) and that students were more likely to complete an extra credit essay assignment when given 6 essay topics as opposed to 30. Schwartz (2004a) also found that employees are more likely to invest in 401(k) retirement plans when offered fewer funds to choose among. Further, several studies have found that a lower assortment size either increases or does not significantly change supermarket sales (e.g., Boatwright and Nunes, 2001; Broniarczyk, Hoyer, and McAlister, 1998; Dreze, Hoch, and Purk, 1994). Not only are consumers less likely to make a purchase from a larger choice set, they are often less satisfied after consuming a good chosen from a larger choice set (e.g., Iyengar and Lepper, 2000). The phenomenon uncovered by these studies is termed here as an

*excessive choice effect*, where greater choice either does not change or lowers the expected utility of a choice opportunity.

The excessive choice effect has important implications for firm behavior, economic theory and public policy. For example, psychologists have interpreted the excessive choice effect as a motivation for public policy to reduce freedom of choice. For example, Schwartz argues (2004b, p. 71), “As the gross domestic product more than doubled in the past 30 years, the proportion of the population describing itself as “very happy” declined by about 5 percent, or by some 14 million people...Of course, no one believes that a single factor explains decreased well-being, but a number of findings indicate that the explosion of choice plays an important role.” Elsewhere, Schwartz concludes that “unduly influenced by the ideology of economics and rational-choice theory, modern American society has created an excess of freedom, with resulting increases in people's dissatisfaction with their lives and in clinical depression. One significant task for a future psychology of optimal functioning is to deemphasize individual freedom and to determine which cultural constraints are necessary for people to live meaningful and satisfying lives” (Schwartz, 2000, abstract).

Although economics is often described as the study of constrained choice, economists have been surprisingly silent on the excessive-choice effect. The excessive-choice effect need not contradict standard economic models if search costs are non-negative (Norwood, 2006); however, a better understanding of individuals’ preferences

for freedom of choice is needed, especially in light of the broad reaching implications being drawn by some regarding the relationship between societal welfare and the excessive-choice effect.

Although the aforementioned evidence suggests that the optimal choice set size is finite, it is unclear whether subjects are aware of the excessive-choice effect. While consumers are apparently less likely to make a purchase from a larger choice set, it is an entirely different question as to whether an individual would voluntarily reduce the size of a choice set with no compensation. If individuals believe more choice is always better, but simultaneously shy away from large choice sets, public policies aimed at reducing choice as a means to increase well-being are unlikely to be successful. Economists frequently appeal to the notion of revealed preference in that an individual makes a choice of one good over another if it improves their utility. If subjects voluntarily prefer less choice to more, this provides a clear indication that the excessive-choice effect exists.

In addition to the issue of whether the excessive-choice effect is a result of overt cognitive processes, it is unlikely that the effect is omnipresent for all consumers. It has been suggested that preferences for choice set size interacts with personality (e.g., Schwartz et al., 2004a and Schwartz, 2004b). No study to the authors' knowledge has tested how personality interacts with individual behavior when presented with a different number of choices. Clearly, such a finding would have important

ramifications for how economists should incorporate the excessive choice effect into micro-economic models of individual decision making.

In this paper, we conduct several experiments delving further into the excessive choice effect by investigating individuals' willingness to voluntarily reduce choice set size and to determine the degree of heterogeneity in the excessive-choice effect. In our first experiment, individuals were simply asked to make a choice between two choice sets that differed in the number of varieties of a specialty soda. In the second experiment individuals chose between choosing one specialty soda out of a choice set and two dollars in cash, where the soda choice set size was varied from 6 to 24. In our final experiment, individual were given the right to choose a soda from a set of specialty sodas, and we elicited individuals' selling prices for the choice, again varying the choice set size from 6 to 24. Results suggest that the psychological and economic literatures are not in conflict. As the psychological evidence suggests, some individuals do indeed prefer less choice to more. However, consistent with the assumption of most economic models, on average subjects preferred more choice to less. Descriptions of the experiments and associated results follow; the last section provides a summary and further comments.

## **II. A SIMPLE QUESTION OF CHOICE**

Previous studies have documented cases where consumers are more likely to purchase an item from a small choice set than from a large choice set, suggesting the optimal

choice set may not be the largest. Individuals may be able to directly indicate how many choice options they prefer. However, it may be that people say they prefer large choice sets, but are less likely to purchase from large choice sets, suggesting that the excessive-choice effect is a subconscious phenomenon. Some evidence for this hypothesis exists. For example, Iyengar and Lepper (2000) found that grocery shoppers were more attracted to tasting booths for exotic jams when 24 varieties were present instead of 6. Despite this, a larger percentage of consumers purchased from a choice of 6 varieties compared to 24.

To investigate this issue, a simple experiment was conducted with 48 students enrolled in an undergraduate economics class. Students were informed they would be given a free drink upon exiting class and turning in an exam. The drink was a variety of Jones Soda, a specialty soda made in Seattle, Washington that sells for about \$1.70 in stores like Panera Bread. This particular soda was chosen because students, in this college town, could not easily purchase this brand of soda outside the experiment and because there are about 28 varieties, all with distinct flavors.

Students were told that the drinks would be outside the classroom displayed on a table. On one side of the table were 24 Jones Soda varieties, and on the other side were 6 varieties. Before leaving the classroom, the students were asked to indicate whether they would like to choose their soda from the set of 24 or the set of 6 (or they could choose not to accept a drink at all). Subjects had to make their decision prior to



observing the sets and students were not allowed to change their answer once they left the classroom. Furthermore, they were informed that the particular items included in the smaller choice set were randomly selected from the larger set. Since the students took an exam this day, their exit from the classroom was staggered, eliminating the possibility that some might choose the smaller choice set to avoid long lines.

Of the 48 students present, 3 opted not to accept a drink, and 19 elected to choose from the limited choice set of 6 varieties, instead of the larger choice set of 24 varieties. Thus, of those who accepted the free drink, 42% preferred the smaller choice set. While more choice was preferred to less on average, a significant portion preferred less choice.

This simple experiment is quite revealing. Previous studies have relied on observed purchase rates between large and small choice sets to make inferences about the excessive choice effect. To our knowledge, this study provides the first demonstration that a non-negligible fraction of the population might voluntarily reduce freedom of choice. Apparently, the excessive-choice effect is not just a subconscious phenomenon, less choice can be better for some people and these people willingly reduce the size of their choice set, knowing full well that such a reduction would result in a lower probability of them finding a most preferred variety.

### **III. CHOICE SET SIZE AND PURCHASING BEHAVIOR**

As mentioned, several previous studies have documented cases where subjects were more likely to make a purchase from a small choice set than a large choice set. This

implies that expanding the choice set size may decrease the expected utility of a choice opportunity. Since this would contradict the standard economic model of the consumer, it is important that similar experiments be conducted to determine the robustness of the excessive-choice effect.

Our second experiment is based loosely on the three experiments reported in Iyengar and Lepper (2000) where subjects were allowed to choose an item at a cost. Their choice set sizes varied across subjects from 6 to 24-30. In all three experiments a higher percentage of subjects purchased from the small choice set. Our experimental design is purposefully different in many respects from that in Iyengar and Lepper (2002). If the excessive choice effect is a pervasive phenomenon that should be incorporated in economic models, the effect should be robust to a variety of settings.

In this experiment, we again use specialty soda as the good of interest. A booth was set up in the lobby of a campus building and students passing by were offered \$5 and a free gift to participate in an economic experiment. On a table were varieties of the Jones Sodas, described in the previous section. Subjects were given the choice of one free soda from the varieties shown or \$2 in cash. Students were randomly assigned to one of two treatments. In one treatment, subjects were given a choice of 6 varieties and in the other treatment 24 varieties were available. The particular items in the small and large choice set were randomly interchanged to prevent the influence of one potential variety.<sup>1</sup>

A total of 155 individuals participated; 65 presented with 6 varieties and 90 with 24 varieties. When faced with 24 soda varieties, 30% chose the soda, compared to 12% of those presented with 6 varieties (see table I). T-tests indicate these differences are statistically significant at the 1% level.

In our experiment, more choice was better. These results contrast with the findings of Iyengar and Lepper (2000). In their study of specialty jams, Iyengar and Lepper (2000) found that only 3% of consumers purchased when 24 jam varieties were available whereas 30% purchased from the limited offering of 6 jam varieties. These findings suggest the excessive choice effect may not be as robust as argued by some.

#### **IV. CHOICE AND PERSONALITY**

The two previous experiments documented that while some individual might prefer smaller to larger choice sets, on average, subjects in our study preferred more choice to less. Psychological research has documented how personality differences can lead to different preferences for choice set size. In particular, Schwartz et al. (2002) argued that people tend to exhibit either “maximizer” or “satisficer” character traits.

At one end of the personality spectrum are maximizers, who seriously consider all the alternatives, strive to make the optimal choice, and frequently revisit their choice to determine whether it was indeed optimal. At the other end are satisficers, who set standards for what they want and make their selection when those standards are met, regardless of whether all options have been considered. Satisficers also seek goods that

yield high utility, but they differ from maximizers in that they are, “content with merely excellent as opposed to the absolute best,” (Schwartz, 2004b, p. 78).

Satisficers rarely revisit their choice, care little if they discover an alternative choice was better, and experience little regret over their choices. Maximizers tend to experience regret over their choices, are less happy in life, and experience higher depression rates (Schwartz, 2004b). No study to the authors’ knowledge has tested how the behavior of maximizers and satisficers differ when presented with a different number of choices. Is the excessive-choice effect more pronounced in maximizers or satisficers? In one sense, maximizers may value choice more than satisficers because it gives them greater opportunities to make the best choice, which is their ultimate objective. On the other hand, greater choice presents a more tasking problem to the maximizer, and may lead to greater regret. It is plausible that maximizers may avoid making decisions in the presence of a large choice set to avoid the cognitive burden and regret, and therefore may demonstrate a larger excessive-choice effect than satisficers. To answer these questions, an experiment is conducted to detect how the value of greater choice differs across the maximizer-satisficer personality spectrum.

Schwartz et al. (2002) developed a scale to measure where an individual’s personality lies on the maximizer / satisficer spectrum. Consisting of thirteen questions, this scale is illustrated in Table II. Each question asks the individual to rate on a scale of 1-7 the extent to which they agree with a statement. The maximization score is obtained

by summing the ratings across all thirteen questions. The minimum possible score is 13 and the maximum is 91. The higher the score, the more one resembles a maximizer and the less one resembles a satisficer. As a rule of thumb, a score of 65 or higher indicates a maximizer and a score of 40 or lower identifies satisficers (Schwartz, 2004b).

To investigate whether these personality traits interact with the excessive choice effect, we conducted another experiment similar to that described in the previous two sections. In particular, a booth was set up in the lobby of a campus building and students passing by were offered \$5 and a free gift to take a survey and participate in an economic experiment. On a table were varieties of the Jones Sodas.

Participants were asked to complete a short survey that contained the thirteen questions to measure where each individual lies on the maximizer / satisficer spectrum, plus a question regarding gender. After completing the survey, students were given a choice of one Jones' Soda from a choice set, where the choice set size varied randomly across individuals from 6 to 24. Subjects were given the opportunity to sell their choice using the Becker-DeGroot-Marschak (BDM) mechanism.

Subjects were asked to indicate the minimum price at which they would forego their soda choice. After this price was stated, individuals drew a random number from a hat. The random numbers ranged \$0.10 to \$4.00 in increments of \$0.10. If the selected random number was greater than or equal to the individual's stated selling price, they sold their choice at a price equal to the random number, otherwise, they chose a soda

from the varieties (either 6 or 24) on the table. The survey instrument explained that the best strategy was to submit a selling price equal to the minimum price subjects were willing to accept to give up their soda choice.

The BDM Mechanism is incentive compatible, meaning individuals have a dominant strategy to submit a selling price equal to their value of the soda choice. Some individuals were given a choice of 24 varieties, and others only 6 varieties.<sup>2</sup> If the average bid is higher or not statistically different under the 24 variety scenario, the average individual prefers more choice to less, and the excessive choice effect hypothesis is rejected. In this experiment, subjects revealed both their maximization score and the exact value of their soda choice, allowing one to calculate the excessive choice effect as a function of the maximization score.

A total of 122 individuals participated in the experiment; 71 facing 6 varieties and 51 facing 24 varieties. As table III shows, the average bid of \$1.82 for those facing 6 varieties is greater than the average bid of \$1.72 for those presented with 24 varieties. However, t-tests reveal this difference is not statistically different from zero at the 5% or 10% level. More choice neither increased nor decreased the value of the choice opportunity.

To estimate the relationship between personality and the excessive choice effect, the following ordinary least squares regression was estimated

$$(1) \text{ Bid}_i = \beta_0 + \beta_1(D24_i) + \beta_2(\text{MaxScore}_i) + \beta_3(D24_i)(\text{MaxScore}_i) + \alpha_4(\text{Male}_i) + e_i$$

where  $Bid_i$  is the  $i^{\text{th}}$  individual's selling price in dollars. The variable  $D24_i$  equals one if the individual was presented with 24 varieties and zero if 6 varieties. The variable  $MaxScore_i$  equals the individuals maximization score divided by 100 and  $Male_i$  is a dummy variable for males.<sup>3</sup> Estimates are reported in table IV. The significantly negative value of  $\beta_3$  suggests that the choice effect is lower for maximizers than satisficers. The effect of greater choice is given by the derivative of bids with respect to  $D24_i$ , which equals

$$(2) \quad \text{Choice Effect}_i = \frac{\partial Bid_i}{\partial D24_i} = \beta_1 + \beta_3(MaxScore_i) = 2.2933 - 3.9038(MaxScore_i).$$

The significance of both coefficients in (2) indicate that maximizers value greater choice less than satisficers; maximizers prefer less choice and satisficers prefer more. If an excessive-choice effect exists, the sign of (2) will be negative, indicating that increasing choice from 6 to 24 leads individuals to decrease their bids. If the value of (2) is greater than or not significantly different from zero, the excessive-choice effect is not present. Of course, the value of (2) depends on the individual's maximization score.

The variance of the linear function in (2) equals

$$(3) \quad V(\beta_1) + V(\beta_3)(MaxScore_i)^2 + 2(MaxScore_i)cov(\beta_1, \beta_3) = \\ 1.2582 + 3.5075(MaxScore_i)^2 - 2(MaxScore_i)2.0722$$

where  $V$  is variance and  $cov$  is covariance.

Equations (2) and (3) are used to graph the choice effect as a function of personality in figure I. For extreme satisficers with scores less than 40, the choice effect is significantly positive, and for extreme maximizers with scores greater than 75 the choice effect is negative. Between these two extremes the choice effect is not significantly different than zero.

Thus, whether more choice is better or worse depends where individuals lie on the satisficer / maximizer spectrum. Figure II provides a histogram of the maximizer scores for all subjects in the choice experiment and BDM auction. Most subjects have scores between 40 and 70, indicating that for most individuals more choice is neither better nor worse. A few individuals with high maximization scores place a discount on greater choice, and a few place a premium. For this sample, the excessive-choice effect exists only for extreme maximizers. The remainder, and majority of the sample, either placed a premium on or were indifferent to greater choice.

## V. SUMMARY

Conventional economic models assume that more choice is better, yet recent psychological evidence suggests otherwise. This study reports results from three experiments suggesting that both economists and psychologists are correct. Indeed, when offered the option of a free gift from a large or small choice set, about 40% voluntarily reduced their choice set size without compensation. For such individuals, less choice was better.



However, a majority of people prefer larger choice sets. Contrary to experiments by Iyengar and Lepper (2000), we find that a larger percentage of subjects purchased a specialty item from a large choice set than a small choice set. Thus, while some individuals preferred less choice, the average individual preferred large choice sets.

A third experiment confirms the hypothesis offered by Schwartz that preferences for choice set size depends on whether individuals exhibit maximizer or satisficer traits. As the choice set size grows, maximizers require less compensation to forego a choice opportunity. The psychologists are correct. In some instances more choice does not improve welfare, and the effect of a larger choice set size does depend on the individual's personality. The experimental results suggest that economists are also correct. On average, consumer utility is weakly increasing in the number of options available. While the standard economic model of the consumer is not applicable to every single individual--and was probably never meant to be--it can be used to describe the behavior of the average person and to assess the overall societal welfare implications of public policies.

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## Footnotes

1. The experiment was carried out in one day. During the times 9:10-9:40 AM and 1:20-2:00 PM there were 24 varieties, and during the times 9:45-11:00 AM and 2:00-2:30 PM there were 6 varieties.
2. The experiment was conducted all in one day. During the times 9:15-10:45 AM and 2:00-2:45 PM 24 varieties were presented, and during the times 10:45-11:45 AM and 2:45-3:15 six varieties were presented.
3. With this normalization, the maximization score exists in the range (0.13, 0.91).

**Table I.** Descriptive Statistics of Choice Experiment

	Percent of People Choosing Drink Over \$2 in Cash
Individuals Presented with 6 Varieties (N = 65)	12%
Individuals Presented with 24 varieties (N = 90)	30%

Notes: The t-test for the null hypothesis of no difference between the percentages in the six and 24 variety set is  $\frac{0.30 - 0.12}{\sqrt{\frac{0.3(1-0.3)}{90} + \frac{0.12(1-0.12)}{65}}} = 2.80$ , and is asymptotically normally distributed with a mean zero and unit variance. The p-value for the test is less than 1%.

**Table II.** Maximization Scale Developed by Schwartz et al. (2002)

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**On a scale of 1-7, with 1 being completely disagree and 7 being completely agree, indicate the extent to which you agree with each of the following statements.**

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1. Whenever I'm faced with a choice, I try to imagine what all the other possibilities are, even ones that aren't present at the moment.
  2. No matter how satisfied I am with my job, it's only right for me to be on the lookout for better opportunities.
  3. When I am in the car listening to the radio, I often check other stations to see if something better is playing, even if I'm relatively satisfied with what I'm listening to.
  4. When I watch TV, I channel surf, often scanning through the available options even while attempting to watch one program.
  5. I treat relationships like clothing: I expect to try a lot on before I get the perfect fit.
  6. I often find it difficult to shop for a gift for a friend.
  7. Renting videos is really difficult. I'm always struggling to pick the best one.
  8. When shopping, I have a hard time finding clothing that I really love.
  9. I'm a big fan of lists that attempt to rank things (the best movies, the best singers, the best athletes, the best novels, etc.).
  10. I find that writing is very difficult, even if it's just writing a letter to a friend, because it's so hard to word things just right. I often do several drafts of even simple things.
  11. No matter what I do, I have the highest standards for myself.
  12. I never settle for second best.
  13. I often fantasize about living in ways that are quite different from my actual life.
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**Table III.** Descriptive Statistics of BDM Soda Auction

	Average Bid	Standard Deviation of Bids
All Individuals (N = 122)	\$1.78	\$0.99
Individuals Presented with 6 Varieties (N = 71)	\$1.82	\$0.91
Individuals Presented with 24 varieties (N = 51)	\$1.72	\$1.10

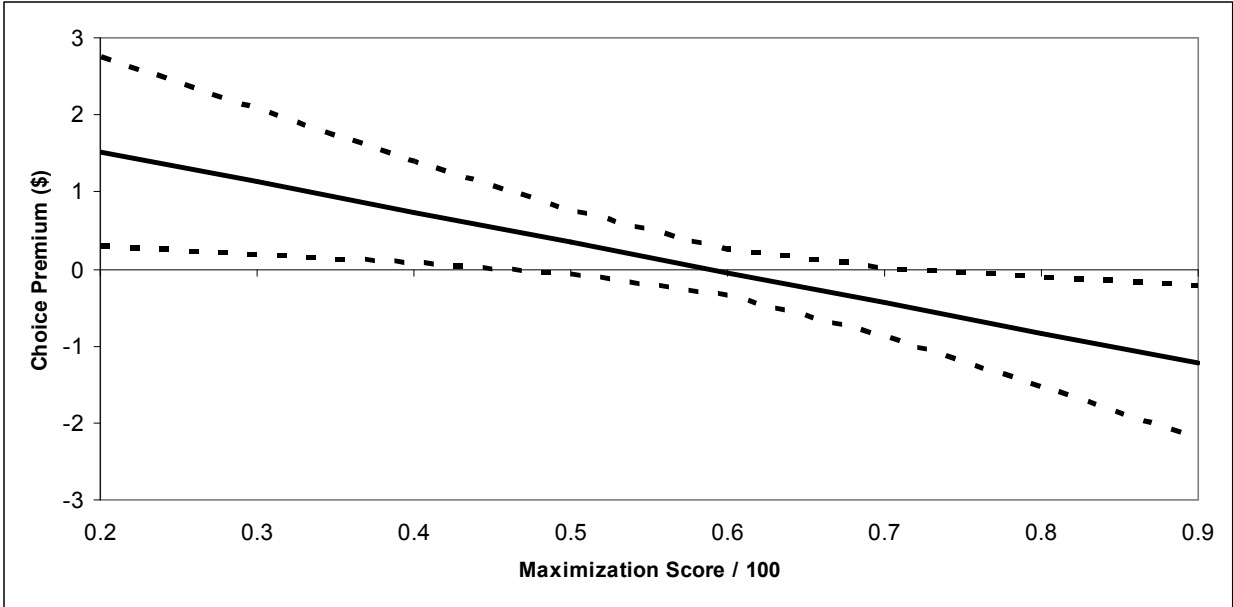
Notes: The difference in average bids for the two variety treatments is  $1.82 - 1.78 = 0.04$ . Assuming normality, the variance of this average is  $0.91^2/71 + 1.10^2/51 = 0.0354$ . The test-statistic for the null hypothesis of no difference in average bids is then  $0.04/(0.0354)^{0.5} = 1.13$ , which cannot be rejected at the 10% level.

**Table IV.** Regression Analysis of BDM Auction Bids (Sample Size = 122)

	<i>Parameter Estimates (Test Statistic)</i>
Intercept ( $\beta_0$ )	1.1489 (1.70)*
$D24_i$ ( $\beta_1$ )	2.2933 (2.05)**
$MaxScore_i$ ( $\beta_2$ )	1.3650 (1.25)
$D24_i * MaxScore_i$ ( $\beta_3$ )	-3.9038 (-2.08)**
$Male_i$ ( $\beta_4$ )	-0.3216 (-1.74)*

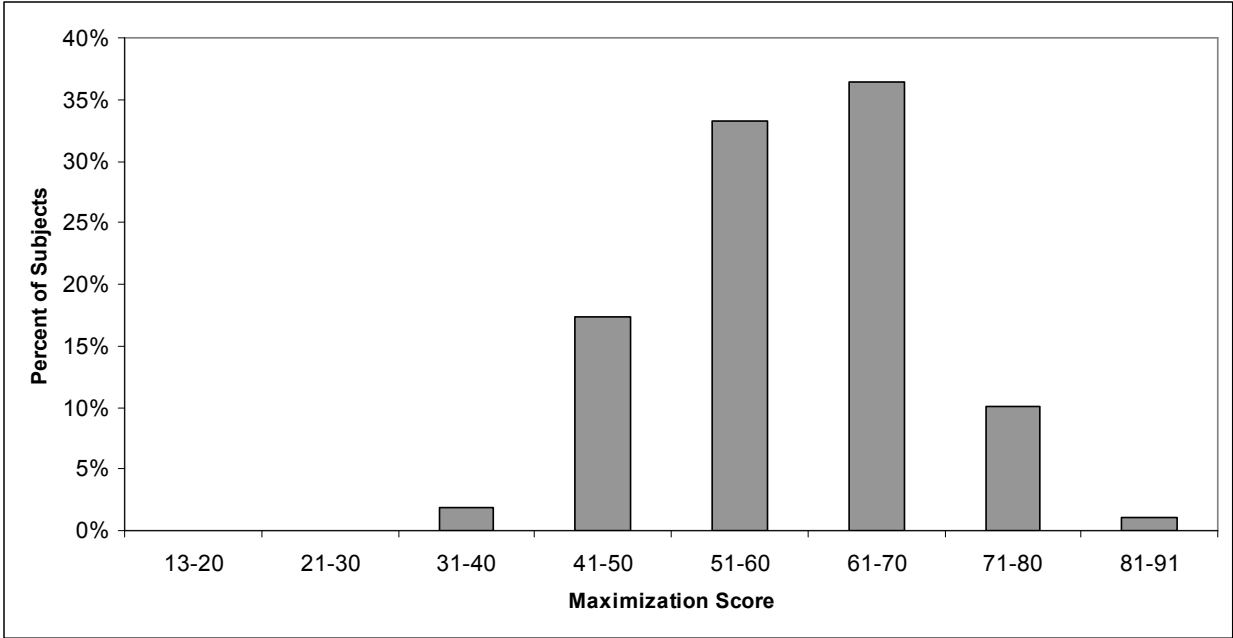
\* and \*\* denote significance at the 10% and 5% level, respectively.





**Figure I.** Choice Premium in BDM Auction as a Function of Maximization Score

Notes: Graph shows the change in value of soda choice when the number of choices increases from 6 to 24. The solid line is the point estimate and the dotted lines denote a 95% confidence interval.



**Figure II.** Distribution of Maximization Scores In Choice Experiment and BDM Auction (Sample Size = 277)