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Appendix for
"Risk, Ambiguity, and Diversification"

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A List of Academic Majors

Majors that are Math-intensive or intensive in formal logic: Aerospace Engineering; Applied Math; Astrophysics; Biochemistry; Business Economics; Chemical Engineering; Chemistry; Computer Science; Economics; Electrical Engineering; Engineering; Math; Mechanical Engineering; Physics; Statistics.

Majors that are neither Math-intensive nor intensive in formal logic: Anthropology; Applied Linguistics; Asian American Studies; Biology; Chinese; Classical Civilization; English; Gender Studies; Geography; History; Human Biology & Society; International Development Studies; Linguistics; Microbiology, Immunology & Molecular Genetics; Molecular, Cell & Developmental Biology; Neuroscience; Nursing; Physiological Sciences; Political Science; Psychobiology; Psychology; Sociology; Theater; Undecided.

B Theories that Predict No Diversification in the Second Stage

As I discuss in Section 3, the major models of ambiguity aversion predict that the DM will switch lotteries in the First Stage of either condition and choose the Alternative Lottery again in the Second Stage. In this appendix I discuss the predictions for the First and Second Stages made by Subjective Expected Utility (Savage 1954), Knightian Decision Theory (Bewley 2002), Reference-Dependent Subjective Expected Utility (Sugden 2003; Kőszegi and Rabin 2006, 2007), Prospect Theory (Kahneman and Tversky 1979), and Regret Theory (Bell 1982; Loomes and Sugden 1982). In particular, I show that these theories predict that the DM will not diversify in the Second Stage of either condition.

Subjective Expected Utility

First, consider the DM's behavior in the RISK condition. The utilities of the lotteries from the First Stage are

$$\begin{aligned} U_{SEU}(Original) &= w + 0.5x \\ U_{SEU}(Alternative) &= w + 0.51x. \end{aligned}$$

Because the Alternative Lottery strictly dominates the Original Lottery, the DM switches lotteries in the First Stage. Then, in the Second Stage the DM chooses between the Alternative Lottery and the Diversified Lottery. The utility of the Diversified Lottery is

$$U_{SEU}(Diversified) = w + 0.5x.$$

Since the Alternative Lottery strictly dominates the Diversified Lottery, the DM chooses the Alternative Lottery again.

Now consider the DM's behavior in the AMBIGUITY condition. Because the DM is bayesian and knows that $Q_o, Q_a \sim U[0,1]$, she proceeds *as if* $Q_o = Q_a = 0.5$. Hence, the DM's behavior in the First and Second Stages is the same as in the RISK condition.

Knightian Decision Theory

In the RISK condition the DM behaves as a subjective expected utility maximizer, but in the AMBIGUITY condition she behaves differently. Unlike a bayesian DM, a Knightian DM has *multiple beliefs* about actual probabilities (Q_o, Q_a). Let B denote such set of beliefs. In particular, because the DM knows that Q_o and Q_a could take on any values in the $[0,1]$ interval, $B = [0,1] \times [0,1]$. Given a belief $(q_o, q_a) \in B$, the utilities of the lotteries from the First Stage are

$$\begin{aligned} U_{KDT}(Original) &= w + q_o\, x \\ U_{KDT}(Alternative) &= w + 0.01x + q_a\, x. \end{aligned}$$

The DM prefers the Original Lottery if and only if

$$U_{KDT}(Original) \geq U_{KDT}(Alternative) \quad \text{for } \textit{all } (q_o, q_a) \in B.$$

Conversely, she prefers the Alternative Lottery if and only if

$$U_{KDT}(Original) \leq U_{KDT}(Alternative) \quad \text{for } all \ (q_o, q_a) \in B.$$

Clearly, neither of the above inequalities holds for *all* $(q_o, q_a) \in B$; this means that the DM finds the lotteries incomparable. I shall say that the DM is *indecisive*. How does an indecisive DM make a choice? To predict choice behavior, Bewley (2002) invoked the *Inertia Assumption*. Bewley considered situations in which the DM makes an initial plan to pick a certain option, and later on an alternative that was previously unavailable and whose arrival was unexpected becomes feasible. The initial plan becomes the status quo option. The Inertia Assumption states that the DM will switch to the alternative option *only if* the alternative option is *strictly preferred* to the status quo. This implies that if the DM is indecisive, she will stick with the status quo option. Because the Alternative Lottery becomes available by surprise, there is a unique initial plan—playing the Original Lottery. Thus, Knightian Decision Theory predicts that the DM will not switch lotteries in the First Stage.

In the Second Stage, the Diversified Lottery becomes available by surprise. The DM chooses between the Original Lottery—the status quo option—and the Diversified Lottery. Given a belief $(q_o, q_a) \in B$, the utility of the Diversified Lottery is

$$U_{KDT}(Diversified) = w + 0.5(q_o + q_a)x.$$

Again, the DM will be indecisive between the lotteries. Hence, she will continue to stick with the Original Lottery.

Reference-Dependent Subjective Expected Utility

This theory encompasses three different models: Sugden's (2003), Kőszegi and Rabin's (2006, 2007), and a model with initial wealth as the reference point—which is a special case of Prospect Theory (Kahneman and Tversky 1979).

Sugden's (2003) Model

In each stage, the reference point is the lottery with which the DM is endowed. Clearly, in the First Stage the reference point is the Original Lottery. When the DM evaluates an outcome from the Original Lottery, the reference level is that same outcome; hence the outcome yields no gain-loss utility. On the other hand, when the DM evaluates an outcome from the Alternative Lottery, its gain-loss utility is the average of how it feels relative to each possible realization of the Original Lottery.[1]

Consider the DM's behavior in the RISK condition. The utilities of the lotteries from the First Stage are

$$\begin{aligned} U_S(Original) &= w + 0.5x \\ U_S(Alternative) &= w + 0.51x + \{0.5\ [0.5\ \mu(1.01x - 0) + 0.5\ \mu(1.01x - x)] \\ &\quad +0.5\ [0.5\ \mu(0.01x - 0) + 0.5\ \mu(0.01x - x)]\}. \end{aligned}$$

Assuming that $\mu(.)$ is piecewise-linear as in (4), we conclude that the DM chooses the Original Lottery in the First Stage if and only if $\lambda > 1.08$. Suppose that the DM chooses the Original Lottery. Then, in the Second Stage the DM chooses between the Original Lottery and the Diversified Lottery. The reference point continues to be the Original Lottery. The utility of the Diversified Lottery is

$$\begin{aligned} U_S(Diversified) &= w + 0.5x + [0.25\ \mu(x - x) + 0.25\ \mu(0.5x - 0) \\ &\quad +0.25\ \mu(0.5x - x) + 0.25\ \mu(0 - 0)]. \end{aligned}$$

A payoff of x or a payoff of 0 do not generate gain-loss utility, as in either case the outcome would have been the same had the DM played the Original Lottery. By contrast, a payoff of $0.5x$ creates either a gain (second term between brackets) or a loss (third term between brackets) relative to the Original Lottery. If the only successful roll is the one from the alternative die, the DM experiences a gain of $0.5x$ because she would have obtained nothing had she played the Original Lottery. On the other hand, if the only successful roll is the one from the original die, the DM experiences a loss of $0.5x$ because she would have obtained the full prize x had she played the Original Lottery. Since the DM is loss-averse, the disutility from the loss outweighs the utility from the gain (this means that the sum of the four terms between brackets

[1] Recall that the DM does not get to know the outcome of the Original Lottery when she chooses the Alternative Lottery (because in this case the Original Lottery is not resolved). Then, an outcome from the Alternative Lottery does not have a fixed reference level. This is why the DM compares such outcome to each possible realization of the Original Lottery. In the original setting of Sugden's (2003) model, the DM does learn the outcomes of all lotteries. In that setting, the gain-loss utility of an outcome from the Alternative Lottery is how it feels relative to the outcome of the Original Lottery.

is negative); hence, loss aversion implies that the DM strictly prefers the Original Lottery to the Diversified Lottery.[2]

Now consider the DM's behavior in the AMBIGUITY condition. Since the DM is bayesian and knows that $Q_o, Q_a \sim U[0,1]$, she proceeds *as if* $Q_o = Q_a = 0.5$. This implies that all the subjective probability distributions and the reference point remain the same as in the RISK condition. Therefore, the DM's behavior in the First and Second Stages is the same as in RISK.

Kőszegi and Rabin's (2006, 2007) Model

In each stage, the reference point is the lottery that the DM planned to play originally—that is, before the new option becomes available. The gain-loss utility of an outcome is the average of how it feels relative to each possible realization of the reference lottery.

First, consider the DM's behavior in the RISK condition. Because the option to switch lotteries in the First Stage is a surprise, the DM expects to play the Original Lottery until the moment of the keep-or-switch decision. Thus, the reference point in the First Stage is the Original Lottery. The utilities of the lotteries from the First Stage are

$$
\begin{aligned}
U_{KR}(Original) &= w + 0.5x + \{0.5\ [0.5\ \mu(x-0) + 0.5\ \mu(x-x)] \\
&\quad +0.5\ [0.5\ \mu(0-0) + 0.5\ \mu(0-x)]\} \\
U_{KR}(Alternative) &= w + 0.51x + \{0.5\ [0.5\ \mu(1.01x-0) + 0.5\ \mu(1.01x-x)] \\
&\quad +0.5\ [0.5\ \mu(0.01x-0) + 0.5\ \mu(0.01x-x)]\}.
\end{aligned}
$$

[2] If the DM were to choose the Alternative Lottery instead of the Original Lottery in the First Stage, she would still not diversify in the Second Stage. The reference point in the Second Stage would be the Alternative Lottery. The utility of the Alternative Lottery would be

$$U_S(Alternative|Second\ Stage) = w + 0.51x$$

and the utility of the Diversified Lottery would be

$$
\begin{aligned}
U_S(Diversified) &= w + 0.5x \\
&\quad +[0.25\ \mu(x-1.01x) + 0.25\ \mu(0.5x-0.01x) \\
&\quad +0.25\ \mu(0.5x-1.01x) + 0.25\ \mu(0-0.01x)].
\end{aligned}
$$

It is clear that the Alternative Lottery strictly dominates the Diversified Lottery for any degree of loss aversion.

Since the Alternative Lottery strictly dominates the Original Lottery, the DM switches lotteries. Then, in the Second Stage the DM chooses between the Alternative Lottery and the Diversified Lottery. Because the opportunity to diversify is a surprise to the DM, at the moment of making the Second-Stage choice the DM expects to play the Alternative Lottery. Thus, the reference point is the Alternative Lottery. The utilities of the lotteries from the Second Stage are

$$\begin{aligned}
U_{KR}(Alternative|Second\ Stage) &= w + 0.51x \\
&\quad +\{0.5\ [0.5\ \mu(1.01x - 0.01x) + 0.5\ \mu(1.01x - 1.01x)] \\
&\quad +0.5\ [0.5\ \mu(0.01x - 0.01x) + 0.5\ \mu(0.01x - 1.01x)]\} \\
U_{KR}(Diversified) &= w + 0.5x \\
&\quad +\{0.25\ [0.5\ \mu(x - 0.01x) + 0.5\ \mu(x - 1.01x)] \\
&\quad +0.5\ [0.5\ \mu(0.5x - 0.01x) + 0.5\ \mu(0.5x - 1.01x)] \\
&\quad +0.25\ [0.5\ \mu(-0.01x) + 0.5\ \mu(-1.01x)]\}.
\end{aligned}$$

To determine whether the DM diversifies in the Second Stage, assume that μ is piecewise-linear as in (4). It turns out that the Alternative Lottery strictly dominates the Diversified Lottery for any degree of loss aversion. As the DM expected to play the Alternative Lottery, she is still willing to bear the risk even after learning that she can diversify.[3]

Now consider the DM's behavior in the AMBIGUITY condition. Because the DM is bayesian and knows that $Q_o, Q_a \sim U[0,1]$, she proceeds *as if* $Q_o = Q_a = 0.5$. This implies that all the subjective probability distributions and reference points remain the same as in the RISK condition. Hence, the DM's behavior in the First and Second Stages is the same as in RISK.

A Model with Initial Wealth as the Reference Point

The reference level to which any outcome is compared is initial wealth w. First, consider the DM's behavior in the RISK condition. The utilities of the lotteries from

[3] Compare to a situation in which the DM expected to play the Diversified Lottery and is surprised with the option to switch to the Alternative Lottery. In this case, the reference point is the Diversified Lottery. Now the DM chooses the Alternative Lottery if and only if $\lambda \leq 1.34$. The comparison between the two situations reveals an *endowment effect for risk* (Kőszegi and Rabin 2007, pp. 1053-1054): the DM is more likely to choose the Alternative Lottery (instead of the Diversified Lottery) when she expected to play it than when the option to play it is a surprise.

the First Stage are

$$\begin{aligned}
U_W(Original) &= w + 0.5x + [0.5\ \mu(x-0) + 0.5\ \mu(0-0)] \\
U_W(Alternative) &= w + 0.51x + [0.5\ \mu(1.01x-0) + 0.5\ \mu(0.01x-0)].
\end{aligned}$$

Since the Alternative Lottery strictly dominates the Original Lottery, the DM switches lotteries. Then, in the Second Stage the DM chooses between the Alternative Lottery and the Diversified Lottery. The utility of the Diversified Lottery is:

$$U_W(Diversified) = w + 0.5x + [0.25\ \mu(x-0) + 0.5\ \mu(0.5x-0) + 0.25\ \mu(0-0)].$$

Assuming that $\mu(.)$ is piecewise-linear as in (4), we conclude that the Alternative Lottery strictly dominates the Diversified Lottery for any degree of loss aversion.

Now consider the DM's behavior in the AMBIGUITY condition. Because the DM is bayesian and knows that $Q_o, Q_a \sim U[0,1]$, she proceeds *as if* $Q_o = Q_a = 0.5$. This implies that all the probability distributions remain the same as in the RISK condition. Hence, the DM's behavior in the First and Second Stages is the same as in RISK.[4]

Regret Theory

As in Reference-Dependent Subjective Expected Utility models, the DM has reference-dependent preferences. In each stage, when the DM evaluates a lottery, the reference point is the other available lottery.

First, consider the DM's behavior in the RISK condition. Because the lotteries from the First Stage are independent, after the chosen lottery is resolved the DM does not learn the counterfactual outcome from the rejected lottery. Hence, the gain-loss utility of an outcome in the First Stage is the average of how it feels relative to each possible outcome of the other lottery. The utilities of the lotteries from the First

[4]This model is a special case of Prospect Theory (Kahneman and Tversky 1979), which allows for non-linear probability weighting. While the prediction that the DM will switch in the First Stage of either condition remains the same under Prospect Theory, we no longer have a sharp prediction for the Second Stage; we need to make additional assumptions about the functional form of the probability weighting function in order to predict behavior. Nevertheless, because the DM is bayesian, the conclusion that her behavior is the same in both conditions still holds.

Stage are

$$\begin{aligned}
U_{RT}(Original|\ First\ Stage) &= w + 0.5x \\
&\quad +\{0.5\ [0.5\ \mu(x - 1.01x) + 0.5\ \mu(x - 0.01x)] \\
&\quad +0.5\ [0.5\ \mu(0 - 1.01x) + 0.5\ \mu(0 - 0.01x)]\} \\
U_{RT}(Alternative|\ First\ Stage) &= w + 0.51x \\
&\quad +\{0.5\ [0.5\ \mu(1.01x - x) + 0.5\ \mu(1.01x - 0)] \\
&\quad +0.5\ [0.5\ \mu(0.01x - x) + 0.5\ \mu(0.01x - 0)]\}.
\end{aligned}$$

Since the Alternative Lottery strictly dominates the Original Lottery, the DM switches lotteries. Then, in the Second Stage the DM chooses between the Alternative Lottery and the Diversified Lottery. If she chooses the Alternative Lottery, she will not learn the counterfactual outcome from the Diversified Lottery. Yet, after a win she will know that had she played the Diversified Lottery she would have obtained either $0.5x$ (with probability 0.5) or x (with probability 0.5); and after a failure to win, she will know that the counterfactual outcome would have been either 0 (with probability 0.5) or $0.5x$ (with probability 0.5). Thus, the utility of the Alternative Lottery in the Second Stage is

$$\begin{aligned}
U_{RT}(Alternative|\ Second\ Stage) &= w + 0.51x \\
&\quad +\{0.5\ [0.5\ \mu(1.01x - 0.5x) + 0.5\ \mu(1.01x - x)] \\
&\quad +0.5\ [0.5\ \mu(0.01x - 0) + 0.5\ \mu(0.01x - 0.5x)]\}.
\end{aligned}$$

On the other hand, if the DM chooses the Diversified Lottery, she will learn the counterfactual outcome from the Alternative Lottery. If she obtains x, she will know that she would have gotten $1.01x$ had she played the Alternative Lottery. If she obtains $0.5x$ as a result of a successful roll of the original die, she will know that the counterfactual payoff would have been $0.01x$. If instead she gets $0.5x$ as a result of a successful roll of the alternative die, she will know that the counterfactual payoff would have been $1.01x$. Finally, if she gets nothing, she will know that she would have gotten $0.01x$ had she played the Alternative Lottery. Thus, the utility of the

Diversified Lottery is

$$\begin{aligned}U_{RT}(Diversified) &= w + 0.5x \\ &+\{0.25\ \mu(x - 1.01x) + 0.25\ \mu(0.5x - 0.01x) \\ &+0.25\ \mu(0.5x - 1.01x) + 0.25\ \mu(0 - 0.01x)\}.\end{aligned}$$

We can see that the DM strictly prefers the Alternative Lottery to the Diversified Lottery.

Now consider the DM's behavior in the AMBIGUITY condition. Since the DM is bayesian and knows that $Q_o, Q_a \sim U[0, 1]$, she proceeds *as if* $Q_o = Q_a = 0.5$. This implies that all the subjective probability distributions remain the same as their objective counterparts from the RISK condition. Hence, the DM's behavior in the First and Second Stages is the same as in RISK.

C Predicted Choice Behavior in the Third Stage of the AMBIGUITY Condition

In this appendix I discuss the predictions of Disappointment Theory (Bell 1985; Loomes and Sugden 1986) and Krähmer and Stone's (2013) theory for the Third Stage of the AMBIGUITY condition.

Using Bayes' Rule, the DM updates her beliefs about the probability of a good draw each time a draw is performed. Let $\tilde{q}_o$ and $\tilde{q}_a$ denote the posterior subjective probabilities of a good draw from the original and alternative bags after the practice draws. A disappointment-averse DM evaluates the lotteries as follows:

$$\begin{aligned}U_{DT}(Original) &= w + \tilde{q}_o\ x + [\tilde{q}_o\ \mu(x - \tilde{q}_o\ x) + (1 - \tilde{q}_o)\ \mu(0 - \tilde{q}_o\ x)] \\ U_{DT}(Alternative) &= w + 0.01x + \tilde{q}_a\ x \\ &+[\tilde{q}_a\ \mu(1.01x - 0.01x - \tilde{q}_a\ x) + (1 - \tilde{q}_a)\ \mu(0.01x - 0.01x - \tilde{q}_a\ x)] \\ U_{DT}(Diversified) &= w + (\tilde{q}_o + \tilde{q}_a)(0.5x) + [\tilde{q}_o\tilde{q}_a\ \mu(x - 0.5\ (\tilde{q}_o + \tilde{q}_a)\ x) \\ &+(\tilde{q}_o(1 - \tilde{q}_a) + (1 - \tilde{q}_o)\tilde{q}_a)\ \mu(0.5x - 0.5\ (\tilde{q}_o + \tilde{q}_a)\ x) \\ &+(1 - \tilde{q}_o)(1 - \tilde{q}_a)\ \mu(0 - 0.5\ (\tilde{q}_o + \tilde{q}_a)\ x)].\end{aligned}$$

After a good practice draw from bag i ($i = Original,\ Alternative$), $\tilde{q}_i = 0.625$;

and after a bad draw, $\tilde{q}_i = 0.375$. To determine when the DM chooses the Diversified Lottery, assume that μ is piecewise-linear (see expression (4) from the main text). The DM diversifies if and only if $\lambda > \tilde{\lambda}_{DT}$, where

$$\tilde{\lambda}_{DT} = \begin{cases} 1.11 & if\ scenario = \text{`}good\ draw - good\ draw\text{'} \\ 1.11 & if\ scenario = \text{`}bad\ draw - bad\ draw\text{'} \\ 2.07 & if\ scenario = \text{`}good\ draw - bad\ draw\text{'} \\ 2.15 & if\ scenario = \text{`}bad\ draw - good\ draw\text{'} \end{cases}.$$

Now consider the behavior of a Krähmer-Stone DM. It is important to note that after an *actual* draw, the DM updates her beliefs $\tilde{q}_o$ and $\tilde{q}_a$ once again, and these updated beliefs affect the reference levels. Below I discuss behavior in each scenario separately.

(i) 'good draw-good draw' scenario

After the practice draws but before the actual draws, $\tilde{q}_o = \tilde{q}_a = 0.625$. After a good actual draw from bag i, $\tilde{q}_i$ is updated to 0.7; after a bad actual draw, $\tilde{q}_i$ is updated to 0.5. Thus, the utilities of the lotteries are

$$\begin{aligned} U_{KS}(Original) &= w + 0.625x + [0.625\ \mu(x - 0.7x) + 0.375\ \mu(0 - 0.01x - 0.625x)] \\ U_{KS}(Alternative) &= w + 0.01x + 0.625x \\ &\quad +[0.625\ \mu(1.01x - 0.01x - 0.7x) + 0.375\ \mu(0.01x - 0.625x)] \\ U_{KS}(Diversified) &= w + 0.625x + [(0.625)^2\ \mu(x - 0.01x - 0.7x) \\ &\quad +(0.625 * 0.375)\ \mu(0.5x - 0.7x) \\ &\quad +(0.375 * 0.625)\ \mu(0.5x - 0.01x - 0.7x) \\ &\quad +(0.375)^2\ \mu(0 - 0.01x - 0.5x)]. \end{aligned}$$

The Alternative Lottery strictly dominates the Original one. Using expression (4) from the main text, we obtain that the DM chooses the Diversified Lottery over the Alternative Lottery if and only if $\lambda > 1.34$.

(ii) 'bad draw-bad draw' scenario

After the practice draws but before the actual draws, $\tilde{q}_o = \tilde{q}_a = 0.375$. After a good actual draw from bag i, $\tilde{q}_i$ is updated to 0.5; after a bad actual draw, $\tilde{q}_i$ is updated to 0.3. Thus, the utilities of the lotteries are

$$\begin{aligned}
U_{KS}(Original) &= w + 0.375x + [0.375\ \mu(x - 0.5x) + 0.625\ \mu(0 - 0.01x - 0.375x)] \\
U_{KS}(Alternative) &= w + 0.01x + 0.375x \\
&\quad +[0.375\ \mu(1.01x - 0.01x - 0.5x) + 0.625\ \mu(0.01x - 0.375x)] \\
U_{KS}(Diversified) &= w + 0.375x + [(0.375)^2\ \mu(x - 0.01x - 0.5x) \\
&\quad +(0.375 * 0.625)\ \mu(0.5x - 0.5x) \\
&\quad +(0.625 * 0.375)\ \mu(0.5x - 0.01x - 0.5x) \\
&\quad +(0.625)^2\ \mu(0 - 0.01x - 0.3x)].
\end{aligned}$$

The Alternative Lottery strictly dominates the Original one. Using expression (4) from the main text, we conclude that the DM chooses the Diversified Lottery over the Alternative Lottery if and only if $\lambda > 1.23$.

(iii) 'good draw-bad draw' scenario

After the practice draws but before the actual draws, $\tilde{q}_o = 0.625$ and $\tilde{q}_a = 0.375$. After a good actual draw from the original bag, $\tilde{q}_o$ is updated to 0.7; after a bad actual draw, $\tilde{q}_o$ is updated to 0.5. On the other hand, after a good actual draw from the alternative bag, $\tilde{q}_a$ is updated to 0.5; after a bad actual draw, $\tilde{q}_a$ is updated to 0.3. Thus, the utilities of the lotteries are

$$\begin{aligned}
U_{KS}(Original) &= w + 0.625x + [0.625\ \mu(x - 0.7x) + 0.375\ \mu(0 - 0.5x)] \\
U_{KS}(Alternative) &= w + 0.01x + 0.375x \\
&\quad +[0.375\ \mu(1.01x - 0.625x) + 0.625\ \mu(0.01x - 0.625x)] \\
U_{KS}(Diversified) &= w + 0.5x + [(0.625 * 0.375)\ \mu(x - 0.7x) \\
&\quad +(0.625)^2\ \mu(0.5x - 0.7x) + (0.375)^2\ \mu(0.5x - 0.51x) \\
&\quad +(0.375 * 0.625)\ \mu(0 - 0.5x)].
\end{aligned}$$

Using expression (4) again, we obtain that the DM strictly prefers the Original Lottery regardless of her degree of loss aversion.

(iv) 'bad draw-good draw' scenario

After the practice draws but before the actual draws, $\tilde{q}_o = 0.375$ and $\tilde{q}_a = 0.625$. After a good actual draw from the original bag, $\tilde{q}_o$ is updated to 0.5; after a bad actual draw, $\tilde{q}_o$ is updated to 0.3. On the other hand, after a good actual draw from the alternative bag, $\tilde{q}_a$ is updated to 0.7; after a bad actual draw, $\tilde{q}_a$ is updated to 0.5. Thus, the utilities of the lotteries are

$$\begin{aligned}
U_{KS}(Original) &= w + 0.375x \\
&\quad +[0.375\ \mu(x - 0.01x - 0.625x) + 0.625\ \mu(0 - 0.01x - 0.625x)] \\
U_{KS}(Alternative) &= w + 0.01x + 0.625x \\
&\quad +[0.625\ \mu(1.01x - 0.01x - 0.7x) \\
&\quad +0.375\ \mu(0.01x - 0.01x - 0.5x)] \\
U_{KS}(Diversified) &= w + 0.5x + [(0.375 * 0.625)\ \mu(x - 0.01x - 0.7x) \\
&\quad +(0.375)^2\ \mu(0.5x - 0.01x - 0.5x) \\
&\quad +(0.625)^2\ \mu(0.5x - 0.01x - 0.7x) \\
&\quad +(0.625 * 0.375)\ \mu(0 - 0.01x - 0.5x)].
\end{aligned}$$

Using expression (4) once again, we conclude that the DM strictly prefers the Alternative Lottery regardless of her degree of loss aversion.

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Appendix Tables

In Appendix Tables A1 and A2 I compare demographic characteristics of participants between the present experiment and the experiment I reported in Sautua (2016). In Appendix Table A1 I compare the RISK condition to its counterpart from the previous experiment; similarly, in Appendix Table A2 I compare the AMBIGUITY condition to its counterpart from the previous experiment. For each condition in a given experiment, the tables show the percentage of participants who previously participated in other experiments (at any lab on campus and at the Anderson Behavioral Lab in particular), are women, are Asian, are undergraduate students, pursue an academic major that is Math-intensive or intensive in formal logic, and are native English speakers. For each of these observable characteristics, the last column of each table displays the result of a chi-square test of differences in proportions across experiments. Participants are clearly balanced on observable characteristics. (There is only one statistically significant difference: the proportion of participants from AMBIGUITY who are undergraduates is larger than in the previous experiment.)

Table A1

Demographic Characteristics of Participants from Conditions with Risky Lotteries

Variable	Experiment Current (N = 51)	Experiment Previous (N = 49)	Chi-Square Test p-value*
Other Experiments	82%	84%	0.860
Anderson Lab	75%	73%	0.906
Female	75%	82%	0.390
Asian	47%	61%	0.155
Undergraduate	94%	94%	0.960
Math-Related Major	37%	31%	0.483
English 1st Language	80%	67%	0.137

* The p-values are for chi-square tests of differences in proportions. For each variable, the null hypothesis is that the percentage of participants with the relevant characteristic is the same in both experiments.

Table A2

Demographic Characteristics of Participants from Conditions with Ambiguous Lotteries

Variable	Experiment Current (N = 49)	Experiment Previous (N = 49)	Chi-Square Test p-value*
Other Experiments	81%	84%	0.754
Anderson Lab	73%	71%	0.870
Female	72%	73%	0.901
Asian	44%	43%	0.929
Undergraduate	94%	71%	0.004
Math-Related Major	35%	24%	0.240
English 1st Language	83%	82%	0.826

* The p-values are for chi-square tests of differences in proportions. For each variable, the null hypothesis is that the percentage of participants with the relevant characteristic is the same in both experiments.

Table A3
Inertia in the Third Stage, by Condition and Combination of First- and Second-Stage Choices

Panel A: RISK Condition

	Choice Third Stage = Choice Second Stage				Choice Third Stage ≠ Choice Second Stage		
	Diversified Lottery	Previous Choice	Total		Diversified Lottery	Previous Choice	Total
Original	7	3	10	Original	6	8	14
Alternative	7	1	8	Alternative	9	10	19
Total	14	4	18	Total	15	18	33

Panel B: AMBIGUITY Condition

	Choice Third Stage = Choice Second Stage				Choice Third Stage ≠ Choice Second Stage		
	Diversified Lottery	Previous Choice	Total		Diversified Lottery	Previous Choice	Total
Original	15	6	21	Original	5	4	9
Alternative	12	4	16	Alternative	2	1	3
Total	27	10	37	Total	7	5	12

Notes: choice behavior in the Third Stage is restricted to the '60-40' and '40-60' scenarios (RISK condition) and the 'good-draw-bad draw' and 'bad draw-good draw' scenarios (AMBIGUITY condition). A participant is classified as having made the same choice in the Third Stage as in the Second Stage if she repeated her Second-Stage choice in both Third-Stage scenarios.

APPENDIX, SECTION D: EXPERIMENTAL PROCEDURES, INSTRUCTIONS, AND FORMS

RISK CONDITION

Procedures

- Participants are recruited using the Anderson Lab's online recruitment system.

- Participants enter the room, are seated at an individual desk, and are asked to sign the Consent Form to participate in the study.

- Once they have agreed to participate in the study, they are assigned a Participant ID Number.

- Participants are given a handout with General Instructions and Specific Instructions #1. The experimenter reads these instructions aloud.

- Participants are given a handout with Specific Instructions #2. These instructions introduce the Original Lottery. The experimenter reads the instructions aloud.

- Once the experimenter finishes reading Specific Instructions #2, the assistants leave the main room and go to two separate rooms next door. They stay there until the end of the session.

- Participants fill out a questionnaire about personal information and a personality questionnaire.

- Participants receive a handout with Specific Instructions #3. These instructions remind them of the Original Lottery. The experimenter reads these instructions aloud.

- Participants receive Decision Form #1. At this time, they are informed that they have the opportunity to switch dice and receive a $0.10 bonus, if they so desire. They make a keep-or-switch decision.

- Participants receive a handout with Specific Instructions #4. These instructions introduce the Diversified Lottery. Then, participants indicate whether or not they want to diversify on Decision Form #2.

- Participants receive a handout with Specific Instructions #5 and choose four sets of numbers.

- Then, they receive a handout with Specific Instructions #6. These instructions introduce the Third-Stage scenarios. The experimenter reads the instructions aloud.

- Participants receive Decision Form #3 and indicate their choice for each Third-Stage scenario.

- One of the scenarios is randomly chosen to be played out. Each participant plays the chosen lottery in a room next door.

General Instructions

Welcome to this session. Thanks for coming.

This session will take 40-45 minutes. You will receive an $8 minimum payment if you complete the study. These $8 are yours. In the session you will have the chance to earn additional money. Whatever you earn from the study today will be added to this minimum payment. All payments will be made with Bruincard deposits in the next few weeks.

During this short study, you will be asked to fill out some questionnaires and you will play an individual lottery that involves real money.

Your questionnaire responses as well as the lottery outcome will be kept strictly confidential. At your desk, you will find a sticker with your Participant ID Number. Please write down this number on the front page of each of the forms that you fill out.

Before we begin, we ask you to respect the following guidelines:

- No talking is allowed. If you have any questions during the study, please raise your hand. I will come to your place and answer your question privately.

- Every participant's task is individual and should be completed in private. Do not look at what other participants are doing.

If you do not comply with these rules, we will be forced to exclude you from the study. Thank you for your cooperation.

Should you have any questions or concerns at this point, please raise your hand. Otherwise, we will move on to the specific instructions.

Specific Instructions #1

- On your desk you can find two empty envelopes and two blank cards. One of the envelopes is labeled “NUMBERS” and the other is labeled “DIE.” Feel free to inspect the envelopes and the cards.
- Now, please pick five different numbers between 0 (inclusive) and 9 (inclusive).
  - Notice that you have to choose five out of ten possible numbers.
  - Write down the numbers you picked, separated by commas, on one of the cards.
  - Place the card inside the envelope labeled “NUMBERS” and close the envelope.
- Then, please pick a die—DIE 1 or DIE 2.
  - Write down the die you picked on the other card.
  - Place the card inside the envelope labeled “DIE” and close the envelope.

Next, I will explain to you what we will use the cards for.

Specific Instructions #2

- Two assistants will help us today. They will do the same things but will proceed independently to help us run the session smoothly. So roughly half of you will interact with one of the assistants, and the other half will interact with the other assistant.

- These plastic cups contain several 10-sided dice. Each die has numbers 0 through 9. Please pass the cups along and pick one die. Feel free to inspect the die.

- Now, we will collect the dice.

- Each assistant will randomly pick two dice and two transparent plastic cups from the pile you see on the front desk. Each assistant will place one die inside each cup.

- At the end of the session, the assistants will go to a room next door. Each assistant will label one of the dice "DIE 1" and the other die "DIE 2." (To this end, she will use stickers like the ones that display your Participant ID # on your desk.)

- One of the assistants will call you individually. Once you are inside the room, she will roll <u>one</u> of the two dice in front of you. She will use the transparent plastic cup to roll the die.

- You will use the cards to play an <u>individual</u> lottery. Together, the cards are a ticket to play the lottery.

    - If you picked DIE 1, the assistant will roll DIE 1. If you picked DIE 2, the assistant will roll DIE 2.

    - If any of the five numbers that you picked comes up, you will get $10.

    - If any of the remaining five numbers comes up, you will get $0.

- Please note that the lottery is real. You will actually receive $10 if you happen to win the prize.

- At the end of the session, you will line up in the hallway. One of the assistants will call you individually.

    - First, she will open the envelope labeled "DIE" to find out which die she has to roll.

    - Then, she will roll the corresponding die in front of you.

    - After rolling the die, she will open the envelope labeled "NUMBERS" to check whether you won the prize.

- Because the assistant will find out which numbers you picked only after rolling the die, you can be assured that this is a fair lottery.

Should you have any questions now, please raise your hand, and I will come by your desk. Otherwise, we will proceed with the study.

Next, you will provide some personal information and fill out a personality questionnaire.

Participant ID Number: ____

Personal Information

All responses will be kept strictly confidential.

(1) Have you participated in other studies conducted in a lab on campus? If yes, please indicate which labs you have been to.

(2) What is your age?

(3) What is your gender? Male ____ Female ____

(4) What is your racial or ethnic background?

White or Caucasian ____ Black or African American ____ Hispanic ____
Asian ____ Native American ____ Multiracial ____ Other ____

(5) What is your major? If you have one, please specify it. If not, indicate "undecided".

(6) What year are you classified for in the current semester?

Freshman ____ Sophomore ____ Junior ____ Senior _____
Masters student ____ Doctoral student ____

(7) Please indicate the country where you were raised.

(8) What is your native language?

Participant ID Number: ____

Questionnaire: How I am in General

Here are a number of characteristics that may or may not apply to you. For each statement in the table, please indicate the extent to which you agree or disagree with that statement, by checking the appropriate column.

All responses will be kept strictly confidential.

I am someone who…	*Strongly Disagree*	*Disagree*	*Neither Agree Nor Disagree*	*Agree*	*Strongly Agree*
Is talkative					
Tends to find fault with others					
Does a thorough job					
Is depressed					
Is original, comes up with new ideas					
Is reserved					
Is helpful and unselfish with others					
Can be somewhat careless					
Is relaxed, handles stress well					
Is curious about many different things					
Is full of energy					
Starts quarrels with others					
Is a reliable worker					
Can be tense					
Is ingenious, a deep thinker					
Generates a lot of enthusiasm					
Has a forgiving nature					
Tends to be disorganized					
Worries a lot					
Has an active imagination					
Tends to be quiet					
Is generally trusting					

Once you are done, please raise your hand. I will come by your desk and give you another booklet.

Specific Instructions #3

Thank you for completing the previous questionnaires.

- Recall that you have a ticket to play an individual lottery that offers a $10 prize.
- The assistant will roll the corresponding die in front of you.
    - You will win the prize if any of the five numbers that you picked comes up.
    - You will get nothing if any of the remaining five numbers comes up.
- After rolling the die, the assistant will check your ticket and will record the outcome of the lottery.

Should you have any questions now, please raise your hand, and I will come by your desk. Otherwise, we will proceed with the study.

Now, you can go ahead and complete the following form.

Participant ID Number: ____

Decision Form #1

You have the opportunity to switch dice, if you so desire.

If you switch dice, you will receive $0.10 in addition to what you get from the lottery.

Please indicate your decision below (and fill in the blank between brackets next to the corresponding option):

______ *I want to KEEP the original die [i.e., DIE ____]*

______ *I want to SWITCH to the alternative die [i.e., DIE ____]*

Your decision will be kept strictly confidential.

Should you have any questions before making the decision, please raise your hand and I will come by your desk.

Please raise your hand once you are done.

Specific Instructions #4

You now have the opportunity to either play this lottery or play another lottery that I will describe next.

- If you decide to play this lottery, everything will happen as described before.
    - The assistant will roll the <u>die you chose</u> on Decision Form #1, and you will get $10 if any of the five numbers from your ticket comes up.
    - Also, if you chose to switch dice on Decision Form #1, you will get $0.10 in addition to what you get from the lottery.
- If instead you decide to play the other lottery, the assistant will roll <u>both dice</u> in front of you. The lottery works as follows:
    - First, the assistant will roll DIE 1. If any of the five numbers that you picked comes up, you will get $5 from this roll. If any of the remaining five numbers comes up, you will get $0 from this roll.
    - Then, the assistant will roll DIE 2. If any of the five numbers that you picked comes up, you will get $5 from the second roll. Otherwise, you will get $0 from the second roll.
- To sum up, if you play the lottery in which both dice are rolled, you will get:
    - $10 in total if <u>both</u> rolls are successful;
    - $5 in total if only <u>one</u> roll is successful;
    - $0 if <u>neither</u> of the rolls is successful.
- Notice that the lottery in which both dice are rolled does not pay the $0.10 bonus.

Now you can go ahead and complete the following form.

Participant ID Number: ____

Decision Form #2

Please indicate your decision below (and fill in the blank between brackets next to the corresponding option):

______ *I want to play the lottery in which only <u>the die I chose</u> on Decision Form #1 is rolled. [On Decision Form #1, I chose DIE ___]*

______ *I want to play the lottery in which <u>both dice</u> are rolled*

Your decision will be kept strictly confidential.

Should you have any questions before making the decision, please raise your hand and I will come by your desk.

Please raise your hand once you are done.

Specific Instructions #5

- Now, please grab the card from the envelope labeled "NUMBERS."
- You will write four sets of numbers on the back side of the card, each on a separate line.
- First, <u>drop</u> one of the five numbers that you picked originally. Please write down "-1:" and the <u>four final numbers</u> next to it.
- Next, <u>drop</u> one more number. Please write down "-2:" and the <u>three final numbers</u> next to it.
- Now, <u>add</u> one number to the five numbers that you picked originally. Please write down "+1:" and the <u>six final numbers</u> next to it.
- Finally, <u>add</u> one more number. Please write down "+2:" and the <u>seven final numbers</u> next to it.
- Once you are done, please put the card back into the envelope.

Specific Instructions #6

In a moment you will fill out the last form.

- So far, you have faced the following scenario:

  Scenario #1:

  - A roll of DIE 1 is successful if any of the five numbers that you picked originally comes up.

  - A roll of DIE 2 is successful if any of the five numbers that you picked originally comes up.

  On Decision Form #2, you chose between (i) a lottery in which only one die is rolled (which pays $10 if the roll is successful), and (ii) a lottery in which both dice are rolled (which pays $5 if only one roll is successful and $10 if both rolls are successful).

- Now, you will make the same choice in four additional scenarios (Scenarios #2 through #5). Like in Scenario #1, the sets of numbers that you wrote on the card will determine whether a roll of a given die is successful. The following table summarizes all scenarios:

Scenario	Roll of DIE 1 successful if …	Roll of DIE 2 successful if …
#1	any of five original numbers comes up	any of five original numbers comes up
#2	any of four final numbers comes up	any of six final numbers comes up
#3	any of six final numbers comes up	any of four final numbers comes up
#4	any of three final numbers comes up	any of seven final numbers comes up
#5	any of seven final numbers comes up	any of three final numbers comes up

- In each scenario, you will choose one of three options:

  - play the lottery in which DIE 1 is rolled;

  - play the lottery in which DIE 2 is rolled;

  - play the lottery in which both dice are rolled.

- You will get the $0.10 bonus if (i) you choose a lottery in which a single die is rolled, and (ii) this die is not the one that you wrote on the card originally.

- You will make a choice for each scenario. (You already made a choice for Scenario #1.) However, only one scenario will count after you have made your choices.

    - To determine the scenario-that-counts, we will come by your desk once you have made you choices, and you will draw a piece of paper from a plastic cup. The cup contains numbers 1 through 5; the number that you draw will determine the scenario-that-counts.

    - We will circle this scenario on the Decision Form that you will fill out. The assistant will then resolve the lottery that you chose for the scenario-that-counts.

Your choices will be kept strictly confidential.

Should you have any questions before making your choices, please raise your hand and I will come by your desk.

Now you can go ahead and complete the last form.

Participant ID Number: ____

Decision Form #3

Please indicate your choice for each scenario by checking the corresponding option.

For Scenario #1, simply repeat the choice you made on Decision Form #2.

Scenario	I want to have DIE 1 rolled	I want to have DIE 2 rolled	I want to have BOTH dice rolled
#1			
#2			
#3			
#4			
#5			

Please raise your hand once you are done.

We will come by your desk to determine the scenario- that-counts and will circle this scenario on the table.

Then you will grab the envelopes and this Decision Form, and you will line up in the hallway to play the lottery. Once your lottery has been resolved, you can leave.

AMBIGUITY CONDITION

Procedures

- Participants are recruited using the Anderson Lab's online recruitment system.

- Participants enter the room, are seated at an individual desk, and are asked to sign the Consent Form to participate in the study.

- Once they have agreed to participate in the study, they are assigned a Participant ID Number.

- Participants are given a handout with General Instructions and Specific Instructions #1. The experimenter reads these instructions aloud.

- Participants are given a handout with Specific Instructions #2. These instructions introduce the Original Lottery. The experimenter reads the instructions aloud.

- Once the experimenter finishes reading Specific Instructions #2, the assistants leave the main room and go to two separate rooms next door. They stay there until the end of the session.

- Participants fill out a questionnaire about personal information and a personality questionnaire.

- Participants receive a handout with Specific Instructions #3. These instructions remind them of the Original Lottery. The experimenter reads the instructions aloud.

- Participants receive Decision Form #1. At this time, they are informed that they have the opportunity to switch bags and receive a $0.10 bonus, if they so desire. They make a keep-or-switch decision.

- Participants receive a handout with Specific Instructions #4. These instructions introduce the Diversified Lottery. Then, participants indicate whether or not they want to diversify on Decision Form #2.

- Participants receive a handout with Specific Instructions #5. These instructions introduce the Third-Stage scenarios. The experimenter reads the instructions aloud.

- Participants receive Decision Form #3 and indicate their choice for each Third-Stage scenario.

- After the practice draws, each participant plays the chosen lottery in a room next door.

[The general section of the instructions was identical to the one from the RISK condition (see "General Instructions").]

Specific Instructions #1

- On your desk you can find two empty envelopes and two blank cards. One of the envelopes is labeled "COLOR" and the other is labeled "BAG." Feel free to inspect the envelopes and the cards.

- Now, please pick a color—RED or BLUE.

    - Write down the color on one of the cards.

    - Place the card inside the envelope labeled "COLOR" and close the envelope.

    - Write down you Participant ID # at the bottom.

- Then, please pick a bag—BAG 1 or BAG 2.

    - Write down the bag you picked on the other card.

    - Place the card inside the envelope labeled "BAG" and close the envelope.

Next, I will explain to you what we will use the cards for.

Specific Instructions #2

- Two assistants will help us today. They will do the same things but will proceed independently to help us run the session smoothly. So roughly half of you will interact with one of the assistants, and the other half will interact with the other assistant.

- On the front desk you see two pairs of identical bags. Within each pair, the bags are labeled "BAG 1" and "BAG 2." As of now, they are empty. At the end of the session, each assistant will take a pair of bags with her to a room next door.

- Each assistant will fill each of the two bags with red and blue balls. Each bag will have 10 balls in total.

- One of the assistants will call you individually. Once you are inside the room, she will randomly draw a ball from <u>one</u> of the bags in front of you. Then she will put the ball back into the bag.

- You will use the cards to play an <u>individual</u> lottery. Together, the cards are a ticket to play the lottery.

    - If you picked BAG 1, the assistant will draw a ball from BAG 1. If you picked BAG 2, the assistant will draw a ball from BAG 2.

    - A RED ticket pays $10 if the assistant draws a RED ball from the corresponding bag and $0 if she draws a blue ball.

    - A BLUE ticket pays $10 if the assistant draws a BLUE ball from the corresponding bag and $0 if she draws a red ball.

- Please note that the lottery is real. You will actually receive $10 if you happen to win the prize.

- Now let me tell you how we will determine the compositions of the bags. On the front desk you see an empty plastic cup. You can also see eleven pieces of paper. Each piece of paper features a different number between 0 (inclusive) and 10 (inclusive). Now we will fold them and put them into the plastic cup. The assistant will randomly draw a number and write it down without showing it to anyone else; then she will fold the piece of paper again and put it back into the cup. Next she will repeat this procedure.

    - The first number drawn by the assistant will determine the number of RED balls (out of 10) in BAG 1.

    - The second number will determine the number of RED balls (out of 10) in BAG 2.

    - The assistant is the <u>only</u> person who will know the compositions of the bags. She will not reveal this information to anyone at any time, not even after resolving the lottery.

- At the end of the session, you will line up in the hallway. One of the assistants will call you individually.

    - First, she will open the envelope labeled “BAG” to find out from which bag she has to draw a ball.

    - Then, she will draw a ball from the corresponding bag in front of you.

    - After drawing a ball, she will open the envelope labeled “COLOR” to check whether you won the prize.

- Note that, at the moment of setting up the bags, the assistant will not know which color you are playing. Moreover, she will check your color only <u>after</u> drawing a ball. This way, you can be assured that this is a fair lottery.

Should you have any questions now, please raise your hand, and I will come by your desk. Otherwise, we will proceed with the study.

Next, you will provide some personal information and fill out a personality questionnaire.

[Next, participants filled out the forms “Personal Information” and “Questionnaire: How I am in General,” which were identical to the ones from the RISK condition.]

Specific Instructions #3

Thank you for completing the previous questionnaires.

- Recall that you have a ticket to play an individual lottery that offers a $10 prize.
- The assistant will draw a ball from the corresponding bag in front of you.
    - You will win the prize if the color of your ticket matches the color of the ball drawn.
- The compositions of the bags were randomly determined. The assistant drew two numbers between 0 and 10 independently.
    - The first number determined the number of RED balls (out of 10) in BAG 1.
    - The second number determined the number of RED balls (out of 10) in BAG 2.
- After drawing a ball, the assistant will check the color of your ticket and will record the outcome of the lottery.

Should you have any questions now, please raise your hand, and I will come by your desk. Otherwise, we will proceed with the study.

Now, you can go ahead and complete the following form.

Participant ID Number: ____

Decision Form #1

You have the opportunity to switch bags, if you so desire. (The color of your ticket will remain the same.)

If you switch bags, you will receive $0.10 in addition to what you get from the lottery.

Please indicate your decision below (and fill in the blank between brackets next to the corresponding option):

______ *I want to KEEP the original bag [i.e., BAG ___]*

______ *I want to SWITCH to the alternative bag [i.e., BAG ___]*

Your decision will be kept strictly confidential.

Should you have any questions before making the decision, please raise your hand and I will come by your desk.

Please raise your hand once you are done.

Specific Instructions #4

You now have the opportunity to either play this lottery or play another lottery that I will describe next.

- If you decide to play this lottery, everything will happen as described before.
    - The assistant will draw a ball from the bag you chose on Decision Form #1, and you will get $10 if the color of your ticket matches the color of the ball drawn.
    - Also, if you chose to switch bags on Decision Form #1, you will get $0.10 in addition to what you get from the lottery.
- If instead you decide to play the other lottery, the assistant will draw one ball from each bag. The lottery works as follows:
    - First, the assistant will draw a ball from BAG 1. If the draw is successful, you will get $5 from this draw. Otherwise, you will get $0 from this draw.
    - Then, the assistant will draw a ball from BAG 2. If the draw is successful, you will get $5 from this draw. Otherwise, you will get $0 from this draw.
- To sum up, if you play the lottery in which the assistant draws one ball from each bag, you will get:
    - $10 in total if both draws are successful;
    - $5 in total if only one draw is successful;
    - $0 if neither of the draws is successful.
- Notice that the lottery in which a ball is drawn from each bag does not pay the $0.10 bonus.

Now you can go ahead and complete the following form.

Participant ID Number: ____

Decision Form #2

Please indicate your decision below (and fill in the blank between brackets next to the corresponding option):

______ *I want to play the lottery in which a ball is drawn from <u>the bag I chose</u> on Decision Form #1. [On Decision Form #1, I chose BAG ___]*

______ *I want to play the lottery in which a ball is drawn from <u>each bag</u>*

Your decision will be kept strictly confidential.

Should you have any questions before making the decision, please raise your hand and I will come by your desk.

Please raise your hand once you are done.

Specific Instructions #5

In a moment you will fill out the last form.

- Before resolving the lottery, and regardless of the lottery you chose, the assistant will draw one ball from each bag in front of you.
  - These are practice draws, so they do not count towards the lottery.
  - After drawing a ball and showing it to you, the assistant will put the ball back into the bag.
- You can either play the lottery you already chose or change your choice based on the outcomes of the practice draws.
- Notice there are four possible scenarios with regard to the practice draws:
  - The assistant draws a RED ball from each bag.
  - The assistant draws a BLUE ball from each bag.
  - The assistant draws a RED ball from BAG 1 and a BLUE ball from BAG 2.
  - The assistant draws a BLUE ball from BAG 1 and a RED ball from BAG 2.
- In each scenario, you will choose one of three options:
  - play the lottery in which one ball is drawn from BAG 1;
  - play the lottery in which one ball is drawn from BAG 2;
  - play the lottery in which a ball is drawn from each bag.
- You will get the $0.10 bonus if (i) you choose a lottery in which a single ball is drawn, and (ii) the bag you choose is not the one that you wrote on the card originally.
- You will make a choice for each scenario before the assistant performs the practice draws. Of course, only one scenario will occur once the assistant performs the practice draws. This scenario will be the one-that-counts. The assistant will then resolve the lottery you chose for the scenario-that-counts.

  Your choices will be kept strictly confidential.

Should you have any questions before making your choices, please raise your hand and I will come by your desk.
Now you can go ahead and complete the last form.

Participant ID Number: ____

Decision Form #3

Please indicate your decision for each scenario:

If the assistant draws a RED ball from each bag in the practice draws:

______ *I want to play the lottery in which one ball is drawn from BAG 1*

______ *I want to play the lottery in which one ball is drawn from BAG 2*

______ *I want to play the lottery in which a ball is drawn from <u>each</u> bag*

If the assistant draws a BLUE ball from each bag in the practice draws:

______ *I want to play the lottery in which one ball is drawn from BAG 1*

______ *I want to play the lottery in which one ball is drawn from BAG 2*

______ *I want to play the lottery in which a ball is drawn from <u>each</u> bag*

If the assistant draws a RED ball from BAG 1 and a BLUE ball from BAG 2:

______ *I want to play the lottery in which one ball is drawn from BAG 1*

______ *I want to play the lottery in which one ball is drawn from BAG 2*

______ *I want to play the lottery in which a ball is drawn from <u>each</u> bag*

If the assistant draws a BLUE ball from BAG 1 and a RED ball from BAG 2:

______ *I want to play the lottery in which one ball is drawn from BAG 1*

______ *I want to play the lottery in which one ball is drawn from BAG 2*

______ *I want to play the lottery in which a ball is drawn from <u>each</u> bag*

Please raise your hand once you are done.
You will take the envelopes and this Decision Form with you to play the lottery. Once your lottery has been resolved, you can leave.