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Examining the Effects of Framing on Probability Discounting

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EXAMINING THE EFFECTS OF FRAMING ON PROBABILITY DISCOUNTING

by

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Submitted in Partial Fulfillment

of the requirements for the degree of

Bachelor of Arts

in

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Abstract

Probability discounting is the process by which people choose a smaller, more-likely reward instead of a larger, less-likely reward (McKerchar & Renda, 2012). While this phenomenon has been well documented, very few studies have tested discounting experimentally using real money. The present experiment was designed to remedy this by replicating a study by Weatherly and Derenne (2013) which showed that undergraduate students discounted money they believed they had won more than money they believed they were owed. 27 undergraduate students were asked to either complete a simple cognitive task or roll a die. The participants in the *owed condition* were told that completion of the cognitive task had earned entry into a lottery worth \$50 with a 5% chance of winning, and participants in the *won condition* were told that entry into the lottery had been contingent on rolling an even number. If they rolled an odd number, then the participant was informed that he or she would receive no reward. Then participants in both conditions were asked if they would accept \$3.00 now instead of the lottery ticket. The results, contrary to prediction, were that participants were no more likely to pick the lottery in the owed condition than in the won condition. Various possible reasons for the failure to confirm the hypothesis were discussed.

Keywords: framing, discounting, behavioural economics, decision making

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General Introduction

Despite the still-popular philosophical belief that humans are rational animals, there is much evidence to the contrary (De Martino, Kumaran, Seymour, Dolan, 2006). A host of biases and other influences control our decision-making process which make people frequently inconsistent in the choices they make.

Kahneman and Tversky (1981) did much of the early work on *framing effects* on decision making. The researchers gave undergraduate students pairs of hypothetical decisions they had to choose between. In the first study they outlined, the researchers asked participants first whether they would accept a sure gain of \$250 or a 25% chance to gain \$1000. Then participants were asked if they would accept a sure loss of \$750, or a 75% chance of losing \$1000, with a 25% chance of losing nothing.

In the first situation, participants chose a “risk-averse” option; that is, they were more likely to pick a sure gain of \$250 than risk gaining nothing (Kahneman & Tversky, 1981). However, participants were more likely to accept a “risky” option in the second scenario; that is more likely to pick a 75% chance of losing \$1000 than just accepting the \$750 loss. The authors argued that if the participants were acting rationally, they would have selected the same option for both scenarios. However, there is a near-perfect shift between the two conditions with 84% selecting the risk-averse option in Scenario 1, and 87% selecting the risky option in Scenario 2 (Kahneman & Tversky, 1981). Participants were not behaving rationally, but rather were under the influence of the “framing” of the question.

Before these irrational decision-making effects were studied in humans, they were originally noticed in the animal literature. For instance, Mazur (1984) determined that animals were more likely to select an immediate, or more probable reward, than to wait for the

opportunity to get a better reward later. Mazur termed this *discounting*—the process by which a larger reward is worth less to the animal because of its delay or low probability.

Mazur (1984) used pigeons to determine the delay at which the size of a reinforcer was no longer a factor in decision making. This *indifference point* (Mazur, 1984) is the delay at which the animal will pick both a large reward later and a small immediate reward with equal frequency. To determine this indifference point, Mazur gave the pigeons two keys on which they were freely able to peck. In one trial, one of these keys provided a consistent, small reward for the subject. The other key sometimes gave a larger reward, and sometimes did not (Mazur, 1984). Mazur varied the probability that the larger reward would appear, and varied the size of the two rewards.

This work is similar to that done by Kahneman and Tversky (1981) because it shows that decisions are based primarily on the way that they are presented to the individual. If one cannot make decisions consistently, despite the underlying factors, then one cannot be said to be rational.

People are also likely to engage in discounting behaviour (McKerchar & Renda, 2012). A study using undergraduate students determined that delays played a significant factor in whether they would choose a small reward over the maximum reward of \$1000 (Rachlin, Raineri, & Cross, 1991). Researchers gave participants a questionnaire and asked them to pick which of two sums of money they would accept varying delays (Rachlin et al., 1991). The researchers began by asking participants if they would pick \$1000 today or \$1000 in one month. They then asked if the participants would choose \$990 today or \$1000 in a month, \$980 today or \$1000 in a month, etc. (Rachlin et al., 1991). It was found that after a certain point, participants began choosing the smaller sum of money, despite the surety of getting the full sum in one

month. Rachlin et al. (1991) performed the same experiment for probabilistic discounting—the idea that one will choose a smaller, more-likely sum of money, over a larger less-certain sum. Again, the researchers found that the participants began to discount the hypothetical money depending on how likely it was to occur. Using these data, the researchers were able to determine an indifference point for people. This demonstrated that, given the right conditions, people will accept a significantly smaller amount of money than a delayed larger amount if it is given immediately.

Many subsequent studies have confirmed that an “instant gratification effect” occurs for both animals and people (Green & Myerson, 2004). Both in the case of discounting, and in the case of probability, people consistently tend to choose a smaller reward rather than wait for the opportunity to have a larger reward. While people are consistent, this is irrational because they are denying themselves the opportunity to gain more.

The reason why this effect ought to be viewed as irrational is because the circumstances in the study are presented *ceteris paribus*. Outside of the context of a study, it could be argued that the rational decision is to discount money because one cannot be sure of the circumstances of the future. In the context of the study, especially with delay discounting, there is a 100% chance of receiving the money if the participant just chooses to wait a bit. Therefore, to discount this original sum of money is a poor decision.

Recently, Weatherly and Derenne (2013) examined university students’ discounting of “won” versus “owed” money. Participants were presented with two scenarios: one in which they were winners in a national sweepstakes; and another in which they were owed the money. It was found that participants discounted the “won money” more than the “owed money” when asked “How much money would you accept today if you could not have the full amount?” (Weatherly

& Derenne, 2013). This study showed that the value of rewards is dependent on the ways in which they are framed by context, which points to further irrational judgement in people's decision processes.

Johnson and Bickel (2002) argued that discounting literature would only be valid if it could be replicated in an experimental environment. Their study involved six adults who were asked to make a series of choices about accepting a smaller amount of money now or a larger amount of money later (Johnson & Bickel, 2002). The participants were told which of their choices were "real" choices, and which were "hypothetical". This means that some of the choices involved real amounts of money that the participants would be given after the study, and some of the choices were not. The researchers found that there was no difference between the conditions, and that the hypothetical rewards were discounted to the same extent as the real rewards (Johnson & Bickel, 2002). However, this lack of difference might have been due to the nature of the within-subjects design. Furthermore, the number of participants Johnson and Bickel (2002) tested was small, and so it is difficult to claim that it supports their hypothesis. To properly understand the nature of this difference, a between-subjects design is necessary. For this reason, the goal of the present study was to replicate the findings of Weatherly and Derenne (2013) in an experimental environment.

The present experiment is an extension of the work done by Weatherly and Derenne (2013). It was designed to replicate their finding that undergraduate students discounted won money more than they discounted owed money; however, it involved real money rather than hypothetical money, because it is important to be able to replicate the results of a hypothetical study in an experiment. Furthermore, the situations Weatherly and Derenne (2013) presented in their original study to test probability discounting were dissimilar, and therefore open to

confounds. For instance, it is possible that the differences found in the conditions came from irrelevant features of the story given to participants. The researchers in the original study told participants that a person owes them money and is unreliable, or that the manager of a lottery calls them up and asks them to drop out. In the first, it may not be the fact that the money is owed that causes participants to take a discounted amount, it may be that the person is unreliable. Further, it may be that a person in authority calls the participant up and asks them to remove their name from the lottery that prompts them to accept a smaller amount. The present experiment was designed to mitigate the effects of bias and irrelevant features by making the won and owed conditions as similar as possible.

In the present experiment, participants were given the choice of a less-likely reward later and a more-likely reward in that moment. The experiment was designed to test probability discounting and not delay discounting, even though the less likely reward is presented later. *Delay discounting* occurs when people take a smaller reward because they can get it sooner than the larger reward presented later (Mazur, 1984). *Probability discounting* is different in that people discount a reward because they're less likely to receive it. Weatherly and Derenne (2015) performed a subsequent study to determine that probabilistic discounting and delay discounting were unrelated effects. A delay did not affect the decision-making process of participants given a probabilistic discounting choice (Weatherly & Derenne, 2015). Therefore, the present experiment involved a delayed reward in the form of a lottery draw at the end of the research period, but this was likely not an issue to the overall findings of the study.

It was hypothesized that the results of Weatherly and Derenne (2013) could be replicated in an experimental environment, and that participants would be more likely to discount money in the “won” condition than in the “owed” condition.

Pilot Study

For this experiment to be successful, the researchers first needed to determine the value used as a discounted reward. In previous discounting studies, the researchers traditionally ask the participants what amount of money they would accept in exchange for the larger, less likely reward (McKercher, 2012). The researchers then computed how much the more likely reward was discounted relative to the less likely reward. In the case of Weatherly and Derenne (2013), this method was used to determine whether won or owed money was discounted more.

This method would not be feasible in an experimental setting because there is too much variability in the possible answers people might accept. For this reason, I sought to determine an indifference point that could later be used in the main experiment. This then enabled me to leave the participants with a simple choice between a full reward and a discounted reward.

Method

Participants

For the pilot study, 17 undergraduate students, who were friends and acquaintances of the researcher, were recruited from Huron University College.

Procedure

Participants were approached in the student lounge and asked if they wished to participate in a short study on decision making. They were handed a letter of information, and consent was received in the form of writing. Participants were then asked to imagine a scenario where they had been entered for a chance to win a lottery of \$50, and that the chances of winning the lottery were 5%. They were then asked, “What is the lowest amount of money you would accept in exchange for forfeiting your chance to win the lottery?” It was stressed to participants that their answer ought to reflect the *lowest* amount of money they would accept, and not just any

value at all. Responses were recorded, and participants were debriefed on the reason for the question.

Results and Discussion

The mean of the responses was recorded ($M = \$14.00$, $SD = \$14.72$). Half chose a value between 2.5 and 5 ($M = 4.37$, $SD = 1.16$). Although the mean response was \$14.00 accepted as a minimum value for forfeiting the lottery, this was likely due to high-scoring outliers. The mode (most number of responders) chose between \$2.50 and \$5.00 as their lowest sum taken. This is consistent with the mathematical expected value of winning the lottery. Since participants were told that they had a 5% chance of winning \$50, many participants chose \$2.50 as their preferred lower value. As a result, the researcher decided to take that value and add \$0.50 to it, making the amount \$3.00, to accommodate those who might want a little bit more.

Some responses were neglected from final analysis because the reasons they gave for responding seemed inconsistent with the literature. For instance, one participant responded that she would accept no less than \$37.95, because that is the price of a 24 pack of beer.

Main Experiment

I predicted two results. I hypothesized that the effects of the frame used in this study would be more powerful than that used by Weatherly and Derenne's (2013). Since the choices are not hypothetical, but real, participants should be more likely to believe that they either actually "won" money, or actually had money "owed to them". A manipulation check question was asked of participants to determine the effectiveness of the prime.

Since the results of the frame were predicted to be stronger, I further hypothesized that the discounting would mirror that reported by Weatherly and Derenne (2013). Participants should show more discounting behaviour in the won condition than in the owed condition. In

other words, participants should be more likely to accept a chance to win the lottery when they believed they had won the money, than when they believed the money had been owed to them by the researcher.

Method

Participants

Participants were 27 undergraduate students studying at Huron University College. Of these participants, the data from four were removed because they did not roll the correct number and therefore did not win a chance to enter the lottery in the “won” condition, and therefore the researcher could not proceed with the rest of the experiment. Participants were gathered using social media posts on Facebook, direct messages, and through posters placed around the college. Huron University College is a small liberal arts undergraduate university college affiliated with the University of Western Ontario.

Materials and Procedures

Participants were informed that they were taking part in a study on decision making and reward appraisal via a letter of information. The specific nature of the study was left vague, but participants were told that by participating they would have an opportunity to receive a monetary reward. If the participants agreed to participate, they were asked to sign a consent form. In the “Owed” condition, participants were told that by completing a sheet of simple math problems (Appendix A), they would be entered for a chance to win \$50, where the chances of winning were 5%. Upon completion of the subtraction sheet, participants were then told that they could forfeit their lottery entry for \$3 in change at that moment. A \$1 and a \$2 coin were placed in front of the participants.

In the “Won” condition, participants were told that if they could roll an even number on a die, then they would be entered for a chance to win a \$50 lottery. If the participants rolled an even number, then the researcher excitedly told them that they had won their chance to enter the lottery. If the participant rolled an odd number, then the researcher gave the participant a second chance (“Best two out of three”). If they rolled an even number on the second or third try, then they were entered for a chance to win a lottery. As with the “Owed” condition, participants were told that they could forfeit their lottery entry for \$3 in change. If the participant again rolled an odd number, then they were thanked for their time and debriefed on the nature of the study.

In both conditions, responses were recorded, and participants were given a brief question sheet to test the effectiveness of the framing (Appendix B). Participants were asked to rate on a scale of (1) to (10), (1) being “Not at all”, and (10) being “Very much”, how much they felt they had either won or were owed the money. Finally, participants were thanked for their time and debriefed on the nature of the study.

Results

A manipulation check was conducted for both conditions. Participants in the owed condition ($M = 5.68, SD = 2.01$) did seem to answer differently from participants in the won condition ($M = 7, SD = 3.35$). However, because participants were not given the same question, it is difficult to compare these two conditions.

Next, a chi-square test of independence was run. No relationship was found between whether the participants were in the owed condition or won condition, and their decision to accept or decline the immediate value, $X^2 = 0.32, p > .05$. Yates’ correction was applied. Participants were equally likely to take the discounted money in the owed condition as they were

to take the discounted money in the won condition. Table 1 summarizes the answers of participants and the resulting chi square value.

General Discussion

The results of this study show that there was no difference in the frequency with which participants picked the discounted reward depending on condition. Participants were just as likely to take the discounted reward if it was framed as owed as if it was framed as won. Furthermore, the manipulation checks, revealed that the attempts to create “owed” and “won” beliefs had been unsuccessful so these results are likely due to an ineffective frame. The owed condition manipulation was ineffective at convincing participants that they had earned the money. The won condition frame was slightly more successful at convincing people that they had truly won the money, but the results indicate that these conditions were not significantly different. In this discussion, I will first consider the implications of the results in general. Next, I will consider the flaws in the experiment, and recommend ways to remedy these flaws in a future study. Finally, I will give a brief discussion on discounting research in general, and possible future directions for research in this field.

As mentioned above, the results indicate that participants were no more likely to pick \$3.00 or \$50 in either condition. This means that participants picked \$3.00 half of the time and \$50 half of the time which is consistent with Mazur’s concept of *indifference point* (Mazur, 1984). At the very least, this experiment supports the notion that there is a point at which people will randomly pick one value or another. It is also interesting to note that this indifference point was \$0.50 over the expected value of the lottery—which is \$2.50. This means that taking the \$3.00 is the rational choice, because one is likely to make more money this way. Discounting is

Summary of Chi-Square Test of Independence

Table 1

Framing of condition	Discounted reward taken		χ^2
	Yes	No	
Owed	8 (9.1)	7 (5.9)	0.32*
Won	6 (4.9)	2 (3.1)	

* $p > .05$

founded on the assumption that it is not in the best interest of the person to take a smaller amount of money (Mazur, 1984), however in the context of this experiment it was in the best interest of

the participant to take the discounted amount. Further research should be conducted on this phenomenon to explore how the discounted amount affects decision making when it is truly more rational.

Since the owed condition did not effectively frame the experiment, it could be thought of as a control condition. This study replicated the results of past research on discounting because a near equal number of participants picked the discounted reward as picked the lottery entry. Conversely, this shows just how ineffective the frame was. If participants believing that money was owed were to have any effect on the results, then it would have been seen here.

In the owed condition, participants may not have believed that the subtraction task warranted a monetary reward. Since the task was short, the reward would have been unexpected addition to the study rather than a motivating factor in its completion. In the original study by Weatherly and Derenne (2013), the participants were asked the following question:

You are owed \$X, but the chance that the person who owes you the money will be able to repay it is Y%. Otherwise, the person will declare bankruptcy and you will not be repaid anything. The person who owes you the money can guarantee paying you back a certain amount, but that amount will be less than \$X. What is the smallest amount of money you would be willing to be guaranteed to be repaid rather than having a Y% chance of getting back your \$X? (Weatherly & Derenne, 2013, p. 74)

In this original condition, participants would likely have had an emotional attachment to the money that they are owed—if they do not accept less money, then the person who owes them money may declare bankruptcy. In the current experiment's owed condition, the entry into the lottery is extra money they may win by participating. In the original study, the money is framed as money that the participant spent, and now must be reimbursed for. It makes sense that people

would ascribe more value to their money in this original condition, but not necessarily ascribe the same value to money in the experiment.

Not only would participants not consider the lottery win as valuable, as the money that they are owed is owed by a friend, as many of the participants were gathered as a personal favour to the researcher. This means that their primary motivation might have been to help and not to earn money. Many participants may have been acting according with the norm of reciprocity (Ercolani, Gallucci, Perugini, & Presaghi, 2003). When people are in close relationships, they become less concerned about receiving a “tit-for-tat” reward (i.e., they are less concerned about whether the researcher is specifically offering a reward for completing a study) (Clark & Mills, 2012). Rather, participation in the study might have been part of establishing a larger social relationship with me. They would have been unconcerned with immediate reciprocity, and known that I would pay them back in some form over time as per the communal relationship dynamic (Clark & Mills, 2012).

In a revised version of this experiment, more emphasis would have to be placed on the value of money. First, the cognitive task the participants complete would have to resemble an existing psychology study, such as the Stroop task. This would prevent suspicion when the researcher offers the discounted money. The longer and more intricate the task is, the less likely it is that the participant would focus on the decision to accept a discounted sum of money as significant.

Next, the researcher ought to emphasize the lottery win as a major reward for completing the study. This means that when advertising the study, ask potential participants if they want to win some money, and not if they want to complete a psychology study. The researcher should be making constant references to the lottery during the experiment. It would be good to clearly

focus on contingency. For instance, “If you complete this next piece, then you can enter to win the lottery”. This will directly connect the lottery with the task, and make the lottery feel less like an afterthought of the study.

The participants in the won condition did not believe any more that they won the money than participants in the owed condition believed like the money was owed to them. This is despite the fact that entry in the lottery in the won condition was genuine. Participants had a 50% chance of not winning the money. The concern in this study was making the win completely distinct from a believing that the participants had earned the money. For instance, if the participants were asked to compete in a game with other people, and they ultimately win the game, it would be a qualitatively different type of win than that of rolling a die. Participants might have believed that they did earn the money because they performed well.

Furthermore, the won condition in the current experiment was different from that used in the original study. It is important to note that in the original study, participants were not primed to believe they had won anything before being given the option either to take a full amount of money or a discounted sum. In the original Weatherly and Derenne (2013) study, participants were asked the following:

You are a finalist in a national sweepstakes. You have a Y% chance of winning \$X. If your number is not called, however, you do not receive anything. The organization running the sweepstakes is willing to guarantee to pay you a certain amount of money if you agree to remove your name from the sweepstakes. What is the smallest amount of money would you be willing to accept rather than having a Y% chance of winning \$X? (Weatherly & Derenne, 2013).

If the researcher running the current experiment had wished to truly replicate this question in a tangible context, he would have simply given participants in the “won” condition the choice of either \$3.00 or a lottery ticket worth \$50.00. Instead, what the researcher in this experiment did was prime the participants to believe they had either won the chance to win money or the chance

to win money that was owed to them. While the results are insignificant, this is still a qualitatively different scenario than one that was discussed by Weatherly and Derenne (2013).

The question mentioned above originally written by Weatherly and Derenne (2013) posits a scenario in which the possibility of winning money is entirely based on chance. So, any future study should maintain that element of chance so that participants do not believe they earned the money. I propose a lottery, wherein participants would be asked to participate and then given the opportunity to drop out later. This might make the nature of the study less transparent while still protecting the integrity of the won condition.

More research should be done with respect to whether different types of wins produce different responses. As mentioned above, a “win” condition in a future study should not include anything that makes the participant believe that they have earned the reward. For instance, even in a game of *Monopoly* (win conditions are almost entirely based on successfully landing on the right properties), people are likely to believe a sense of accomplishment. However, it would be worthwhile to study whether participants in a “win” condition where the first win is a lottery would be more likely to chance the lottery a second time. This would be contrary to Weatherly and Derenne (2013), but would make sense in the context of people’s other cognitive biases.

Since the frame proved to be ineffective in this study, the first step for continuing this research should be to address the problems highlighted above. However, the next step should be to analyze the effects of a successful frame in this experiment.

Framing has been generally shown to be effective at influencing decision-making (Levin, Gaeth, & Schreiber, 2002). However, research has shown that certain individual differences can alter the effects of a frame (Huangfu, 2014). Especially in high risk scenarios, a frame showed to

have stronger effects on those with weaker risk-taking tendencies, and a weaker effect on those with strong risk-taking tendencies (Huangfu, 2014).

These factors should be taken into consideration for a future study. It could be the case that risk-taking tendencies act as a moderating factor in the relationship between picking a discounted amount of money in the won and owed conditions, and picking the lottery win. Participants who are more likely to take risks, and feel that they are owed the money would be the least likely to discount money. Conversely, that the stakes of the won condition are lower (people care about the money less), researchers should expect to see that people with weak risk-taking tendencies are more likely to take the lottery in the won condition than in the owed condition.

This hypothesis is contrary to the findings of Weatherly and Derenne (2013) since people are likely to take a discounted sum of money they feel they won the money. This hypothesis suggests that despite people taking a discounted sum of money.

Another factor that could affect a frame is people's preconceived notions about money. The participants for this experiment were all pulled from a liberal-arts school in Southwestern Ontario. Western University tends to attract students of higher socioeconomic status (SES). This is evidenced in the fact that 51.8% of students are primarily supported by their parents' income (Western University, 2017). Weatherly and Derenne's study explicitly chose to test wealthier undergraduates as well. This might well influence appraisal of money.

People of lower SES tend to appraise money differently than those of higher SES (Daly, 2017). Daly's work shows that while a person living comfortably may see money in practical ways, people of lower income often have it factor into identity (Daly, 2017).

In the context of discounting and framing research, this suggests that research using participants other than undergraduates might show differing results. People of lower SES may see owed money as important to receive for identity. They would be even less likely to accept a discounted sum of money when it is owed to them than those of higher SES.

Finally, future research on probability discounting and framing should consider that Weatherly and Derenne (2013) did not find that participants only discounted money in one condition, but that they discounted in both conditions unequally. The present experiment assumed that some participants would not discount money in the owed condition, but would discount it in the won condition. A future experiment should aim to measure the rate at which participants discount won or owed money, and not whether the money is discounted at all.

A future study ought to take into consideration the population tested and the way that the conditions are designed. First, the researchers carrying out a future study ought to consider the way to produce an effective frame. The present study had participants either roll a die or complete a cognitive task; a future study ought to either offer money as owed or offer it in the form of a lottery that is later discounted. Second, a future study ought to test a more diverse population. Since Weatherly and Derenne (2013) can only claim results about undergraduate students, the next step ought to be to study how different people respond to these frames.

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Appendix I

Subtraction Facts to 18 (A)

$$\begin{array}{r} 3 \\ - 0 \\ \hline \end{array} \quad \begin{array}{r} 2 \\ - 1 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ - 1 \\ \hline \end{array} \quad \begin{array}{r} 9 \\ - 7 \\ \hline \end{array} \quad \begin{array}{r} 13 \\ - 7 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ - 1 \\ \hline \end{array} \quad \begin{array}{r} 8 \\ - 2 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ - 1 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ - 1 \\ \hline \end{array} \quad \begin{array}{r} 12 \\ - 7 \\ \hline \end{array} \quad \begin{array}{r} 9 \\ - 6 \\ \hline \end{array} \quad \begin{array}{r} 10 \\ - 5 \\ \hline \end{array} \quad \begin{array}{r} 9 \\ - 4 \\ \hline \end{array} \quad \begin{array}{r} 9 \\ - 5 \\ \hline \end{array} \quad \begin{array}{r} 10 \\ - 6 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ - 0 \\ \hline \end{array}$$

$$\begin{array}{r} 14 \\ - 8 \\ \hline \end{array} \quad \begin{array}{r} 8 \\ - 8 \\ \hline \end{array} \quad \begin{array}{r} 11 \\ - 3 \\ \hline \end{array} \quad \begin{array}{r} 13 \\ - 5 \\ \hline \end{array} \quad \begin{array}{r} 12 \\ - 5 \\ \hline \end{array} \quad \begin{array}{r} 8 \\ - 6 \\ \hline \end{array} \quad \begin{array}{r} 8 \\ - 1 \\ \hline \end{array} \quad \begin{array}{r} 15 \\ - 8 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ - 2 \\ \hline \end{array} \quad \begin{array}{r} 8 \\ - 5 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ - 1 \\ \hline \end{array} \quad \begin{array}{r} 8 \\ - 5 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ - 3 \\ \hline \end{array} \quad \begin{array}{r} 12 \\ - 8 \\ \hline \end{array} \quad \begin{array}{r} 10 \\ - 6 \\ \hline \end{array} \quad \begin{array}{r} 15 \\ - 9 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ - 1 \\ \hline \end{array} \quad \begin{array}{r} 16 \\ - 7 \\ \hline \end{array} \quad \begin{array}{r} 8 \\ - 7 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ - 1 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ - 5 \\ \hline \end{array} \quad \begin{array}{r} 2 \\ - 0 \\ \hline \end{array} \quad \begin{array}{r} 16 \\ - 8 \\ \hline \end{array} \quad \begin{array}{r} 11 \\ - 2 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ - 0 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ - 2 \\ \hline \end{array} \quad \begin{array}{r} 6 \\ - 3 \\ \hline \end{array} \quad \begin{array}{r} 6 \\ - 2 \\ \hline \end{array} \quad \begin{array}{r} 12 \\ - 5 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ - 1 \\ \hline \end{array} \quad \begin{array}{r} 6 \\ - 5 \\ \hline \end{array} \quad \begin{array}{r} 6 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 10 \\ - 5 \\ \hline \end{array} \quad \begin{array}{r} 12 \\ - 9 \\ \hline \end{array} \quad \begin{array}{r} 9 \\ - 8 \\ \hline \end{array} \quad \begin{array}{r} 17 \\ - 8 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ - 3 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ - 7 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ - 3 \\ \hline \end{array} \quad \begin{array}{r} 14 \\ - 7 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ - 0 \\ \hline \end{array} \quad \begin{array}{r} 16 \\ - 8 \\ \hline \end{array} \quad \begin{array}{r} 8 \\ - 5 \\ \hline \end{array} \quad \begin{array}{r} 10 \\ - 2 \\ \hline \end{array} \quad \begin{array}{r} 15 \\ - 8 \\ \hline \end{array} \quad \begin{array}{r} 12 \\ - 4 \\ \hline \end{array} \quad \begin{array}{r} 14 \\ - 5 \\ \hline \end{array} \quad \begin{array}{r} 8 \\ - 7 \\ \hline \end{array}$$

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Appendix II

On a scale from one (1) to ten (10) with (1) being, “I strongly did not believe” and (10) being “I strongly felt”, to what extent did you believe that you had earned the monetary reward presented to you?

1 — 2 — 3 — 4 — 5 — 6 — 7 — 8 — 9 — 10

On a scale from one (1) to ten (10) with (1) being, “I strongly did not believe” and (10) being “I strongly felt”, to what extent did you believe that the money you were given was an unexpected bonus to the study?

1 — 2 — 3 — 4 — 5 — 6 — 7 — 8 — 9 — 10

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