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Payoffs, Probabilities, and Preferences: Relative Risk Aversion Across Treatments of Multiple Payoff Structures.

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Relative Risk Aversion Across Treatments of Multiple Payoff Structures

A thesis submitted in partial fulfillment of the requirement for the degree of Bachelor of Arts in the Department of Economics from the College of William and Mary

by

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Abstract

We conducted a study to examine whether cost-saving practices in human behavior experiments elicit realistic decisions. Subjects participated in three lottery choice treatments modeled after Holt and Laury's 2002 design. Each treatment had varying financial incentives, and a coefficient of relative risk aversion was assigned for the decisions made in each treatment. The experiment was paired with a follow-up survey that included demographic questions and questions pertaining to a subject's engagement in risky behaviors. The study found statistically significant increases in risk-aversion with increases in the scale of payoffs. None of the risky behaviors on the survey predicted risk-loving behavior in the experiment. The study did find, however, that self-financing college predicted risk-averse behavior in two of the three treatments.

1. Introduction

In academia there is much discussion over the importance of financial incentives in human decision making experiments. Generally, economists stress the importance of providing salient financial incentives whereas psychologists argue that individuals act consistently across incentivized and hypothetical situations. This discussion has important implications for policy-related research. If individuals do not act consistently across hypothetical and financially incentivized setups, we cannot extrapolate findings from studies with hypothetical payoffs to the "real world" situations they are intended to study. Even in studies with real monetary payoffs, there is evidence that the scale of the incentives affects behavior. [1] Therefore, it is possible that paying subjects too little will not induce behavior that is comparable to actual high stakes decisions.

Experimental researchers are often budget constrained. To address this problem, economists often randomly select a small portion of participants to receive relatively high payoffs, award scaled-down payoffs to all subjects, or elicit risk behavior using entirely hypothetical scenarios. We propose to study whether these cost saving practices induce behavior that is comparable to behavior in experiments with high stakes. We study this question in the context of a risk tolerance experiment. In this environment, a person's payoff depends only on their own choices and on chance. Thus, we eliminate the confounding effect of interactions between subjects. We will use the classic Holt and Laury (hereafter HL, 2002) design: subjects have to make ten decisions where they can choose a relatively safe gamble or a risky gamble, each with a low payoff and a high payoff. With each decision, the high payoff becomes more probable, leading subjects to switch from the safe to the risky choice as the experiment

[1] See, for example, Camerer and Hogarth (1999).

progresses. A subject's exact switching point reveals his or her degree of risk tolerance. We induce risk behavior under three treatments of differing payoffs and probabilities. By having each subject make decisions under three unique payoff schemes, we can observe whether risk tolerance is sensitive to the method and scale of payoffs.

Our data shows a statistically significant increase in risk averse behavior with an increase in the scale of payoffs. This result provides strong evidence that a researcher's choice of financial incentives in human decision-making experiments is imperative to the validity of the model. Controlling for known demographic predictors of risky behavior, we found, contrary to existing research, that traits such as race and gender had no measurable effect on the number of safe decisions made in our experiment. Likewise, self-reported risky behaviors on a follow-up survey failed to predict risky behavior in any of the three treatments. This dissimilitude between observed and self-reported behavior in our subjects strengthens the argument that hypothetical treatments do not elicit realistic behavior. The strongest predictor of risk-averse behavior in our model was whether a subject reported that they self-financed college. This finding suggests that variables related to a subject's income should be controlled for in financially incentivized experiments.

2. Literature Review

There is a wide body of academic research on the use of lottery choice experiments to measure risk behavior. These experiments feature a wide array of payoff schemes. However, very few use a within-subjects design that has each subject make decisions under multiple payoff structures. This allows us to examine varying risk behavior in an individual subject. Furthermore, no study employs the three payoff schemes used in our design. Anderson and

Mellor (2008) tested the stability of risk preferences across hypothetical and financially incentivized treatments. Their model compared the responses of subjects on a survey to risk-preferences exhibited in an experiment with monetary awards. The study found that, for the majority of participants, risk preferences were not stable between treatments. This implies that experiments in which subjects are asked to respond to hypothetical scenarios or self-report risky behavior do not generate results that correspond to how a subject actually behaves.

Selten, Sadrieh, and Abbink (1999) conducted an experiment that compared the effects of monetary payments to binary lottery ticket payments on risk-behavior. Subjects paid in binary lottery tickets exhibited greater tendency towards either risk-seeking or risk-averse behavior, whereas those paid in cash behaved in a more risk-neutral fashion. In this experiment, therefore, subjects treated the guaranteed payoffs with a greater degree of seriousness than the probabilistic setting. This experiment shows that probabilistic incentives can cause significant deviations in risk-behavior. These deviations underscore the validity of my experiment's comparison of probabilistic and guaranteed payoffs in determining the expected value of a subject's payoff in any given treatment.

Holt and Laury (2002) conducted a study in which a menu of 10 paired lottery choices was given to determine a crossover point designed to measure a subject's degree of risk aversion. Subjects had to choose between a "safe" Option A and a "risky" Option B. Option A's payoffs were $2.00 or $1.60 whereas Option B's payoffs were $3.85 or $0.10. Both the decision for which a subject was paid and the payment made to that individual subject was determined by the throw of a ten-sided die. To determine the effect of the magnitude of the payoffs, Holt and Laury split the experiment into 5 treatments, with the original payoffs scaled up by a factor of 20, 50 and 90. Treatment 1 consisted of hypothetical payoffs scaled up by a factor of 20, treatment 2 consisted of real payoffs scaled up by a factor of 20, and treatments 3 through 5 included both real and hypothetical payments scaled up by factors of 20, 50 and 90 respectively. The results showed significant increases in risk aversion with increases in payoffs, going against existing theory of constant relative risk aversion. However, this increase was not observed when the hypothetical payoffs increased in magnitude. Holt and Laury's 2002 experiment lays the foundation from which we built our model.

Several other papers have examined payoff effects using the HL (2002) design. The two most closely related to our work are a 2008 study by Susan Laury and a 2010 study by John Dickhaut et al. The former experiment recruited 115 students from Georgia State University to participate in one of three treatments utilizing the HL (2002) design. The treatments included ten Holt-Laury gambles with either a "safe" choice, with potential earnings of $2.00 or $1.60, or a "risky" choice, with potential earnings of $3.85 or $0.10. The key variation across treatments concerned the scale of payoffs. In the first treatment, a ten-sided die was thrown to determine one randomly selected decision for which 55 subjects would be paid the exact amount described. The second treatment included an identical procedure with 30 different subjects, but with the payoffs scaled upwards by a factor of 10. The third treatment used the payoffs for the first treatment, but paid 30 subjects for all ten decisions made. The results indicated that, conditional on paying subjects low amounts, risk tolerance was not significantly different between a group that was paid for only one decision and a group that was paid for all ten decisions. However, a significant increase in risk aversion was observed when payoffs were scaled up by a factor of 10. The positive correlation between risk aversion and both the magnitude and probability of payoffs is consistent with the findings of Selten et al. and Holt and Laury.

Dickhaut et al. (2010) also used the HL (2002) setup to study payoff effects. Subjects participated in one of five treatments in which they were presented with the original HL (2002) payoffs. Treatments 1 through 4 corresponded to the raw, low payoffs scaled up by factors of 20, 50, and 90, respectively, as they occurred in the HL (2002) design. Treatment 5 multiplied the low payoffs by a factor of 180. For each treatment, in the first stage of the experiment subjects earned points rather than money for every decision. In the second stage, the points translated into chances of earning a $2.50 prize for each of the ten decisions. The purpose was to elicit high-stakes behavior in a low stakes environment. Procedures were identical across treatments, a key exception being the probability of winning the prize. The researchers compared their results from the points-based payment scheme to those of HL (2002) with real and hypothetical payoffs and found that subjects paid under the points-based system behaved similarly to the HL subjects with real payoffs.

The two studies mentioned, though sharing many important features of our design, differ in one significant way. That is, both studies compare payoff effects across *different* subject pools. Thus, no single subject makes decisions under more than one payoff scheme. This is problematic because we know from other research that risk tolerance varies across gender, age and personality type. By using a different group of subjects for each payoff treatment, such studies do not control for these known determinants of risk tolerance.

3. Model

Our experiment consists of three lottery choice menus modeled after the HL (2002) design. For each treatment, the point at which a subject crosses over from the “safe” Option A to the “risky” Option B is used to assign a coefficient, r (between -0.95 and 1.37), known as the midpoint of the range of the coefficient of relative risk aversion (hereafter known as the mid-CRRA) to a subject. A mid-CRRA between -0.95 and -0.15 defines a subject as risk loving, a mid-CRRA between -0.15 and 0.15 defines a subject as risk neutral, and a mid-CRRA between 0.15 and 1.37 defines a subject as risk averse. Following the HL (2002) design, we assume constant relative risk aversion. Constant relative risk aversion holds that a subject's utility as a function of a monetary payoff decreases with a higher mid-CRRA, or $u(x) = x^{1-r}$ for $x > 0$, where *u* is utility, *x* is the payoff, and *r* is the mid-CRRA. This implies that the scale of the payoffs do not affect risk behavior, as *r* is independent of *x*.

Our design tests the theory of constant relative risk aversion by having each of 96 subjects participate in 3 treatments of varying payoffs and probabilities based on the HL (2002) model. The experiments were conducted in 12 sessions with 8 subjects each. The first treatment (which we refer to as HIGH ALL) includes a menu of high payoff lottery choices where Option A includes payoffs of $32.00 or $25.60 and Option B includes payoffs of $61.60 or $1.60, and all subjects are paid for 1 decision. Tables 1-3 detail the payoffs, probabilities, and the difference in expected payoff between option A and option B for any decision in each treatment.

Table 1. Lottery choice menu for the HIGH ALL treatment.

Decision	Option A	Option B	E(A)-E(B)
1	$32.00 if the die is 1 $25.60 if the die is 2-10	$61.60 if the die is 1 $1.60 if the die is 2-10	18.64
2	$32.00 if the die is 1-2 $25.60 if the die is 3-10	$61.60 if the die is 1-2 $1.60 if the die is 3-10	13.28
3	$32.00 if the die is 1-3 $25.60 if the die is 4-10	$61.60 if the die is 1-3 $1.60 if the die is 4-10	7.92
4	$32.00 if the die is 1-4 $25.60 if the die is 5-10	$61.60 if the die is 1-4 $1.60 if the die is 5-10	2.56
5	$32.00 if the die is 1-5 $25.60 if the die is 6-10	$61.60 if the die is 1-5 $1.60 if the die is 6-10	-2.8
6	$32.00 if the die is 1-6 $25.60 if the die is 7-10	$61.60 if the die is 1-6 $1.60 if the die is 7-10	-8.16
7	$32.00 if the die is 1-7 $25.60 if the die is 8-10	$61.60 if the die is 1-7 $1.60 if the die is 8-10	-13.52
8	$32.00 if the die is 1-8 $25.60 if the die is 9-10	$61.60 if the die is 1-8 $1.60 if the die is 9-10	-18.88
9	$32.00 if the die is 1-9 $25.60 if the die is 10	$61.60 if the die is 1-9 $1.60 if the die is 10	-24.24
10	$32.00 if the die is 1-10	$61.60 if the die is 1-10	-5.6

The second treatment (which we refer to as HIGH ONE) includes a menu of high payoff lottery choices with payoffs identical to the HIGH ALL treatment, but only 1 of the 8 subjects, determined at random, is paid for 1 of the 10 decisions.

Table 2. Lottery choice menu for the HIGH ONE treatment.

Decision	Option A	Option B	E(A)-E(B)
1	$32.00 if the die is 1 $25.60 if the die is 2-10	$61.60 if the die is 1 $1.60 if the die is 2-10	2.33
2	$32.00 if the die is 1-2 $25.60 if the die is 3-10	$61.60 if the die is 1-2 $1.60 if the die is 3-10	1.66
3	$32.00 if the die is 1-3 $25.60 if the die is 4-10	$61.60 if the die is 1-3 $1.60 if the die is 4-10	0.99
4	$32.00 if the die is 1-4 $25.60 if the die is 5-10	$61.60 if the die is 1-4 $1.60 if the die is 5-10	0.32
5	$32.00 if the die is 1-5 $25.60 if the die is 6-10	$61.60 if the die is 1-5 $1.60 if the die is 6-10	-0.35
6	$32.00 if the die is 1-6 $25.60 if the die is 7-10	$61.60 if the die is 1-6 $1.60 if the die is 7-10	-1.02
7	$32.00 if the die is 1-7 $25.60 if the die is 8-10	$61.60 if the die is 1-7 $1.60 if the die is 8-10	-1.69
8	$32.00 if the die is 1-8 $25.60 if the die is 9-10	$61.60 if the die is 1-8 $1.60 if the die is 9-10	-2.36
9	$32.00 if the die is 1-9 $25.60 if the die is 10	$61.60 if the die is 1-9 $1.60 if the die is 10	-3.03
10	$32.00 if the die is 1-10	$61.60 if the die is 1-10	-0.7

The third treatment (which we refer to as LOW ALL) includes a menu of low payoff lottery choices where Option A includes payoffs of $4.00 or $3.20 and Option B includes payoffs of $7.70 or $0.20.

Table 3. Lottery choice menu for the LOW ALL treatment.

Decision	Option A	Option B	E(A)-E(B)
1	$4.00 if the die is 1 $3.20 if the die is 2-10	$7.70 if the die is 1 $0.20 if the die is 2-10	2.33
2	$4.00 if the die is 1-2 $3.20 if the die is 3-10	$7.70 if the die is 1-2 $0.20 if the die is 3-10	1.66
3	$4.00 if the die is 1-3 $3.20 if the die is 4-10	$7.70 if the die is 1-3 $0.20 if the die is 4-10	0.99
4	$4.00 if the die is 1-4 $3.20 if the die is 5-10	$7.70 if the die is 1-4 $0.20 if the die is 5-10	0.32
5	$4.00 if the die is 1-5 $3.20 if the die is 6-10	$7.70 if the die is 1-5 $0.20 if the die is 6-10	-0.35
6	$4.00 if the die is 1-6 $3.20 if the die is 7-10	$7.70 if the die is 1-6 $0.20 if the die is 7-10	-1.02
7	$4.00 if the die is 1-7 $3.20 if the die is 8-10	$7.70 if the die is 1-7 $0.20 if the die is 8-10	-1.69
8	$4.00 if the die is 1-8 $3.20 if the die is 9-10	$7.70 if the die is 1-8 $0.20 if the die is 9-10	-2.36
9	$4.00 if the die is 1-9 $3.20 if the die is 10	$7.70 if the die is 1-9 $0.20 if the die is 10	-3.03
10	$4.00 if the die is 1-10	$7.70 if the die is 1-10	-0.7

The payoffs and probabilities are structured such that the HIGH ONE and LOW ALL treatments generate the same expected difference in payoff between the two options for any given decision, whereas the HIGH ALL treatment generates a far higher expected payoff for every decision. Therefore, any variance in risk behavior between the HIGH ONE and LOW ALL treatments violates the assumption of constant relative risk aversion, providing a foundation for further tests of existing economic theory.

4. Experimental Design

Subjects for our experiment consisted of 96 undergraduate students enrolled at the College of William and Mary, the majority recruited from ECON 101 and ECON 102 classes in order to avoid filling our experiment with too many economics majors. The study included 12 sessions of experiments with 8 subjects each. Because previous research indicates that risk-preference varies by gender, each group of 8 subjects contained 4 male and 4 female students. Including an equal number of subjects across all treatments corrects for any influence a different number of subjects could have on any individual session, increasing the reliability of statistical comparisons across treatments. Sessions contained 8 subjects so that the expected value of the payoff in the HIGH ONE treatment could be equal to the expected value of the payoff in the LOW ALL treatment while containing the same payoff amounts as the HIGH ALL treatment. This allows us to assume with greater confidence that any variation in risk behavior across the HIGH ONE and LOW ALL treatments results from the magnitude of the payoff, or the degree of seriousness with which a subject takes a treatment with a lesser probability of payment. All subjects were paid $5 for showing up before participating in the series of 3 treatments. To ensure that all sessions were filled, 6 males and 6 females were recruited for each session, and the extras were sent home with the $5 show-up fee. Subjects then took seats at individual terminals, separated by dividers, and were read the instructions (for a full text of the instructions, see Appendix A).

The subjects were informed that they were about to participate in 3 treatments in which they would make a series of 10 decisions between Option A and Option B (see tables 1-3), with payoffs to be determined by the throw of a 10-sided die. A valid concern that arises when testing the behavior of subjects across multiple treatments is the effect that an earlier treatment might have on a subject's decisions in a later treatment. To limit any order effects that could occur, the instructions were not specific to any of the 3 treatments, and the decisions sheets were all placed on the subjects' desks, face-up, to be filled out in any order the subjects wished. To account for the possibility that the order in which the sheets were placed on the desk could influence behavior, we divided the 12 sessions into 6 groups representing every possible order in which the three treatments could be presented. For example, order 1 included the HIGH ALL treatment on the left, the HIGH ONE treatment in the middle, and the LOW ALL treatment on the right, and order 2 included the HIGH ALL treatment on the left, the LOW ALL treatment in the middle, and the HIGH ONE treatment on the right, and so-on (see Appendix B). It is important to note that multiple subjects were observed switching back and forth between all three sheets, indicating that the order in which the sheets were presented had little effect on the order in which they were filled out.[2] Subjects were provided with a calculator and a pen when making decisions to allow them to compute expected payoffs should they desire.

In the instructions, subjects were informed that, at the conclusion of the experiment, they would be asked to log onto a laptop and complete a survey. The survey included a series of demographic and behavioral questions pertinent to risk-behavior (for full text, see Appendix C). Among these were age, sex, and questions such as how the subject paid for college, seatbelt use, speeding habits, and gambling habits. The purpose for including these questions is to identify which of these factors acts as an explanatory variable for risk-behavior in the experiment. Because many of the variables on the survey are known to be correlated with risky behavior, these questions also allow us to test for consistency between self-reported behavior on the survey and real-word financially-induced behavior in the experiment.

Upon completion of the survey, we went to each subject and threw a 10-sided die to determine, first, the decision for which they would be paid and, then, the payoff for that decision for the HIGH ALL and LOW ALL treatments (see Appendix B). Finally, another 10-sided die

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[2] We also ran econometric tests for order and did not find a consistent effect (see tables 6 and 7).

was thrown to determine which of the 8 subjects would be paid for the HIGH ONE treatment. If a 9 or a 10 was rolled, the die was thrown until a number between 1 and 8 resulted. Once a subject was chosen, the die throws were repeated to determine the decision and payoff for the HIGH ONE treatment. No die were thrown until all decisions had been filled in by all subjects. This is vital to conclusively eliminate any influence that one subject's payoff could have on another's decision.

5. Results

Of the 96 subjects that participated in the experiment, all but 30 exhibited risk averse behavior in all 3 treatments. However, even among the 66 subjects that displayed risk averse behavior, we observed several variations in the number of safe choices made by individual subjects across treatments. The largest percentage of subjects made either 6 or 7 safe choices in the HIGH ALL (49%), HIGH ONE (47%) and LOW ALL (50%) treatments. All subjects filled out answers for all 10 decisions and only 10% of subjects switched back to a safe option after choosing one or more risky options. One observation was eliminated in the HIGH ONE treatment because a subject filled out the decision sheet such that he switched from risk loving to risk averse behavior as the probabilities switched to favor the riskier option. Because he chose option A for decision 10, where the probability of the high payout was 100%, it was impossible to calculate a mid-CRRA for the subject in this treatment. This behavior, however, is noteworthy, as the subject's rational decision making in the HIGH ONE and LOW ALL treatments indicate that this event was not due to any misunderstanding of the instructions. It is likely that, due to the 7 out of 8 probability of receiving no payoff, the subject treated the HIGH

ONE treatment as hypothetical, giving weight to the argument that probabilistic financial incentives do not always elicit realistic behavior.

Subjects displayed the highest degree of risk aversion in the HIGH ALL treatment, with a mean mid-CRRA of 0.645, and 86 subjects exhibiting risk averse behavior. This result is consistent with existing literature in that higher payoffs seem to induce risk averse behavior. In general, the HIGH ONE and LOW ALL treatments saw a greater portion of the subjects displaying risk neutral and risk loving behavior. The mean of the mid-CRRA for the HIGH ONE treatment was 0.519 and the mean for the LOW ALL treatment was 0.467. Table 4 shows that the proportion of subjects making safe choices, on average, decreases from the HIGH ALL treatment to the LOW ALL treatment. It also shows a noticeable variation in the number of safe choices made across the HIGH ONE and LOW ALL treatments just as it does between the HIGH ALL and HIGH ONE treatments and the HIGH ALL and LOW ALL treatments. This is noteworthy because the difference in expected payoff between option A and option B is equal across the HIGH ONE and LOW ALL treatments. Theoretically, then, a subject should make an equal number of safe decisions across those two treatments.

Table 4. Number of safe choices made by subjects across treatments.

Safe Choices	Proportion of Subjects (HIGH ALL)	Proportion of Subjects (HIGH ONE)	Proportion of Subjects (LOW ALL)	Range of Relative Risk Aversion
0-1	0	0	0	r < -0.95
2	0.010	0.010	0.021	-0.95 < r < -0.49
3	0.021	0.042	0.063	-0.49 < r < -0.15
4	0.083	0.167	0.135	-0.15 < r < 0.15
5	0.177	0.177	0.188	0.15 < r < 0.41
6	0.240	0.229	0.313	0.41 < r < 0.68
7	0.250	0.240	0.188	0.68 < r < 0.97
8	0.125	0.115	0.042	0.97 < r < 1.37
9-10	0.094	0.021	0.052	1.37 < r

This result, along with those of previous studies, raises concerns as to whether it is valid to adhere to the assumption of constant relative risk aversion in experimental settings, and we must test whether the magnitude of the payoff is responsible for this variation in risk behavior.

To test for the significance of the variation across treatments, we performed a 2-sided Wilcoxon test on the mid-CRRAs between each combination of 2 treatments. The 2-sided Wilcoxon test is a difference-of-means test that postulates a null-hypothesis that variable 1 (the mean mid-CRRA for an individual treatment) is equal to variable 2 (the mean mid-CRRA for the other treatment). Table 5 details the results of this test. A z-statistic accompanied by a p-value that is less than 0.100 indicates that we can reject this hypothesis and accept, with over 90% confidence, the alternative hypothesis that there is a significant variation in the mid-CRRA across treatments.

Table 5. Two-sided Wilcoxon tests comparing mid-CRRA across treatments.

	Z-stat (prob>|z|)
HIGH ALL and HIGH ONE	3.400***
	(0.000)
HIGH ONE and LOW ALL	1.695*
	(0.090)
HIGH ALL and LOW ALL	4.457***
	(0.000)

Notes: Statistical significance indicated by *0.10, **0.05, and ***0.01 or better.

The results in table 5 show that there is significant variation (at the 1% level) between the HIGH ALL and each of the other 2 treatments. Statistically significant variation (at the 10% level) was also observed between the HIGH ONE and LOW ALL treatments. We expect to reject the null hypothesis when testing the HIGH ALL treatment against the other 2 treatments due to greater difference in the expected payoff of option A versus option B. If constant relative risk aversion holds, however, there should be no significant difference between the HIGH ONE treatment and LOW ALL treatment. This is because those treatments were set up such that the difference in the expected payoff between option A and option B are equal for every decision. The statistical significance of the higher degree of risk aversion in the HIGH ONE treatment relative to the LOW ALL treatment suggests that probabilistic high payoffs elicit more realistic behavior than guaranteed payoffs that are scaled down in magnitude.

We took numerous meticulous steps in the setup of our experimental model to ensure that the effects of order were mitigated if not eliminated (see section "Experimental Design"). While these compose the most important and effective correction for any unwanted influence that order could have on our results, we also tested for order's effect econometrically. We began by generating dummy variables representing each of the 6 orders (see Appendix B) in which the decision sheets were presented. We then regressed these variables on the mid-CRRA for each treatment, omitting order 1 for control. The results of these regressions are detailed in table 6.

Table 6. Summary of regressions testing for correlation between order and mid-CRRA.

Explanatory Variable	Dependent Variable		
	mid-CRRA HIGH ALL (p-value)	**mid-CRRA HIGH ONE (p-value)**	**mid-CRRA LOW ALL (p-value)**
Order 2	0.11	0.26	-0.54
	(0.910)	(0.795)	(0.592)
Order 3	0.03	0.95	1.20
	(0.975)	(0.346)	(0.235)
Order 4	0.95	1.41	0.26
	(0.347)	(0.162)	(0.799)
Order 5	1.00	1.98*	-0.22
	(0.318)	(0.051)	(0.827)
Order 6	-0.63	0.24	-0.71
	(0.529)	(0.810)	(0.480)

Notes: Statistical significance indicated by *0.10, **0.05, and ***0.01 or better.

We found a correlation between order 5 and the risk coefficient of the HIGH ONE treatment (significant at the 10% level). This observation, however, does not fall into a consistent pattern that generates concern, and in all other cases, no correlation of any significance was found.

To further test for order effects, we generated dummy variables describing a particular decision sheet's orientation on the table with respect to the other sheets (left, right, or center). We regressed these variables on the mid-CRRA for each treatment (omitting the center placement for control). The results are outlined in table 7.

Table 7. Summary of regressions testing for correlation between position and mid-CRRA.

Explanatory Variable	Dependent Variable		
	mid-CRRA HIGH ALL (p-value)	**mid-CRRA HIGH ONE (p-value)**	**mid-CRRA LOW ALL (p-value)**
Left	0.51	0.22	-0.46
	(0.610)	(0.824)	(0.648)
Right	1.83*	-1.09	1.05
	(0.071)	(0.278)	(0.297)

Notes: Statistical significance indicated by *0.10, **0.05, and ***0.01 or better.

Table 7 shows a positive relationship between the mid-CRRA in the HIGH ALL treatment and placement of the HIGH ALL treatment's decision sheet on the right. However, this is not a trend that follows from our previous econometric test for order. The results from this model also validate our assumption that the “significant” correlation in the previous model is spurious. That is, while our first model showed a significant correlation between order 5 and the mid-CRRA of the HIGH ONE treatment, the only correlation of statistical significance in this second model concerns the HIGH ALL treatment, for which no significant relationship with order was found in the first model. It is more likely that these two instances of statistically significant correlations between risk-aversion and order are due to the small number of observations for each order and placement of decision sheets. The thoroughness of our experimental and econometric models with respect to controlling for order allows us to hold a great deal of confidence in the validity of our data’s indication that constant relative risk aversion does not hold true in our setup.

Table 8 reports the definitions and means of the variables of interest from our survey questions. Our sample includes a perfectly even mix of males and females, and 44% of subjects were nonwhite. There was not enough variation in the age of subjects to consider it a variable of interest, as nearly all subjects were recruited from freshman economics courses.

Table 8. Descriptive statistics of relevant survey variables.

Variable	Definition	Mean
mid-CRRA	Coefficient of relative risk aversion (see section "Model" for details)	0.645 (HIGH ALL) 0.519 (HIGH ONE) 0.467 (LOW ALL)
Order	Order of presentation of treatments (see section "Experimental Design" for details)	N/A
White	Equals 1 if subject is white; 0 otherwise	0.558
Male	Equals 1 if subject is male; 0 otherwise	0.500
Seatbelt	Frequency with which subject wears seatbelt while traveling in a vehicle (equals 1 if always, 2 if most of the time, 3 if sometimes, 4 if never)	1.198
Frequent Seatbelt Misuse	Subjects who answered that they sometimes do not wear their seatbelt	0.146
Speed Limit	Frequency with which subject drives over the speed limit (equals 1 if always, 2 if most of the time, 3 if sometimes, 4 if never)	2.659
Frequent Speeder	Subjects who answered that they drive over the speed limit "most of the time"	1.000
Gamble	Frequency with which the subject gambled over the past year (equals 1 if never, 2 if once or twice, 3 if between three and twelve times, 4 if more than twelve times)	1.479
Frequent Gambler	Subjects who answered that they gambled 3 or more times over the past year	0.083
Smoke	Frequency with which the subject smokes cigarettes (equals 1 if daily, 2 if some days, 3 if not at all)	2.979
Self-Financed	Equals 1 if subject is financing school with a job; 0 otherwise	0.242
Risk Count	Count and frequency of risky behaviors (seatbelt, speed limit, gamble, smoke) in which a subject participates	1.813

The survey included 4 questions that specifically concerned risky behavior. These were whether the subject smokes, gambles, wears a seatbelt, or drives over the speed limit. Of the 96 subjects, only 10 responded that they did not engage in any of the 4 risky behaviors. Only 2 subjects answered that they smoked occasionally, the rest answering not at all. 36% of subjects responded that they had gambled at least once or twice in the past year, 82% that they drove over the speed limit with some degree of regularity, and 15% did not always wear a seatbelt while traveling by car. The variable "Risk Count" was generated by adding up the number of the 4 risky behaviors in which a subject regularly engaged. In each case, a higher frequency of the risky behavior resulted in a larger number getting assigned to that risky behavior. For instance, if a subject answered that they wore a seatbelt "some of the time" instead of "most of the time," a 2 would be added to their risk count instead of a 1. If a subject answered that they drove over the speed limit "only once or twice," that variable was not added to their risk count as it is not a regularly recurring risky behavior. On average, subjects engaged in 2 risky behaviors.

We included a variable indicating whether or not a subject self-financed college with a job. 24% of subjects answered that they held some form of employment to finance college at the time of the experiment. Logically speaking, this could prove a very useful variable for predicting risky behavior. This is because the family of a subject who is employed will generally possess less wealth than the family of a subject who does not need to work a job while in college. We can hypothesize that the subject will exhibit risk averse behavior due to the higher relative weight of financial incentives for a subject who comes from a low income family. This variable is a unique and important feature of our model because the majority of experimental researchers assume uniform income due to subject pools consisting primarily of undergraduate students.

We ran several multivariate regressions on the mid-CRRA for each treatment to determine each variable of interest's effect on risk behavior. Table 9 lists each variable's coefficient of correlation on the mid-CRRA for each treatment, and the significance of the coefficients.

Table 9. Demographics and risk aversion.

Explanatory Variable	Dependent Variable		
	mid-CRRA HIGH ALL (p-value)	**mid-CRRA HIGH ONE (p-value)**	**mid-CRRA LOW ALL (p-value)**
Male	1.02	0.96	-0.15
	(0.309)	(0.341)	(0.882)
White	-0.05	1.07	0.48
	(0.962)	(0.287)	(0.663)
Self-Financed	2.41**	2.23**	0.08
	(0.018)	(0.029)	(0.935)

Notes: Statistical significance indicated by *0.10, **0.05, and ***0.01 or better.

Gender and race had no measurable effect on risk aversion. This result contrasts with existing research which has normally found gender to be strongly related with risk-behavior. There was, however, a strong, statistically significant relationship between the mid-CRRA in both the HIGH ALL and HIGH ONE treatments and students who answered that they self-financed college. This means that subjects who paid for college with a job generally exhibited a higher degree of risk aversion than those who didn't. Researchers normally do not control for wealth when a subject pool consists of students due to the difficulty of obtaining such information. This is because students generally do not work full-time, rendering it difficult to collect accurate figures pertaining to annual income or expenses. However, our findings provide a strong case for further controls related to the financial demographics of a subject pool in future research.

A point of interest amongst some researchers has been to determine whether a subject's risk-behavior in experimental settings can be used to predict a subject's participation in real life risky practices. For example, Anderson and Mellor (2008) examined whether risk averse behavior in their experiment predicted risky behaviors related to a subject's health habits. Similarly, Lusk and Coble (2005) used risk behavior in an experiment to see whether they could predict a subject's consumption of genetically modified food. To determine if risk loving behavior in our experiment predicted risky behaviors reported on the survey, we regressed the mid-CRRAs for each treatment (along with gender and race) on the total count of risky behaviors and each of the 4 variables representing frequent participation in risky behaviors reported on the survey (see Appendix D). A subject's regular participation in any of the 4 risky behaviors failed to predict risk loving behavior in our model. Conversely, table 10 shows that a subject's overall count of risky behaviors exhibited a statistically significant positive relationship with risk aversion in both the HIGH ALL and HIGH ONE treatments. Similar results were observed with subjects who reported that they regularly neglected to wear a seatbelt.

Table 10. Mid-CRRA and count of risky behaviors.

Explanatory Variable	**Risk Count**		
	Model 1 (p-value)	**Model 2 (p-value)**	**Model 3 (p-value)**
Male	1.39 (0.166)	1.39 (0.167)	1.68* (0.097)
White	2.00** (0.049)	1.70* (0.093)	1.93* (0.056)
mid-CRRA HIGH ALL	2.11** (0.037)		
mid-CRRA HIGH ONE		2.22** (0.029)	
mid-CRRA LOW ALL			1.24 (0.219)

Notes: Statistical significance indicated by *0.10, **0.05, and ***0.01 or better.

These findings stand in stark contrast to those of Anderson and Mellor (2008) who found that the 5 self-reported risky behaviors were significantly negatively correlated with risk averse behavior in their experiment. Similarly, Lusk and Coble (2005) found that risky behavior in their experiment was a significant determinant of a subject's acceptance of risky food.

Our unusual result that self-reported risky behavior is a determinant of risk aversion in experimental settings stems largely from the fact that the 5 subjects who exhibited the highest degree of risk aversion also exhibited higher-than-average risk counts. For example, 3 of the 5 subjects who made 8 or more safe decisions in the HIGH ALL treatment participated in 3 or more risky behaviors. Conversely, only one of the 11 subjects who displayed risk loving behavior in any of the 3 treatments participated in more than 2 risky behaviors. Because almost 70% of subjects exhibited risk averse behavior, this can be attributed to the fact that the 11 subjects with a low mid-CRRA in at least one of the 3 treatments did not collectively exhibit a greater than average risk count combined with the high count of risky behaviors amongst the small sample of individuals with the highest mid-CRRA. Thus, it is a problem due to sample size. This lack of correlation between risk loving behavior in the experiment and risky activities on the survey highlight a disjointedness between self-reported practices and behavior in experimental settings. This result is consistent with our finding that the LOW ALL and HIGH ONE pay schemes generated less risk averse behavior than the HIGH ALL treatment, in that greater incentives generate more risk averse behavior. In conjunction with our experimental results, this disjointedness raises concerns regarding the validity of hypothetical and probabilistic behavioral elicitation mechanisms.

6. Discussion and Conclusions

The importance of the presence and scale of financial incentives in human decision making experiments has been the focus of many studies. While psychologists generally hold that hypothetical setups in human experiments generate realistic behavior, the findings of our experiment indicate that both the scale and probability of financial incentives significantly influence the behavior of subjects. This finding is supported by the disjointedness observed between self-reported participation in risky behaviors and risky decision making in the laboratory. In experiments measuring risk behavior, this finding has weighty implications for budget constrained researchers seeking to elicit decisions that accurately predict a subject's risk aversion.

In all 3 treatments, our results conclusively show that constant relative risk aversion does not hold across varying scales and probabilities of financial incentives. We found that subjects generally exhibited a lower degree of risk aversion with diluted incentives, as indicated by the lower number of safe decisions made in the HIGH ONE and LOW ALL treatments. The scale and method of incentivizing behavior, therefore, should continue to be tested and carefully scrutinized when determining the validity of behavioral findings in experiments. Because scaled up incentives elicited risk averse behavior in our experiment, it would be appropriate for follow-up studies to scale up payoffs to much higher levels to conclusively determine the effect that the magnitude of the payoff generates.

When adding the variable of self-reported participation in risky behaviors, experimentally elicited behavior and hypothetical (self-reported) behavior appears to have an inverse relationship. However, our finding that self-financing college predicted risk averse behavior in the HIGH ALL and HIGH ONE treatments proves a potentially remarkable result. Because the variable of a subject's income is directly related to the relative scale of financial incentives and because experimental researches generally leave this variable out, it is possible that there is much more to explore with respect to its relationship to risk behavior in economics experiments. Future studies, therefore, should take a subject's income into consideration when examining the effects of financial incentives on behavior in experimental settings.

Appendix A. Instructions and decision sheets for the experiment

INSTRUCTIONS

ID Number:

You will be making choices between two lotteries, such as those represented as "Option A" and "Option B" below. Note that the actual payoffs amounts for your decisions will differ from those listed in these instructions. The money prizes are determined by throwing a ten-sided die. Each outcome, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, is equally likely. Thus if you choose Option A, you will have a 1 in 10 chance of earning $2.00 and a 9 in 10 chance of earning $1.60. Similarly, Option B offers a 1 in 10 chance of earning $3.85 and a 9 in 10 chance of earning $0.10.

Decision	Option A	Option B	Your Choice Circle One
1st	$2.00 if the die is 1 $1.60 if the die is 2 - 10	$3.85 if the die is 1 $0.10 if the die is 2 - 10	**A** or **B**

Each row of the decision table contains a pair of choices between **Option A** and **Option B**.

You make your choice by circling either "A" or "B" in the far right hand column of the table. Only one option in each row (i.e. for each Decision) can be circled.

Decision	Option A	Option B	Your Choice Circle One
1st	$2.00 if the die is 1 $1.60 if the die is 2 - 10	$3.85 if the die is 1 $0.10 if the die is 2 - 10	**A** or **B**
2nd . .	$2.00 if the die is 1 - 2 $1.60 if the die is 3 - 10	$3.85 if the die is 1 - 2 $0.10 if the die is 3 - 10	**A** or **B**

Even though you will make ten decisions, **only one** of these will end up being used. The selection of the one to be used depends on the throw of a ten-sided die. No decision is any more likely to be used than any other, and you will not know in advance which one will be selected, so please think about each one carefully. The first throw of the ten-sided die fixes the row (i.e. the Decision) that will be used to determine your earnings. For example, suppose that you make all ten decisions and the throw of the die is 9, then your choice, A or B, for decision 9 below would be used and the other decisions would not be used.

Decision	Option A	Option B	Your Choice Circle One
. . 9th	\$2.00 if the die is 1 - 9 \$1.60 if the die is 10	\$3.85 if the die is 1 - 9 \$0.10 if the die is 10	**A** or **B**

After the random die throw fixes the Decision row that will be used, we need to make a second die throw to determine the earnings for the Option you chose for that row. In Decision 9 below, for example, a throw of 1, 2, 3, 4, 5, 6, 7, 8, or 9 will result in the higher payoff for the option you chose, and a throw of 10 will result in the lower payoff.

Decision	Option A	Option B	Your Choice
9th	\$2.00 if the die is 1 - 9 \$1.60 if the die is 10	\$3.85 if the die is 1 - 9 \$0.10 if the die is 10	**A** or **B**
10th	\$2.00 if the die is 1 - 10	\$3.85 if the die is 1 - 10	**A** or **B**

For decision 10, the random die throw will not be needed, since the choice is between amounts of money that are fixed: \$2.00 for Option A and \$3.85 for Option B.

Making Ten Decisions: At the end of these instructions you will see tables with 10 decisions in 10 separate rows, and you choose by circling one choice (A or B) in the far right hand column for each of the 10 rows. You may make these choices in any order.

The Relevant Decision: One of the 10 rows (i.e. Decisions) is then selected at random, and the Option (A or B) that you chose in that row will be used to determine your earnings. Note: Please think about each decision carefully, since each row is equally likely to end up being the one that is used to determine payoffs.

Determining the Payoff for Each Round: After one of the decisions has been randomly selected, we will throw the ten-sided die a second time. The number is equally likely to be 1, 2, 3, ... 10. This number determines your earnings for the Option (A or B) that you previously selected for the decision being used.

Determining Who Gets Paid: In some cases, there will be a third die throw to determine which person in the room will be paid for the set of decisions on a particular sheet. The top of each decision sheet explains who will be paid for that particular decision sheet.

Determining the Final Payoff: There will be 3 decision sheets, each with 10 rows. You will find out your earnings for each of these 3 sheets after you have made all of your decisions today.

Instructions Summary

To summarize, you will indicate an option, A or B, for each of the rows by circling one choice in the far right hand column.

Then the throw of a ten-sided die fixes which row of the table (i.e. which Decision) is relevant for your earnings.

In that row, your decision fixed the choice for that row, Option A or Option B, and a final throw of the ten-sided die will determine the money payoff for the decision you made.

In addition, in some cases, there will be a third die throw to determine which person in the room will be paid for the set of decisions on a particular sheet. The top of each decision sheet explains who will be paid for that particular decision sheet.

This whole process will be repeated, but the prize amounts may change from one sheet to the next, so look at the prize amounts carefully before you start making decisions.

<u>EVERYONE IN THE ROOM</u> WILL BE PAID FOR 1 OF THE 10 DECISIONS ON THIS SHEET.

Decision	Option A	Option B	Your Decision Circle One
1	$4.00 if the die is 1 $3.20 if the die is 2-10	$7.70 if the die is 1 $0.20 if the die is 2-10	**A** or **B**
2	$4.00 if the die is 1 -2 $3.20 if the die is 3-10	$7.70 if the die is 1-2 $0.20 if the die is 3-10	**A** or **B**
3	$4.00 if the die is 1-3 $3.20 if the die is 4-10	$7.70 if the die is 1-3 $0.20 if the die is 4-10	**A** or **B**
4	$4.00 if the die is 1-4 $3.20 if the die is 5-10	$7.70 if the die is 1-4 $0.20 if the die is 5-10	**A** or **B**
5	$4.00 if the die is 1-5 $3.20 if the die is 6-10	$7.70 if the die is 1-5 $0.20 if the die is 6-10	**A** or **B**
6	$4.00 if the die is 1-6 $3.20 if the die is 7-10	$7.70 if the die is 1-6 $0.20 if the die is 7-10	**A** or **B**
7	$4.00 if the die is 1-7 $3.20 if the die is 8-10	$7.70 if the die is 1-7 $0.20 if the die is 8-10	**A** or **B**
8	$4.00 if the die is 1-8 $3.20 if the die is 9-10	$7.70 if the die is 1-8 $0.20 if the die is 9-10	**A** or **B**
9	$4.00 if the die is 1-9 $3.20 if the die is 10	$7.70 if the die is 1-9 $0.20 if the die is 10	**A** or **B**
10	$4.00 if the die is 1-10	$7.70 if the die is 1-10	**A** or **B**

Result of first die throw (to determine Decision): ___________

Result of second die throw (to determine payoff): ___________

Payoff: ___________

<u>EVERYONE IN THE ROOM</u> WILL BE PAID FOR 1 OF THE 10 DECISIONS ON THIS SHEET.

Decision	Option A	Option B	Your Decision Circle One
1	$32.00 if the die is 1 $25.60 if the die is 2-10	$61.60 if the die is 1 $1.60 if the die is 2-10	**A** or **B**
2	$32.00 if the die is 1 -2 $25.60 if the die is 3-10	$61.60 if the die is 1-2 $1.60 if the die is 3-10	**A** or **B**
3	$32.00 if the die is 1-3 $25.60 if the die is 4-10	$61.60 if the die is 1-3 $1.60 if the die is 4-10	**A** or **B**
4	$32.00 if the die is 1-4 $25.60 if the die is 5-10	$61.60 if the die is 1-4 $1.60 if the die is 5-10	**A** or **B**
5	$32.00 if the die is 1-5 $25.60 if the die is 6-10	$61.60 if the die is 1-5 $1.60 if the die is 6-10	**A** or **B**
6	$32.00 if the die is 1-6 $25.60 if the die is 7-10	$61.60 if the die is 1-6 $1.60 if the die is 7-10	**A** or **B**
7	$32.00 if the die is 1-7 $25.60 if the die is 8-10	$61.60 if the die is 1-7 $1.60 if the die is 8-10	**A** or **B**
8	$32.00 if the die is 1-8 $25.60 if the die is 9-10	$61.60 if the die is 1-8 $1.60 if the die is 9-10	**A** or **B**
9	$32.00 if the die is 1-9 $25.60 if the die is 10	$61.60 if the die is 1-9 $1.60 if the die is 10	**A** or **B**
10	$32.00 if the die is 1-10	$61.60 if the die is 1-10	**A** or **B**

Result of first die throw (to determine Decision): ___________
Result of second die throw (to determine payoff): ___________
Payoff: ___________

ONE PERSON OUT OF THE 8 PEOPLE IN THE ROOM WILL BE PAID FOR 1 OF THE 10 DECISIONS ON THIS SHEET.

Decision	Option A	Option B	Your Decision Circle One
1	$32.00 if the die is 1 $25.60 if the die is 2-10	$61.60 if the die is 1 $1.60 if the die is 2-10	**A** or **B**
2	$32.00 if the die is 1 -2 $25.60 if the die is 3-10	$61.60 if the die is 1-2 $1.60 if the die is 3-10	**A** or **B**
3	$32.00 if the die is 1-3 $25.60 if the die is 4-10	$61.60 if the die is 1-3 $1.60 if the die is 4-10	**A** or **B**
4	$32.00 if the die is 1-4 $25.60 if the die is 5-10	$61.60 if the die is 1-4 $1.60 if the die is 5-10	**A** or **B**
5	$32.00 if the die is 1-5 $25.60 if the die is 6-10	$61.60 if the die is 1-5 $1.60 if the die is 6-10	**A** or **B**
6	$32.00 if the die is 1-6 $25.60 if the die is 7-10	$61.60 if the die is 1-6 $1.60 if the die is 7-10	**A** or **B**
7	$32.00 if the die is 1-7 $25.60 if the die is 8-10	$61.60 if the die is 1-7 $1.60 if the die is 8-10	**A** or **B**
8	$32.00 if the die is 1-8 $25.60 if the die is 9-10	$61.60 if the die is 1-8 $1.60 if the die is 9-10	**A** or **B**
9	$32.00 if the die is 1-9 $25.60 if the die is 10	$61.60 if the die is 1-9 $1.60 if the die is 10	**A** or **B**
10	$32.00 if the die is 1-10	$61.60 if the die is 1-10	**A** or **B**

Result of first die throw (to determine Decision): ___________

Result of second die throw (to determine payoff): ___________

Result of third die throw (to determine which person in the room will be paid): _________

Payoff: ___________

Appendix B. Codes for order, treatments, and die throws

	Left	Middle	Right
Order 1	High All (treatment 1)	High One (treatment 2)	Low All (treatment 3)
Order 2	High All (treatment 1)	Low All (treatment 3)	High One (treatment 2)
Order 3	High One (treatment 2)	High All (treatment 1)	Low All (treatment 3)
Order 4	High One (treatment 2)	Low All (treatment 3)	High All (treatment 1)
Order 5	Low All (treatment 3)	High One (treatment 2)	High All (treatment 1)
Order 6	Low All (treatment 3)	High All (treatment 1)	High One (treatment 2)

1st Die	Picks the decision to be paid for a particular sheet
2nd Die	Determines the payout for the chosen decision
3rd Die	Determines who gets paid for “pay one” treatment

Appendix C. Closing survey

Questionnaire Title: Closing Survey

Welcome Statement: At this time, we would like all participants to complete this survey. All information provided in this survey will be treated as confidential and can not be used to identify individual participants. We will not ask for your name, address, or other personal information that can identify you. Please try to complete the entire survey, but you can choose not to answer certain questions if you don't want to, and you can end the survey at any time. All information you provide will be kept confidential.

(ID_Number) Please enter the ID Number written on the index card at your desk.

(Gender) What is your gender?

- Male *(1)*
- Female *(2)*
- I prefer to not answer this question. *(3)*

(Race) What category best describes your racial and ethnic background?

- White or Caucasian *(1)*
- Black or African American *(2)*
- Hispanic *(3)*
- Asian/Asian-American *(4)*
- Multiracial or other *(5)*
- I prefer to not answer this question. *(6)*

(Seatbelt) How often do you wear a seatbelt when driving or riding in a car?

- Always, or almost always *(1)*
- Most of the time *(2)*
- Some of the time *(3)*
- Never, or almost never *(4)*
- I prefer to not answer this question. *(5)*

(Drive_ Over_Speed_Limit) If you drive a car, how often do you drive over the speed limit?

- Always, or almost always *(1)*
- Most of the time *(2)*
- Some of the time *(3)*
- Never, or almost never *(4)*
- Not applicable; I don't drive a car *(5)*
- I prefer to not answer this question. *(6)*

(Gamble) How often have you gambled or purchased lottery tickets in the last year?

- Never *(1)*
- Once or twice *(2)*
- Between three and twelve times *(3)*
- More than 12 times *(4)*
- I prefer to not answer this question. *(5)*

(Smoke) Do you smoke cigarettes every day, some days, or not at all?

- Every day *(1)*
- Some days *(2)*
- Not at all *(3)*
- I prefer to not answer this question. *(4)*

(Finance) How do you finance your college education? Check all that apply.

- Scholarship(s) *(1)*
- Student Loans *(2)*
- Income from part-time or full-time jobs *(3)*
- Parent/Guardian contributions *(4)*
- Other *(5)*
- I prefer not to answer this question. *(6)*

Closing Statement: Thank you for completing the survey. Please remain seated momentarily and someone will come to your desk to pay you for your participation in the experiment.

Appendix D. Experimental predictors of self-reported risky behavior

Explanatory Variable	**Risk Count**		
	Model 1 (p-value)	**Model 2 (p-value)**	**Model 3 (p-value)**
Male	1.39 (0.166)	1.39 (0.167)	1.68* (0.097)
White	2.00** (0.049)	1.70* (0.093)	1.93* (0.056)
Mid-CRRA HIGH ALL	2.11** (0.037)		
Mid-CRRA HIGH ONE		2.22** (0.029)	
Mid-CRRA LOW ALL			1.24 (0.219)

Notes: Statistical significance indicated by *0.10, **0.05, and ***0.01 or better.

Explanatory Variable	**Smoke**		
	Model 1 (p-value)	**Model 2 (p-value)**	**Model 3 (p-value)**
Male	-0.93 (0.357)	-1.04 (0.303)	-1.11 (0.270)
White	-0.93 (0.353)	-0.90 (0.372)	-0.90 (0.373)
Mid-CRRA HIGH ALL	-1.29 (0.201)		
Mid-CRRA HIGH ONE		-0.24 (0.812)	
Mid-CRRA LOW ALL			-1.60 (0.113)

Notes: Statistical significance indicated by *0.10, **0.05, and ***0.01 or better.

Explanatory Variable	**Frequent Gambler**		
	Model 1 (p-value)	**Model 2 (p-value)**	**Model 3 (p-value)**
Male	0.98 (0.330)	1.00 (0.321)	1.18 (0.241)
White	0.79 (0.431)	0.71 (0.481)	0.79 (0.433)
Mid-CRRA HIGH ALL	1.39 (0.167)		
Mid-CRRA HIGH ONE		0.88 (0.380)	
Mid-CRRA LOW ALL			-0.13 (0.897)

Notes: Statistical significance indicated by *0.10, **0.05, and ***0.01 or better.

Explanatory Variable	**Frequent Speeder**		
	Model 1 (p-value)	**Model 2 (p-value)**	**Model 3 (p-value)**
Male	-0.62 (0.536)	-0.68 (0.499)	-0.77 (0.441)
White	-0.65 (0.517)	-0.59 (0.556)	-0.64 (0.523)
Mid-CRRA HIGH ALL	-1.05 (0.295)		
Mid-CRRA HIGH ONE		-0.49 (0.625)	
Mid-CRRA LOW ALL			-0.17 (0.866)

Notes: Statistical significance indicated by *0.10, **0.05, and ***0.01 or better.

Explanatory Variable	**Frequent Seatbelt Misuse**		
	Model 1 (p-value)	**Model 2 (p-value)**	**Model 3 (p-value)**
Male	-1.18 (0.241)	-1.23 (0.221)	-0.95 (0.346)
White	-2.32** (0.023)	-2.47** (0.016)	-2.37** (0.020)
Mid-CRRA HIGH ALL	1.85* (0.068)		
Mid-CRRA HIGH ONE		2.04** (0.044)	
Mid-CRRA LOW ALL			1.97* (0.051)

Notes: Statistical significance indicated by *0.10, **0.05, and ***0.01 or better.

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