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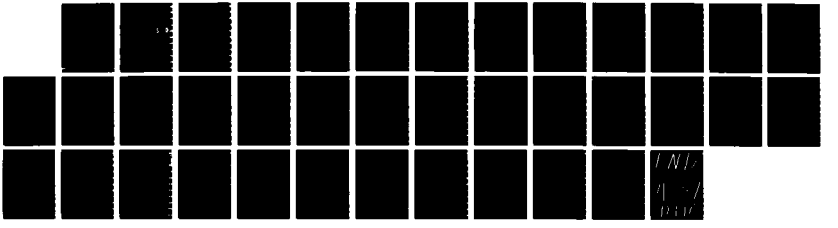

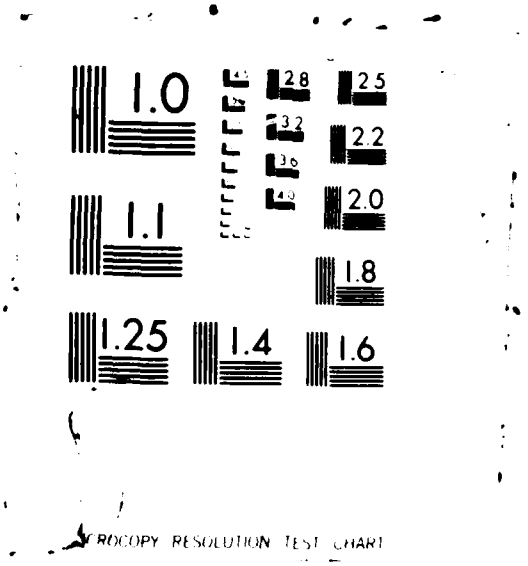
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RISK PREFERENCE AND ASPIRATION LEVEL

LOLA L. LOPES AND SANDRA L. SCHNEIDER

WHIPP 27 FEBRUARY 1987

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Subjects' preferences among a set of six multi-outcome lotteries were measured under three conditions. In the neutral condition, no payoffs were applied. In the low aspiration condition, all subjects who "won" an average of $80 or more on a set of three of their preferred lotteries won $2. In the high aspiration condition, the two subjects "winning" the largest amounts on a set of three of their preferred lotteries won prizes of $15

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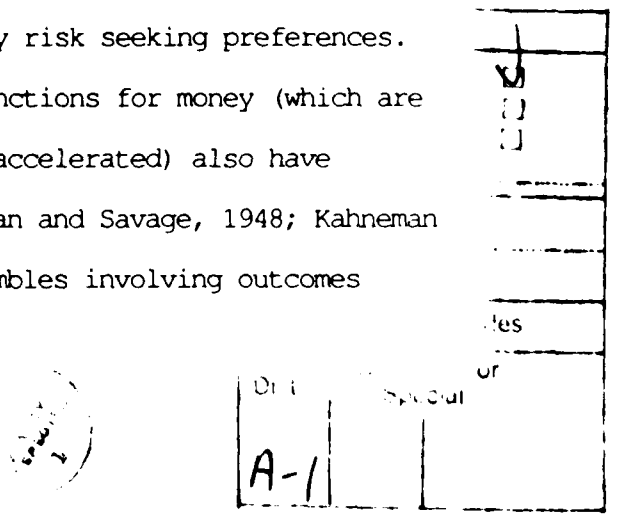
and $5. Of 89 Ss, slightly more than half were highly responsive to the aspiration manipulation becoming more risk averse (relative to the neutral condition) under the low aspiration condition and becoming risk seeking under the high aspiration condition. The remaining subjects were totally unresponsive to the manipulation. These results are discussed in terms of Lopes' (in press) two-factor theory of risky choice.

Since the time of Daniel Bernoulli, theories of risky choice have focused primarily on risk aversion. In the simplest case, risk aversion is a preference for having the expected value of a gamble or lottery rather than the gamble itself. More generally, risk aversion can be seen as a preference for gambles in which, all else being equal, the probability mass is shifted toward the mean outcome.

Risk aversion is both common and dramatic. Even if we ignore the famous St. Petersburg game (Bernoulli, 1967/1738) in which a gamble having infinite expected value is typically judged to be worth very little, it is not difficult to find situations in which most people are willing to give up a large fraction of a gamble's expected value in exchange for a sure thing or a gamble that has lesser variability among outcomes. There are, however, some situations in which people are risk seeking. Recreational gambling in casinos and state lotteries provides a case in point. Another is the willingness of people to accept risky alternatives rather than face certain or near-certain losses. (Fishburn & Kochenberger, 1979; Hershey & Schoemaker, 1980; Kahneman & Tversky, 1979; Williams, 1966).

Economists and psychologists working within the tradition of expected utility theory have postulated two mechanisms to explain why risk averse individuals sometimes display risk seeking preferences. One possibility is that their utility functions for money (which are conventionally assumed to be negatively accelerated) also have regions of positive acceleration (Friedman and Savage, 1948; Kahneman and Tversky, 1979; Markowitz, 1952). Gambles involving outcomes



spanning these regions of positive acceleration would then be predicted to be preferable to their expected values or to actuarially equivalent gambles spanning narrower regions within the same range. The other possibility is that small probabilities are overweighted relative to larger probabilities and to certainty (Kahneman & Tversky, 1979). This would cause "longshot" gambles that offer a small probability of a large outcome to be preferred to their expected values or to "safer" but actuarially equivalent gambles involving smaller outcomes and larger probabilities.

Although such explanations are taken by most modern-day economists to have only "as if" status (Arrow, 1951; von Neumann and Morgenstern, 1947; Friedman and Savage, 1948), psychologists in concert with classical economists typically interpret utility and probability weighting functions in terms of people's subjective (or psychophysical) responses to money and probability (Bernoulli, 1967/1738; Kahneman & Tversky, 1979, 1984; Marshall, 1948; Menger, 1934). In this view, neither risk seeking nor risk aversion has anything to do with <u>risk</u> as such nor (for that matter) does either choice pattern entail intentional seeking or avoidance behaviors. Instead, the patterns of preference that we label "risk aversion" and "risk seeking" are merely byproducts of the way we perceive the relative magnitudes of money and of probability.

An alternative viewpoint has recently been advanced by Lopes (in press). In this view, risky choice involves the joint influence of two factors. The first factor, <u>security</u>/<u>potential</u>, is a bipolar

factor that represents a dispositional tendency either to pay most attention to bad outcomes when evaluating risky options (security seeking) or to pay most attention to good outcomes (potential seeking). Taken alone, security seeking predicts risk aversion and potential seeking predicts risk seeking.

The second factor, aspiration level, represents the degree to which a particular option is likely to yield an outcome at or above the person's current goal or aspiration level. Although aspiration level may also have a dispositional component (with risk averse people having more modest aspiration levels than risk seeking people), its primary function in the theory is to capture the situational influence of current needs or current opportunities on choice.

Aspiration level can produce risk-seeking preferences in ordinarily security-seeking (i.e., risk averse) individuals in two different ways. The first case involves money amounts that are so small that there is little impact of security seeking. Thus, the exchange of a dollar for a lottery ticket allows some hope of achieving a large win (aspiration level) without threatening one's financial status (security seeking) in the event of loss.

In the second case, money amounts are large enough to engage the security seeking mechanism, but the demands of aspiration level do not allow the person to opt for the more secure choice. This pattern is frequently revealed when subjects are choosing among losses (Lopes, 1986, 1987; Schneider & Lopes, 1986). Most subjects, for

example, are unwilling to accept a sure $100 loss (the most secure option) rather than face an actuarially equivalent gamble that threatens them with a worse loss but that also allows them the hope of losing zero or a smaller amount (aspiration level). The only major exceptions to this rule appear to involve gambles with excessively large possible losses (extreme lack of security) or gambles whose best outcomes (i.e., smallest losses) are nearly as bad as the sure $100 loss.

Although risk seeking choices are fairly common among unselected subjects in the domain of losses, they are much more infrequent in the domain of gains. Verbal protocols (Lopes, 1987; Schneider & Lopes, 1986) suggest that this pattern of preferences is due to differences in the subjects' aspiration levels in the two domains. For losses, many subjects hope to achieve values at or near zero; in other words, they hope to achieve <u>better</u> than the expected value. To do this, they must accept gambles that are insecure (i.e., risky). For gains, however, many of the same subjects appear to be satisfied to win relatively small amounts, typically much less than the expected value. Such modest aspiration levels for wins are not inconsistent with security and do not require acceptance of risk.

There are, however, circumstances in which the aspiration levels of normally risk averse individuals are pushed sharply upward even in the domain of gains by special needs or opportunities. Risk-seeking behaviors by subsistence farmers (Kunreuther & Wright, 1979) and by troubled firms (Bowman, 1982) are two such cases in point. A third

might be the "housing lottery" phenomenon of a few years back (Lopes, 1983). In these cases, the desire to achieve some not-easily-attainable positive goal prompts the individual to take risks that would otherwise be avoided.

The study reported here represents an attempt to study such externally driven risk seeking. In particular, we wished to discover how people's risk preferences change under high and low aspiration conditions and whether the changes that occur are appropriate for achieving externally defined goals. In the experiment, we first measured our subjects' preferences for a set of six multi-outcome lotteries, each having an expected value of $100. Then we measured their preferences for the same lotteries under experimentally manipulated low and high aspiration conditions.

Method

Subjects. Subjects were 89 students (28 males and 61 females) who were enrolled in introductory psychology at University of Wisconsin. Students served for extra credit to be applied to their course grades.

Stimuli, task, and design. The stimuli were six multi-outcome lotteries each having an expected value of approximately $100 (see Figure 1). The tally marks represent lottery tickets equal in value to the dollar amounts listed at the left of their rows. Each lottery has exactly 100 tickets. The lotteries include a lottery having a riskless (or sure-win) component (RL), a short shot (SS) giving a fairly good chance of a medium prize, a peaked lottery (PK) having

its mode at the expected value, a rectangular lottery (RC) in which all outcomes are equally likely, a bimodal lottery (BM) with modes at $0 and $200, and a long shot (LS) giving a small chance of winning a very large amount. The lotteries are arranged in the figure (from upper left to lower right) in the order in which they are typically preferred by risk averse persons (Lopes, 1984; Schneider & Lopes, 1986).

Insert Figure 1 about here

The lotteries were presented to subjects in all possible pairs under three different motivational conditions and subjects were asked to indicate which lottery of each pair they would prefer to play if they were given a free choice of either. In the neutral condition, no payoffs were offered and subjects' choices were purely hypothetical. In the low aspiration condition, subjects were told that three of their preferred lotteries would be played and that the amounts of their hypothetical payoffs would determine whether or not they received a $2 prize. This condition was set so that most subjects would be able to win the $2 prize. The final, high aspiration condition was similar to this except that the potential prizes were higher ($15 or $5) and the payoff condition was set so that only two subjects could win.

In each of the three motivational conditions, subjects made choices for three replications of the pair-comparison design. This

gave 45 pair-choices per subject per condition.

Procedure. Subjects were run in groups of about 30 in a small, auditorium-style classroom in sessions that took about 90 minutes. Lotteries were presented using two 35 mm slide projectors arranged so that the lotteries in a pair appeared side-by-side on the projection screen.

The neutral condition was run first. At the beginning of the session, lotteries SS and LS were displayed and the experimenter explained how to interpret them. Subjects were also told that "each lottery has exactly 100 tickets and the total amount of prize money in each lottery is the same." Then subjects were asked which of the lotteries they would prefer to play if they were allowed to draw a single ticket from either and keep the prize associated with it. After subjects responded, two additional practice pairs were presented (RC vs. RL and BM vs. PK) and subjects indicated a choice for each pair.

After the instructions were complete, the experimental pairs were presented. Subjects indicated their choices by circling either the word "left" or the word "right" on an answer sheet according to whether they preferred the left or the right member of each pair. Lottery pairs were blocked by replication. Pairs within replication were arranged randomly but with the restriction that the same lottery not appear in three consecutive pairs. Left/right position was counterbalanced over lotteries. Pairs were presented for approximately 15 seconds each with a 5 second blank slide after every

fifth pair.

The low aspiration condition was run next. Subjects were instructed as follows:

> We are going to go through the pairs again and you are going to make choices just as before. When we are done, each of you will select at random three pairs....Then we will look to see which lottery in each pair you preferred. You will then draw a ticket from each of your three preferred lotteries. We will determine how much you would have won if we had been playing these at full value. Every subject who averages $80 or more for their three draws will be paid $2 in addition to their experimental credit. Obviously there is some luck involved both in drawing the pairs and in drawing the lottery tickets. Nevertheless, you should be careful in making your choices and remember that your goal is to average $80 or more for your three lottery choices.

This particular payoff scheme was constructed so that subjects choosing conservatively (i.e., choosing low risk lotteries) could fairly easily meet the $80-average goal. (In fact, only two or three subjects out of each group failed to achieve this goal.)

After the choices had been made, the experimenter and three assistants worked together to evaluate the subjects choices. This was done by sending subjects serially to four different stations. At Station 1, the first assistant helped each student select their pairs by drawing 3 numbered poker chips (without replacement) from a bag containing 45 chips. These were listed on a scoring sheet along with

information about which member of the pair (left or right) the student had previously chosen. At Station 2, the second assistant decoded the pair number and left/right preference to indicate which actual lotteries these choices represented (i.e., RL, SS, etc.) At Station 3, the third assistant helped each student draw 3 numbered poker chips (with replacement) from a bag containing 100 chips and marked these numbers on the scoring sheet, one next to each lottery code. Finally, at Station 4, the experimenter translated the lottery ticket information into hypothetical prize amounts and entered these on the scoring sheet, informing subjects about whether they had achieved the $80 average and won the $2 prize. The procedure took about 15 minutes for the entire group.

After all subjects had been to all stations, the high aspiration condition was begun. Subjects were instructed as follows:

> Well, that <u>previous</u> round was pretty easy to win, although a few people had bad luck. We're going to play one more round, with different rules this time, and maybe those people will have better luck. On this round we're making it hard to win. What we're going to do is the same as before: we're going to show you the pairs of lotteries and let you make your choices. Then, when we're done, we'll choose three pairs and evaluate them just as before. But this time there will only be two prizes. The person whose three draws add to the largest number will get $15, and the person whose three draws add to the second largest number will get $5. As before, there is luck involved.

Nevertheless, you should make your choices carefully and remember that you are trying to beat everyone in the room. This payoff scheme was constructed so that subjects could not reasonably hope to win unless they were both lucky and willing to choose high risk lotteries.

After the subjects' choices had been made, they were evaluated as before. Then the purpose of the experiment was explained and questions were answered. Course point credits and monetary payoffs for both conditions were given to subjects at the end of the session.

Results

The data for the experiment are the number of times a subject chose a particular lottery out of the total number of times that the lottery was available for choice. Since each lottery was paired three different times with each of the other five stimuli, the maximum number of times that a lottery could be chosen was 15 (5 pairs x 3 presentations) and the minimum was zero.

Table 1 gives the mean number of times each of the lotteries was chosen in the three aspiration conditions averaged over subjects. Lotteries are listed in the order in which they are preferred by typically risk averse subjects (Lopes, 1984; Schneider & Lopes, 1986). Asterisks indicate the lotteries for which choices in the low or high aspiration condition were significantly different from choices in the neutral condition.

Insert Table 1 about here

Overall, there is a strong tendency toward risk aversion, $F(5, 440) = 68.20$, $p < .001$. However, the degree of risk aversion is clearly affected by whether the choice is made under the neutral, low, or high aspiration condition, $F(10, 880) = 23.32$, $p < .001$. Taking the neutral condition as a baseline, we see a moderately strong tendency toward risk aversion. This tendency is amplified in the low aspiration condition where preferences for the least risky lotteries (RL, SS, and PK) increase and preferences for the most risky lotteries (RC, BM, and LS) decrease, although not significantly so for PK and for LS. In the high aspiration condition, however, there is a trend away from risk aversion. Although the basic order of preference is largely unchanged, preferences for the SS and PK lotteries clearly decrease relative to the neutral condition whereas preference for the LS lottery increases.

Although these shifts in strength of preference were in every case in the appropriate direction given the aspiration manipulation, we had expected more dramatic shifts, affecting even order of preference. Inspection of the raw data suggested that larger shifts had, in fact, occurred for some subjects, but not all. In order to examine the possibility that some subjects were essentially unaffected by the aspiration manipulation, correlations between preferences for each pair of conditions for each subject were

computed. As we suspected, for 41 of the 89 subjects, the pairwise inter-correlations among the three aspiration conditions were all above 0.5 indicating little effect of the manipulations. To see whether this group of subjects was obscuring another pattern of data, the preference data were separated into groups. The 41 subjects whose preferences showed inter-condition correlations all above 0.5 were considered members of the low responsive group and the remaining 48 subjects were considered members of the high responsive group.

Insert Figures 2 and 3 about here

Figures 2 and 3 illustrate the differences in patterns of preferences in each of the three conditions for low and high responsive subjects, respectively. In the low responsive group, the pattern of preferences is strongly risk averse for all three conditions, $F(5,200) = 83.92$, $p < .001$, although there is a small but reliable response to the aspiration manipulations, $F(10,400) = 3.50$, $p < .001$. In the high responsive group, however, the initial pattern of risk aversion in the neutral condition is clearly amplified by the low aspiration condition, $F(5,235) = 11.80$, $p < .001$, and essentially reversed by the high aspiration condition, $F(5,235) = 16.80$, $p < .001$. (The seemingly special status of lottery RL and the relative preference of subjects for SS versus PK will be considered in the final discussion).

Comparison of Figures 2 and 3 also suggests that the low

responsive group were more risk averse (i.e., had steeper preference functions) than the high responsive group even under the neutral condition, $F(5,435) = 8.97$, $p < .001$. We wondered whether there is a relationship between the strength of a person's tendency to avoid risky options (or seek safe options) and the degree to which his or her preferences are susceptible to changes based on task demands. In order to examine this possibility, each subject's preference scores in the neutral condition were correlated with the set of preference scores that would result if a person were perfectly risk averse in his or her choices. The magnitude of this correlation was then used as an index of each subject's tendency to choose the least risky lotteries.

Insert Table 2 about here

Table 2 shows the number of subjects whose risk aversion index was above versus below 0.5 for the low and high responsive groups. Although two-thirds of the subjects are in the high risk aversion group, it is still possible to detect a relation between risk aversion and responsiveness. Most of the high risk averse subjects (57%) are in the low responsive group whereas only a small minority (21%) of the low risk averse subjects are in that same group. A corrected chi-square test of independence confirms that this relation is significant, $X^2 = 8.59$, $p < .005$. We offer some possible explanations for this relation between risk aversion and

responsiveness in the General Discussion.

General Discussion

At the level of the group, our experiment has three main results. First, our subjects displayed strongly risk averse preferences under the neutral condition. This finding is consistent with other studies using these particular multi-outcome lotteries (Lopes, 1984, 1987; Schneider & Lopes, 1986) as well as with typical results from experiments using two-outcome lotteries involving only gains. Second, subjects' preferences became even more risk averse under the low aspiration condition. Third, subjects' risk aversion decreased under the high aspiration condition but not to the point of their switching to risk seeking or even risk neutral patterns of preference. Inspection of the single subject data showed, however, that these group results reflect an artifact of averaging over two distinctly different groups of subjects who differed in their responsiveness to the aspiration manipulation. Individual analysis showed that about half of our subjects were relatively unresponsive to the aspiration manipulation, being extremely risk averse in all three conditions. The other half, on the other hand, were quite sensitive, increasing their risk aversion under the low aspiration condition and becoming risk seeking under the high aspiration condition.

Low Responsive Subjects

We were greatly surprised at the number of subjects who responded very little to the aspiration manipulation. In retrospect, we see three possibilities for explaining their behavior. The first (and least interesting) possibility is that these subjects may have been poorly motivated. This may have caused them to respond to the stimuli superficially, choosing between lotteries solely on the basis of the number of zero tickets. Although we have no data to rule out this possibility, we doubt it ourselves for several reasons. To begin with, previous studies using larger stimulus sets (Lopes, 1984) and verbal response measures (Lopes, 1987; Schneider & Lopes, 1986) have shown that subjects' responses to these stimuli are typically very sensitive to variables other than number of zero tickets. In addition, the present game-like procedure for evaluating choices and awarding prizes seemed to be exciting and interesting to subjects.

The second possibility is that these subjects may not have understood in the high aspiration condition how high their totals would have to be in order to gain the most in a group of 30. (In actuality, the highest totals were 670, 460, and 610 in the three sessions.) Originally, we had set up the manipulation to be rather unspecific and subtle because we feared that anything more concrete (e.g., "try to average $150 per trial") would lead subjects to choose solely on the basis of how many tickets in the lottery exceeded the criterion level. Now, however, we are planning to run additional studies that will give subjects better information about the level

that they will have to achieve to win. This will be done by instruction for some subjects (i.e., setting a criterion based on totals or averages as was done in the low aspiration condition) and by feedback for other subjects (i.e., running the high aspiration condition more than once).

The final possibility reflects the fact that the low responsive subjects were, even in the neutral condition, more risk averse than the responsive subjects. (85% of the low responsive group versus 54% of the high responsive group were high in risk aversion in the neutral condition.) It may be that risk aversion is such a dominant response pattern for most of these subjects that they cannot force themselves to bypass secure options in favor of riskier and potentially more lucrative options. Winning in the high aspiration condition requires that a subject make choices that will probably yield poor outcomes. This requires an understanding of the role of chance and a willingness to put oneself in the situation where good luck can operate. In the present task, there seems to be little benefit to the subject of choosing conservatively (i.e., of playing to survive rather than playing to win). In the real world, however, criteria are usually not so discrete and what we observe as a puzzling and rather foolish non-responsiveness may turn out to be a reasonably sensible preference for guaranteeing a satisfactory outcome even if a winning outcome is, thereby, foregone.

High Responsive Subjects

In general, the data from high responsive subjects were as we supposed they would be. Of the 26 responsive subjects who scored high in risk aversion in the neutral condition, 24 stayed at the same level of risk aversion or increased their risk aversion in the low aspiration condition and 23 decreased their risk aversion or became risk seeking in the high aspiration condition. Of the 22 responsive subjects who were low in risk aversion in the neutral condition, 13 increased their risk aversion in the low aspiration condition and 16 stayed at the same level or became increasingly risk seeking in the high aspiration condition.

One question of interest concerning these subjects involves the degree to which their extrinsically induced preference patterns are similar to "real" (i.e., dispositional or uninduced) patterns of preference. To examine this question, we compared the present preference data for the low and high aspiration conditions with preference data generated by subjects in a previous experiment (Schneider & Lopes, 1986) who had been pre-selected for extreme levels of risk aversion and risk seeking. Figures 4 and 5 show the data from our low and high aspiration conditions, respectively, plotted against preferences computed on the same six stimuli for risk averse subjects (Figure 4) and risk seeking subjects (Figure 5) from the earlier study. As is evident, the data patterns are virtually identical. Despite the fact that our sample of responsive subjects contained both dispositionally risk averse and dispositionally risk

seeking subjects (as judged by their preferences in the neutral condition), the preference patterns induced by the low aspiration manipulation and the high aspiration manipulation are essentially identical to their naturally occurring counterparts in risk averse and risk seeking individuals, respectively.

Insert Figures 4 and 5 about here

Although our primary interest in this study concerned overall patterns of risk aversion and risk seeking, two final points are worth noting about individual stimuli. One is the finding, evident in both the present data and the data from Schneider & Lopes (1986), that lottery RL seems to enjoy a privileged status, being well-liked by both risk-averse and risk-seeking subjects in the previous study and being well-liked under both low and high aspiration conditions in the present study.

In some ways, this result is surprising. In the low aspiration condition, one might suppose that RL would be less preferred than either SS or PK since it gives a 31% chance of failing to meet the aspiration level (i.e., $80) versus only 22% and 26%, respectively, for the other two lotteries. Likewise, for the high aspiration condition, the chances of scoring at or above $100 are, in fact, greater for SS and PK than for RL. However, these considerations may be of only minor concern in the present task because the criteria for "winning" depend on the average (or total) outcome for three draws.

Thus, the RA lottery may seem more desirable than SS and PK in the low aspiration condition because it almost guarantees that the aspiration level will be achieved while still offering the possibility of more.

In the high aspiration condition, on the other hand, choice of lottery SS effectively sets a $130 ceiling on possible outcome. Subjects who suppose that very high outcomes are necessary to "win" should, therefore, reject SS. In the choice between RL and PK, however, the situation is not so clear since PK is slightly more likely to yield an outcome greater than $100. Nevertheless, the worst-case guarantee of $70 may well seem worth the small cost in median outcome.

The final comparison concerns the BM and LS lotteries. Note that for the low aspiration condition, these lotteries are approximately equally disliked. For the high aspiration condition, on the other hand, LS is clearly preferable to BM. This pattern makes sense in the context of the security/potential factor of Lopes' (1986) two-factor theory. As can be seen by inspection of the lowest outcomes in the two lotteries, there is very little difference between BM and LS overall. Thus, if subjects are paying primary attention to worst-case outcomes in the low aspiration condition (i.e., assessing security), we should expect these lotteries to "look" very similar. If, however, subjects in the high aspiration condition are paying primary attention to best-case outcomes (i.e., assessing potential), these lotteries should look very different

since one of them offers a reasonably good chance of moderately high outcomes whereas the other one offers a small chance of extremely high outcomes. In terms of potential motivation, LS is clearly preferable to BM.

Overall, our data suggest that differences in aspiration level, as well as differences in security/potential motivation, can affect risky choice. Graceful accounts of these effects are not to be found in utility-type theories wherein situational and motivational factors are generally ignored. It would seem that considering these influential environmental and human constraints can only lead to a richer understanding of the process of risky choice.

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Figure Captions

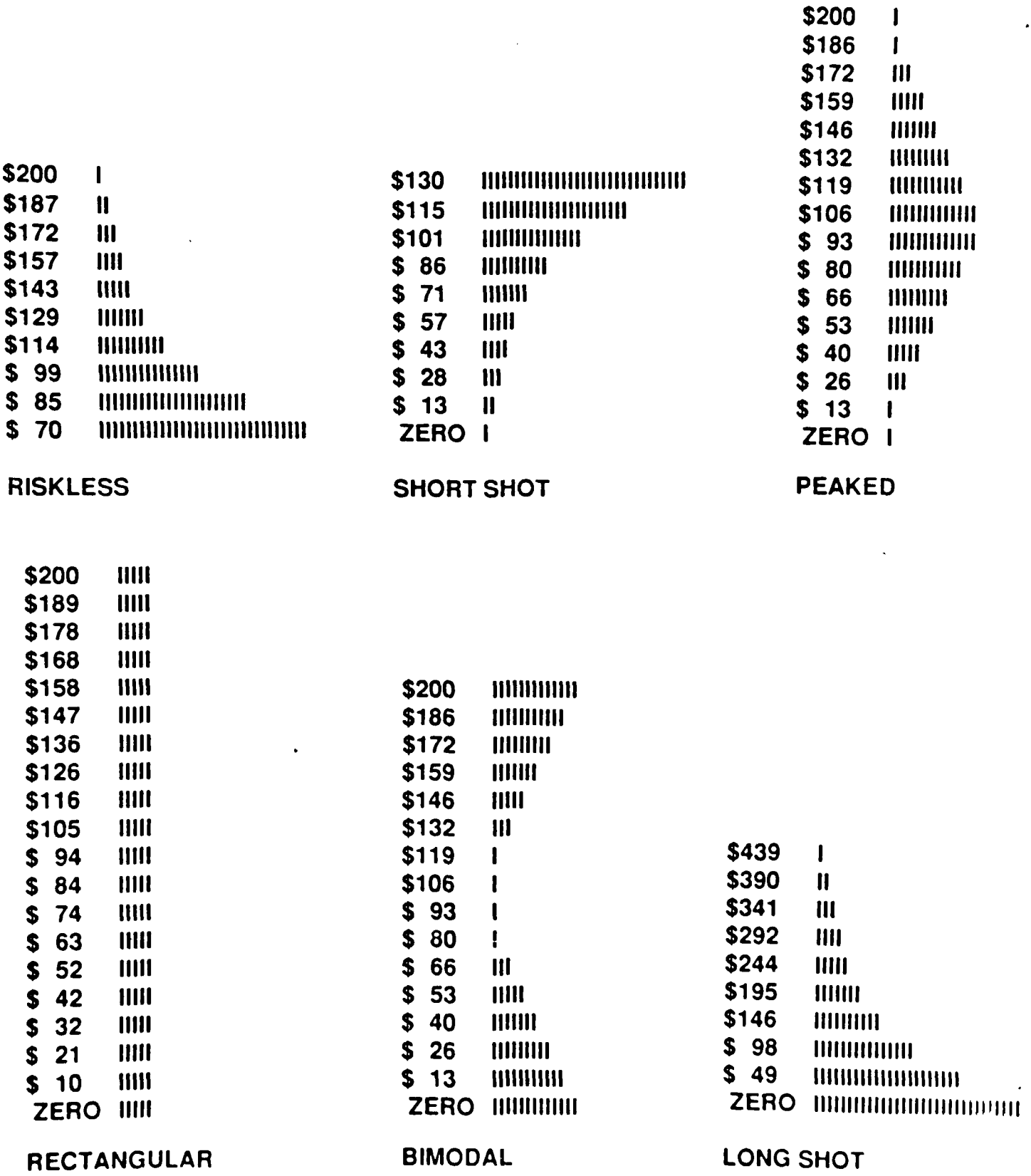
Figure 1. Stimulus set of six multi-outcome lotteries.

Figure 2. Mean preference scores for low responsive subjects.

Figure 3. Mean preference scores for high responsive subjects.

Figure 4. A comparison of mean preference scores for high responsive subjects in the low aspiration condition and for subjects who were pre-selected for extremely high levels of risk aversion in the Schneider and Lopes (1986) study.

Figure 5. A comparison of mean preference scores for high responsive subjects in the high aspiration condition and for subjects who were pre-selected for extremely high levels of risk seeking in the Schneider and Lopes (1986) study.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$157
$143
$129
$114
$ 99
$ 85
$ 70
RISKLESS
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$115
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$ 86
$ 71
$ 57
$ 43
$ 28
$ 13
ZERO
SHORT SHOT
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$186
$172
$159
$146
$132
$119
$106
$ 93
$ 80
$ 66
$ 53
$ 40
$ 26
$ 13
ZERO
PEAKED
$200
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$178
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$158
$147
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$ 26
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$244
$195
$146
$ 98
$ 49
ZERO
LONG SHOT

Figure 1

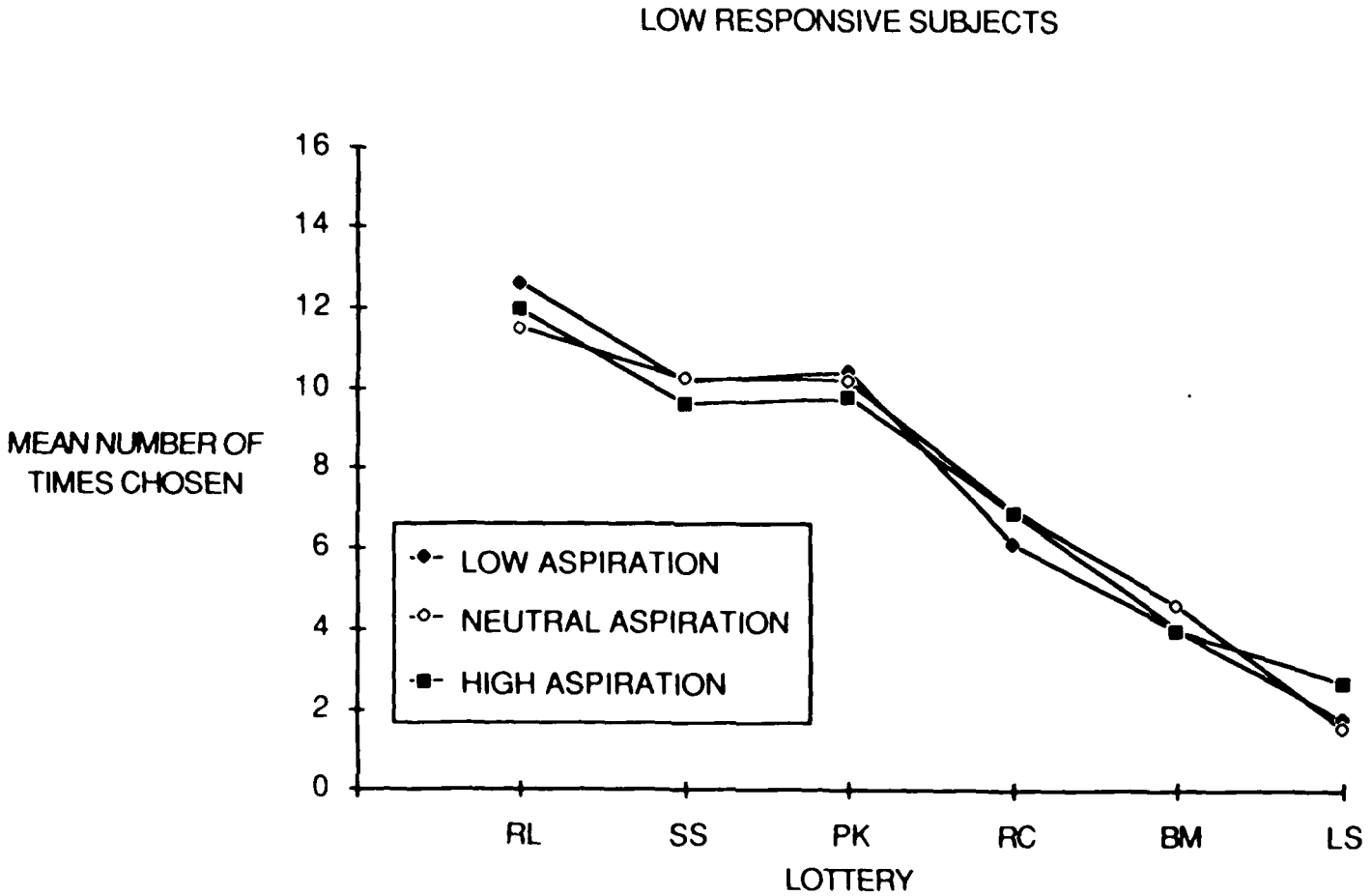
LOW RESPONSIVE SUBJECTS
MEAN NUMBER OF TIMES CHOSEN
16
14
12
10
8
6
4
2
0
LOW ASPIRATION
NEUTRAL ASPIRATION
HIGH ASPIRATION
RL
SS
PK
RC
BM
LS
LOTTERY

Figure 2

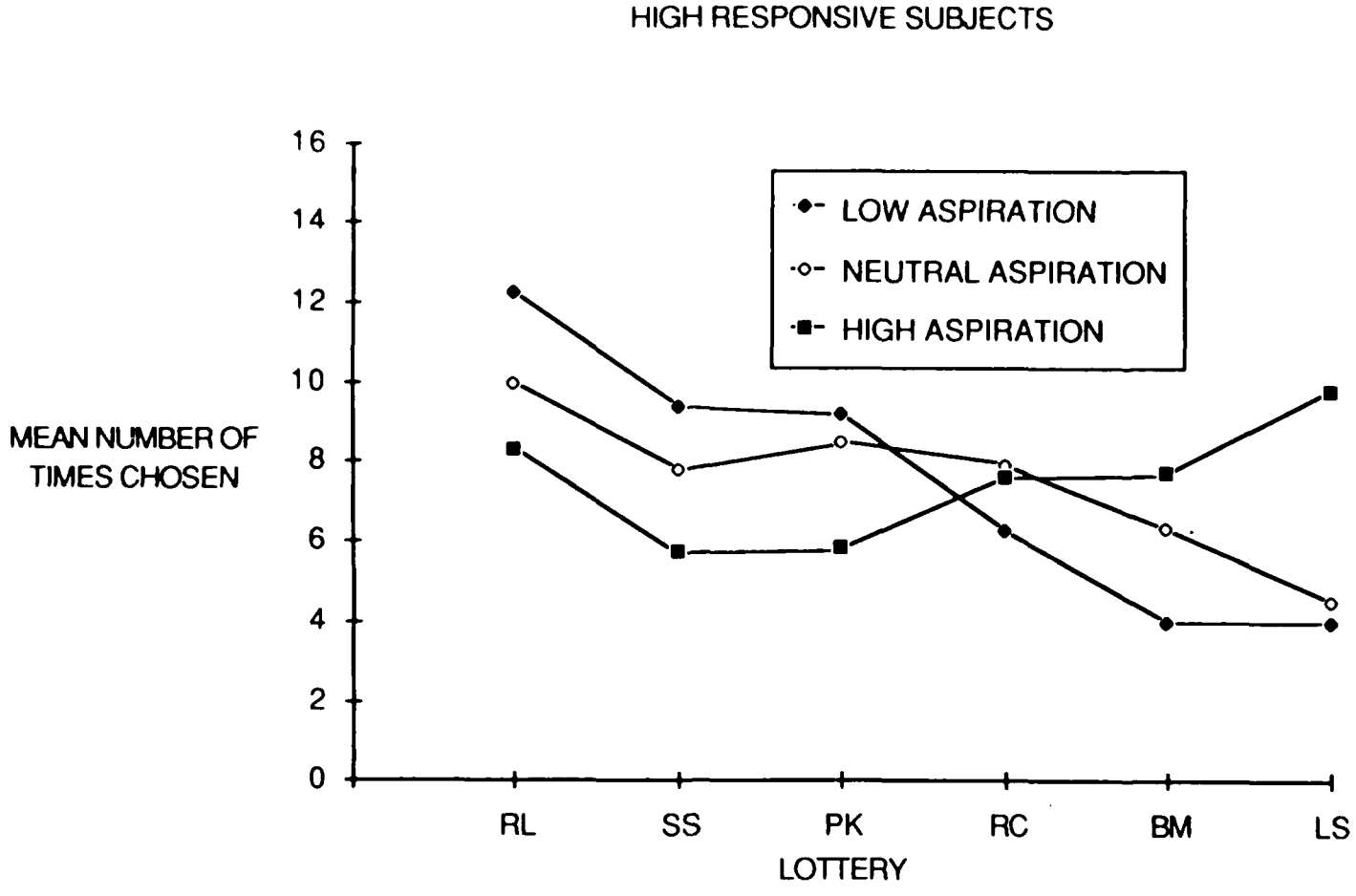
HIGH RESPONSIVE SUBJECTS
LOW ASPIRATION
NEUTRAL ASPIRATION
HIGH ASPIRATION
MEAN NUMBER OF TIMES CHOSEN
16
14
12
10
8
6
4
2
0
RL
SS
PK
RC
BM
LS
LOTTERY

Figure 3

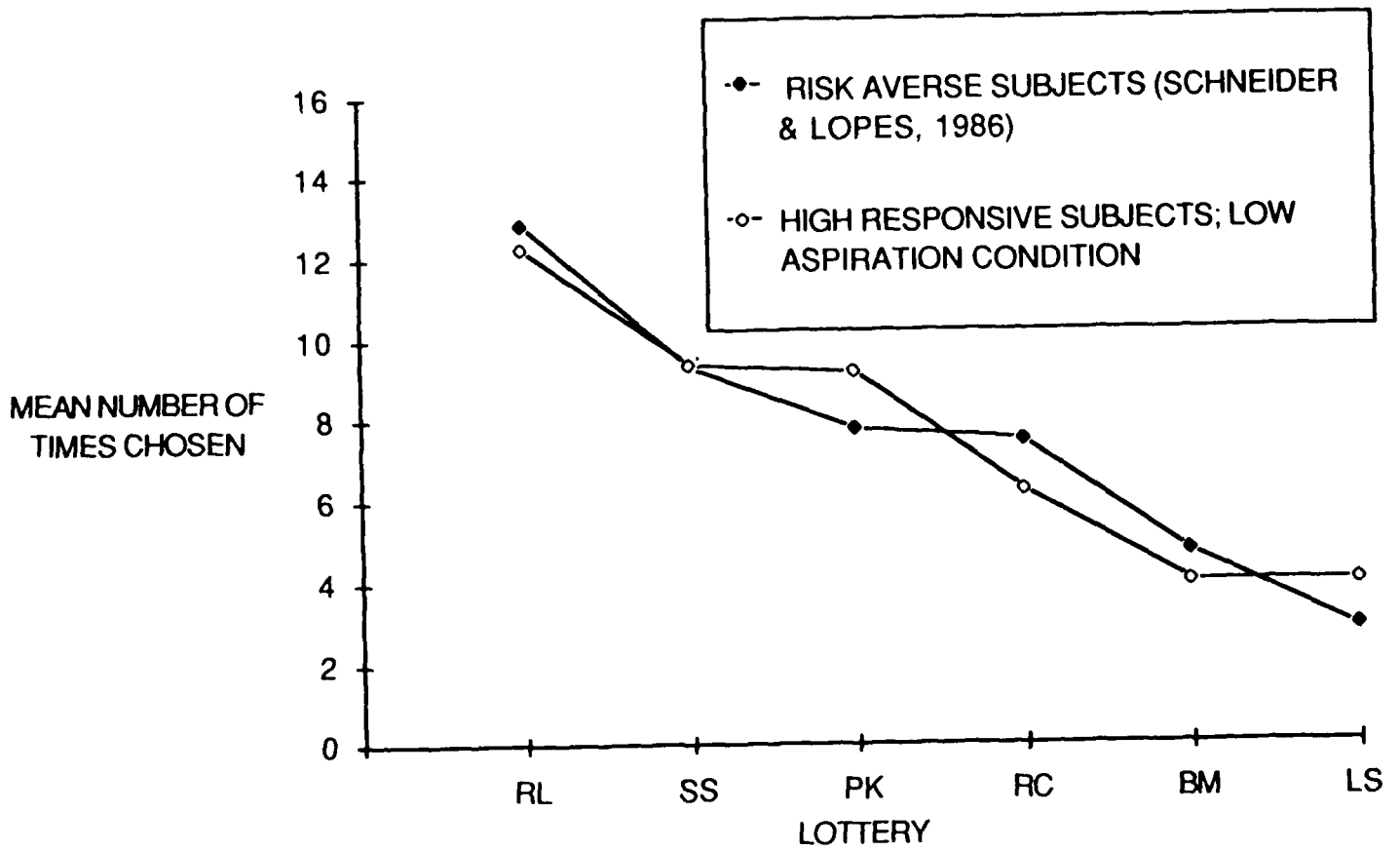
RISK AVERSE SUBJECTS (SCHNEIDER & LOPES, 1986)
HIGH RESPONSIVE SUBJECTS; LOW ASPIRATION CONDITION
MEAN NUMBER OF TIMES CHOSEN
16
14
12
10
8
6
4
2
0
RL
SS
PK
RC
BM
LS
LOTTERY

Figure 4

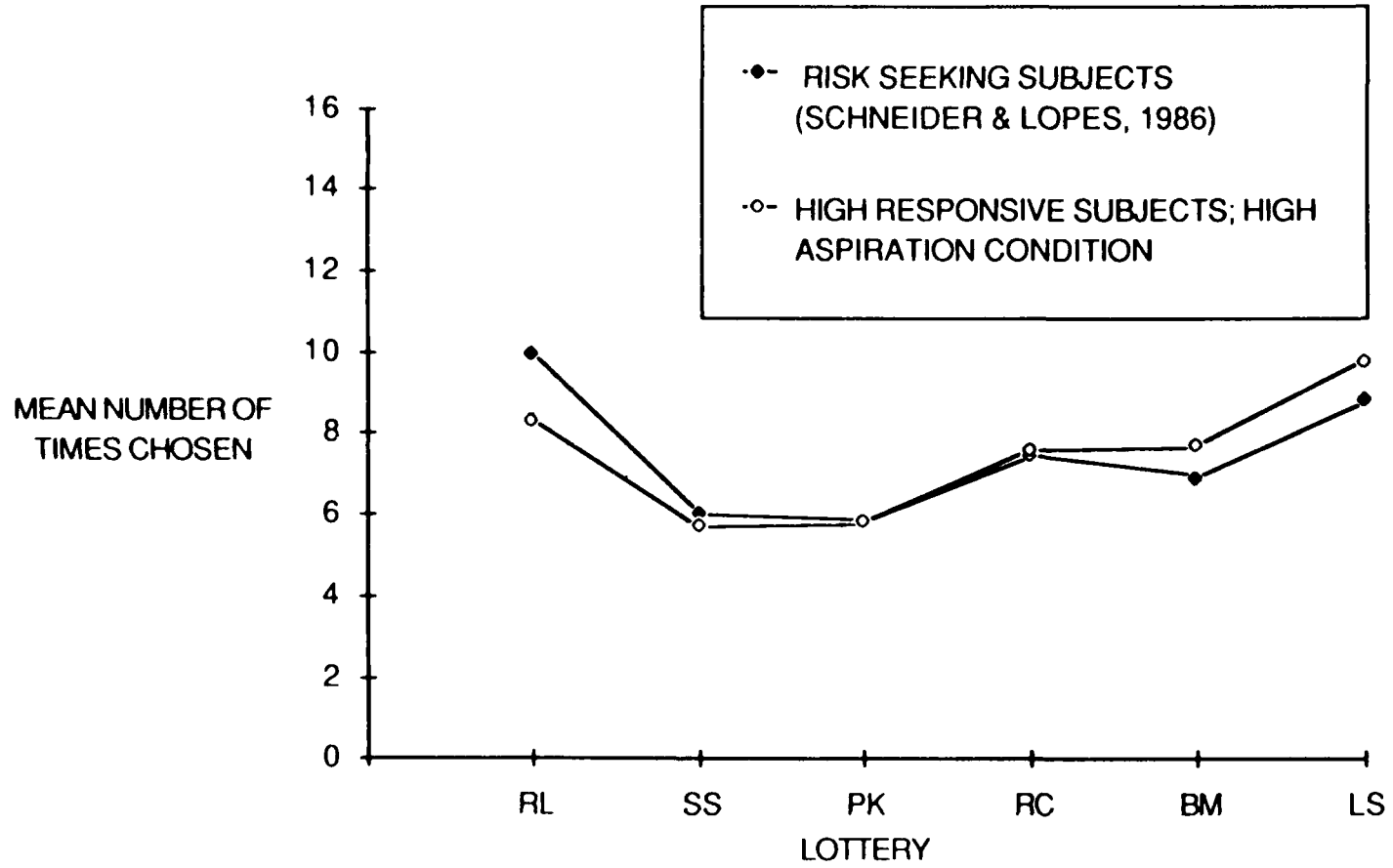
RISK SEEKING SUBJECTS
(SCHNEIDER & LOPES, 1986)
HIGH RESPONSIVE SUBJECTS; HIGH
ASPIRATION CONDITION
MEAN NUMBER OF
TIMES CHOSEN
16
14
12
10
8
6
4
2
0
RL
SS
PK
RC
BM
LS
LOTTERY

Figure 5

Table 1

Mean Preference Scores for Lotteries Across Aspiration Conditions

Lottery	Aspiration Level		
	NEUTRAL	LOW	HIGH
RL	10.69	12.40**	10.01
SS	8.91	9.73*	7.52**
PK	9.27	9.73	7.64**
RC	7.48	6.19**	7.28
BM	5.51	3.98**	6.01
LS	3.15	2.97	6.54**

Note. *Maximum score* = 15, *minimum* = 0. * = preference scores are significantly different from the Neutral condition by repeated measures contrast, $p < .05$. ** = preference scores are significantly different from the Neutral condition by repeated measures contrast, $p < .01$.

Table 2

The Number of Subjects in the Risk Aversion and Responsiveness Groups

		Responsiveness		
		Low	High	Total
Risk	Low	6	22	28
Aversion	High	35	26	61
	Total	41	48	89

Note. Low (high) risk aversion refers to whether the correlation between a subject's preference data in the neutral condition and idealized risk preference data is $<$ ($\geq$) 0.5. Low (high) responsiveness refers to whether (or not) all of a subject's inter-condition correlations among lottery preferences are $\geq$ 0.5.

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