Minimal Frames and Transparent Frames for Risk, Time, and Uncertainty: Supplementary Materials

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SM1. Statistical Modeling and Estimation Details Behind Section 5.3 and Figure 11

Notation for Design, Pairs, Subjects and Choices

We have 100 lottery pairs $\{R_j, S_j\}$, $j \in \{1,2,\dots,100\}$. In the 94 pairs $j \in \{1,2,\dots,94\}$, the lotteries are probability distributions $R_j = (r_j^l, r_j^m, r_j^h)$ and $S_j = (s_j^l, s_j^m, s_j^h)$ on a shared three-outcome vector $\mathcal{O}_j = (l_j, m_j, h_j)$ specific to each pair j, where $\$0 \le l_j < m_j < h_j \le \$60$: In those pairs R_j is *risky* relative to the *safe* S_j in the sense that R_j has more mass on the two extreme outcomes and less mass on the middle outcome ($r_j^l > s_j^l$ and $r_j^h > s_j^h$, but $r_j^m < s_j^m$). In the 6 pairs $j \in \{95,96,\dots,100\}$, the lotteries are probability distributions $R_j = (r_j^0, r_j^l, r_j^m, r_j^h)$ and $S_j = (s_j^0, s_j^l, s_j^m, s_j^h)$ on a shared four-outcome vector $\mathcal{O}_j = (0, l_j, m_j, h_j)$ specific to each pair j, where $\$0 < l_j < m_j < h_j \le \$40$: In those pairs R_j stochastically dominates S_j. We let $c_j^s = 1$ if subject $s \in \{1,2,\dots,137\}$ chose R_j from pair j (with $c_j^s = 0$ if she chose S_j). The design information (explanatory variables) for each c_j^s is a vector X_j composed of R_j, S_j, $\mathcal{O}_j$ and the frame $[\![\mathbf{r}_j, \mathbf{s}_j]\!]$ of pair j; and $X = (X_1, X_2, \dots, X_{100})$ is all of this design information. As mentioned in the text, we let $\mathcal{J}$ denote either of two mutually exclusive and exhaustive subsets of our 100 pairs j: $\mathcal{T}$ (all pairs j transparently framed, 30 pairs in all) and its complement $\mathcal{N}$ (all pairs j *not* transparently framed—70 pairs in all). We also let $c_{\mathcal{J}}^s$ denote the vectors of all observations in each subset $\mathcal{J} \in \{\mathcal{T}, \mathcal{N}\}$.

Parameters of the SWUP and RDU Models

As mentioned in the text, we let $\mathcal{M}$ denote either of two models $\mathcal{S}$ (for SWUP) and $\mathcal{R}$ (for RDU/CPT). Each pair $j \in \{1,2,\dots,100\}$ has three or four possible outcomes $0 \le l_j < m_j < h_j$ within it, and our utility or value function for those outcomes is $u(z|\kappa_{\mathcal{M}}^s) = (1-\kappa_{\mathcal{M}}^s)^{-1}\left[-1 + (1+z)^{(1-\kappa_{\mathcal{M}}^s)}\right]$ for all $z \ge 0$:[1] This utility function is defined (and identically zero) at $z = 0$ for all real $\kappa_{\mathcal{M}}^s$. We subscript the utility curvature parameter (and other parameters, as appropriate) by $\mathcal{M}$ to emphasize that it can depend on the model estimated. The parameter $\lambda_{\mathcal{M}}^s$ is an inverse standard deviation of decision noise, frequently called *precision* or *sensitivity* in literature on probabilistic choice models. The RDU model additionally has a *weighting function* and we use a two-parameter (α^s and β^s) form due to Prelec (1998) for this weighting function.[2] The SWUP model

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[1] This is one of the HARA (hyperbolic absolute risk aversion) utility functions: For $\rho > 0$, this one exhibits declining absolute risk aversion but increasing relative risk aversion.

[2] This is $w(G) = \exp(-\beta[-\ln(G)]^{\alpha})$, where G is the decumulative distribution function of a lottery.

additionally has *salience functions* but, as discussed in the text, we use the parameter-free *DAS-IPS* salience function in (11) for SWUP models (adding no parameters). We let $\theta_{\mathcal{R}}^{s} = (\kappa_{\mathcal{R}}^{s}, \alpha^{s}, \beta^{s}, \lambda_{\mathcal{R}}^{s})$ and $\theta_{\mathcal{S}}^{s} = (\kappa_{\mathcal{S}}^{s}, \lambda_{\mathcal{S}}^{s})$ denote parameter vectors for subject s under the RDU and SWUP models, respectively.

Choice Probabilities and Likelihood Functions

Let $P_{\mathcal{M}}(X_j, \theta_{\mathcal{M}}^{s})$ denote a *risky choice probability*: This is the probability (under model $\mathcal{M}$) that subject s with parameters $\theta_{\mathcal{M}}^{s}$ chooses R_j from pair *j* (the probability that $c_j^s = 1$ under model $\mathcal{M}$). The associated likelihood of observation c_j^s (under model $\mathcal{M}$) is then:

(SM1.1) $$L_{\mathcal{M}}(c_j^s | X_j, \theta_{\mathcal{M}}^{s}) = \quad 1(c_j^s = 1)P_{\tau}(X_j, \theta_{\mathcal{M}}^{s}) + 1(c_j^s = 0)[1 - P_{\tau}(X_j, \theta_{\mathcal{M}}^{s})].$$

Multiplying these together across subject s's 70 choices $j \in \mathcal{N}$, we get the likelihood (under model $\mathcal{M}$) of subject s's choice vector $c_{\mathcal{N}}^{s}$ in pairs that are *not* transparently framed:

(SM1.2) $$L_{\mathcal{M}}(c_{\mathcal{N}}^{s} | X_j, \theta_{\mathcal{M}}^{s}) = \quad \prod_{j \in \mathcal{N}} L_{\mathcal{M}}(c_j^s | X_j, \theta_{\mathcal{M}}^{s}).$$

Let $\hat{\theta}_{\mathcal{M},\mathcal{N}}^{s}$ maximize the likelihood in (SM1.2): These are "in-sample" (a.k.a. training or calibration) estimates. Similarly to (SM1.2), multiply together the likelihoods in (SM1.1) across subject s's 30 choices $j \in \mathcal{T}$ to get the likelihood (under model $\mathcal{M}$) of subject s's choice vector $c_{\mathcal{N}}^{s}$ in pairs that *are* transparently framed:

(SM1.3) $$L_{\mathcal{M}}(c_{\mathcal{T}}^{s} | X_j, \theta_{\mathcal{M}}^{s}) = \quad \prod_{j \in \mathcal{T}} L_{\mathcal{M}}(c_j^s | X_j, \theta_{\mathcal{M}}^{s}).$$

The *Generalization Criterion* "g" for subject s is then:

(SM1.4) $$g^s(\mathcal{S}, \mathcal{R}) = \quad 2\ln[L_{\mathcal{S}}(c_{\mathcal{T}}^{s} | \hat{\theta}_{\mathcal{S},\mathcal{N}}^{s})] - 2\ln[L_{\mathcal{R}}(c_{\mathcal{T}}^{s} | \hat{\theta}_{\mathcal{R},\mathcal{N}}^{s})].$$

The Risky Choice Probabilities

To make these likelihood-based expressions computable, we need computable expressions for $P_{\mathcal{M}}(X_j, \theta_{\mathcal{M}}^{s})$ for both models $\mathcal{M}$. Let $\Lambda(x) = [1 + e^{-x}]^{-1}$, the Logistic distribution function. For the RDU model, construct *decision weights* $\pi^z(Q)$ for any four-outcome lottery $Q = (q^0, q^l, q^m, q^h)$ as follows:

(SM1.5)
$$\pi^h(Q | \alpha^s, \beta^s) = w(q^h | \alpha^s, \beta^s);$$
$$\pi^m(Q | \alpha^s, \beta^s) = w(q^m + q^h | \alpha^s, \beta^s) - w(q^h | \alpha^s, \beta^s);$$
$$\pi^l(Q | \alpha^s, \beta^s) = w(q^l + q^m + q^h | \alpha^s, \beta^s) - w(q^m + q^h | \alpha^s, \beta^s); \text{ and}$$
$$\pi^0(Q | \alpha^s, \beta^s) = 1 - w(q^l + q^m + q^h | \alpha^s, \beta^s),$$

where $w(G|\alpha^s, \beta^s) = \exp(-\beta[-\ln(G)]^\alpha)$ is the two-parameter Prelec (1998) weighting function. For RDU models we then have the "value difference"

$$\text{(SM1.6)} \qquad D_{\mathcal{R}}\big(X_j, \kappa_{\mathcal{R}}^s, \alpha^s, \beta^s\big) = \sum_{z \in \mathcal{O}_j} \big[\pi^z(R_j|\alpha^s, \beta^s) - \pi^z(S_j|\alpha^s, \beta^s)\big] u_j(z|\rho^k),$$

and the associated risky choice probability

$$\text{(SM1.7)} \qquad P_{\mathcal{R}}\big(X_j, \kappa_{\mathcal{R}}^s, \alpha^s, \beta^s, \lambda_{\mathcal{R}}^s\big) = \Lambda\big[\lambda_{\mathcal{R}}^s D_{\mathcal{R}}\big(X_j, \kappa_{\mathcal{R}}^s, \alpha^s, \beta^s\big) / \mathcal{B}_{\mathcal{R}}\big(X_j, \kappa_{\mathcal{R}}^s, \alpha^s, \beta^s\big)\big].$$

The expression $\mathcal{B}_{\mathcal{R}}\big(X_j, \kappa_{\mathcal{R}}^s, \alpha^s, \beta^s\big)$ is a normalization of the value difference $D_{\mathcal{R}}\big(X_j, \kappa_{\mathcal{R}}^s, \alpha^s, \beta^s\big)$ suggested by Blavatskyy (2014): This will be discussed fully in the next section.

For SWUP, the 100 frames $[\![R_j, S_j]\!]$ have two, three or four *column blocks*. Here we illustrate the computable SWUP risky choice probabilities using a three column block example:

(SM1.8) $\qquad [\![R_j, S_j]\!] =$

R_j	$\mathbf{x}_{\mathbf{1}j}$	$\mathbf{r}_{\mathbf{1}j}$	$\mathbf{x}_{\mathbf{2}j}$	$\mathbf{r}_{\mathbf{2}j}$	$\mathbf{x}_{\mathbf{3}j}$	$\mathbf{r}_{\mathbf{3}j}$
S_j	$\mathbf{y}_{\mathbf{1}j}$	$\mathbf{s}_{\mathbf{1}j}$	$\mathbf{y}_{\mathbf{2}j}$	$\mathbf{s}_{\mathbf{2}j}$	$\mathbf{y}_{\mathbf{3}j}$	$\mathbf{s}_{\mathbf{3}j}$

Define the following expressions:

$\|\mathbf{x}_j, \mathbf{y}_j\| \equiv \|\mathbf{x}_{\mathbf{1}j}, \mathbf{x}_{\mathbf{2}j}, \mathbf{x}_{\mathbf{3}j}, \mathbf{y}_{\mathbf{1}j}, \mathbf{y}_{\mathbf{2}j}, \mathbf{y}_{\mathbf{3}j}\|$, the Euclidean norm of the outcome vector in the frame;

$\|\mathbf{r}_j, \mathbf{s}_j\| \equiv \|\mathbf{r}_{\mathbf{1}j}, \mathbf{r}_{\mathbf{2}j}, \mathbf{r}_{\mathbf{3}j}, \mathbf{s}_{\mathbf{1}j}, \mathbf{s}_{\mathbf{2}j}, \mathbf{s}_{\mathbf{3}j}\|$, the Euclidean norm of the probability vector in the frame;

$\sigma_z(\mathbf{x}_{\mathbf{i}j}, \mathbf{y}_{\mathbf{i}j}) \equiv |\mathbf{x}_{\mathbf{i}j} - \mathbf{y}_{\mathbf{i}j}| / \big(|\mathbf{x}_{\mathbf{i}j}| + |\mathbf{y}_{\mathbf{i}j}| + \|\mathbf{x}_j, \mathbf{y}_j\|\big)$, the *DAS-IPS salience* of outcome difference **i**;

$\sigma_p(\mathbf{r}_{\mathbf{i}j}, \mathbf{s}_{\mathbf{i}j}) \equiv |\mathbf{r}_{\mathbf{i}j} - \mathbf{s}_{\mathbf{i}j}| / \big(|\mathbf{r}_{\mathbf{i}j}| + |\mathbf{s}_{\mathbf{i}j}| + \|\mathbf{r}_j, \mathbf{s}_j\|\big)$, the *DAS-IPS salience* of probability difference **i**;

$I_z(\mathbf{r}_{\mathbf{i}j}, \mathbf{s}_{\mathbf{i}j}) \equiv (\mathbf{r}_{\mathbf{i}j} + \mathbf{s}_{\mathbf{i}j})/2$, the *importance* of outcome difference **i**;

$I_p(\mathbf{x}_{\mathbf{i}j}, \mathbf{y}_{\mathbf{i}j}|\kappa_{\mathcal{S}}^s) \equiv \big[u_j\big(\mathbf{x}_{\mathbf{i}j}|\kappa_{\mathcal{S}}^s\big) + u_j\big(\mathbf{y}_{\mathbf{i}j}|\kappa_{\mathcal{S}}^s\big)\big]/2$, the *importance* of probability difference **i**;

$\omega_{z\mathbf{i}j} = \sigma_z\big(\mathbf{x}_{\mathbf{i}j}, \mathbf{y}_{\mathbf{i}j}\big) \cdot I_z\big(\mathbf{r}_{\mathbf{i}j}, \mathbf{s}_{\mathbf{i}j}\big)$, the *weight* on outcome utility difference **i**; and

$\omega_{p\mathbf{i}j}(\kappa_{\mathcal{S}}^s) = \sigma_p(\mathbf{r}_{\mathbf{i}j}, \mathbf{s}_{\mathbf{i}j}) \cdot I_p(\mathbf{x}_{\mathbf{i}j}, \mathbf{y}_{\mathbf{i}j}|\kappa_{\mathcal{S}}^s)$, the *weight* on probability difference **i**.

Using these expressions along with the left-hand-side of text inequality (4), the "value difference" for the comparative form of SWUP is

$$\text{(SM1.9)} \qquad D_{\mathcal{S}}\big(X_j, \kappa_{\mathcal{S}}^s\big) = \sum_{\mathbf{i}} \big\{\omega_{p\mathbf{i}j}(\kappa_{\mathcal{S}}^s) \cdot (\mathbf{r}_{\mathbf{i}j} - \mathbf{s}_{\mathbf{i}j}) + \omega_{z\mathbf{i}j} \cdot \big[u\big(\mathbf{x}_{\mathbf{i}j}|\rho^k\big) - u\big(\mathbf{y}_{\mathbf{i}j}|\rho^k\big)\big]\big\},$$

with an associated risky choice probability

$$\text{(SM1.10)} \qquad P_{\mathcal{S}}\big(X_j, \kappa_{\mathcal{S}}^s, \lambda_{\mathcal{S}}^s\big) = \Lambda\big[\lambda_{\mathcal{S}}^s D_{\mathcal{S}}\big(X_j, \kappa_{\mathcal{S}}^s\big) / \mathcal{B}_{\mathcal{S}}\big(X_j, \kappa_{\mathcal{S}}^s\big)\big].$$

The expression $\mathcal{B}_{\mathcal{S}}(X_j, \kappa_{\mathcal{S}}^s)$ is again a normalization of the value difference $D_{\mathcal{S}}(X_j, \kappa_{\mathcal{S}}^s)$ suggested by Blavatskyy (2014): We now turn to these normalizations.

The Blavatskyy Normalization of Value Differences

Normalization of value differences is a common feature of many probabilistic choice models (e.g. Carroll and DeSoete 1991; Busemeyer and Townsend 1993). Recently, Wilcox (2008, 2011) pointed out a theoretical difficulty with probabilistic choice models of choice under risk in the "strong utility" family (Luce and Suppes 1965) and suggested a modification of them based on a particular normalization of value differences. The theoretical difficulty was confirmed by Blavatskyy (2011), and Apesteguia and Ballester (2018) deepened appreciation that the problem is a general one. Here we use the "Stronger Utility" normalization suggested by Blavatskyy (2014) because it is particularly suited to data containing stochastic dominance pairs (such as ours).

For each pair j, derive two "bounding lotteries" $\overline{RS}_j$ and $\underline{RS}_j$ from lotteries R_j and S_j: $\overline{RS}_j$ is the stochastic dominance supremum of lotteries R_j and S_j, while $\underline{RS}_j$ is the stochastic dominance infimum of lotteries R_j and S_j. Put differently, $\overline{RS}_j$ is the least desirable lottery that still stochastically dominates both lotteries R_j and S_j, while $\underline{RS}_j$ is the most desirable lottery that is nevertheless stochastically dominated by both lotteries R_j and S_j. Let $\tilde{X}_j = \{\overline{RS}_j, \underline{RS}_j\}$ be the "choice pair" between these bounding lotteries: Then Blavatskyy's Stronger Utility normalization for RDU is just $\mathcal{B}_{\mathcal{R}}(X_j, \kappa_{\mathcal{R}}^s, \alpha^s, \beta^s) \equiv D_{\mathcal{R}}(\tilde{X}_j, \kappa_{\mathcal{R}}^s, \alpha^s, \beta^s)$.

Blavatskyy developed this normalization for use with decision-theoretic models that assign values to alternatives (such as RDU). Here we generalize it to models (such as SWUP) that are comparative. For instance the normalization becomes $\mathcal{B}_{\mathcal{S}}(X_j, \kappa_{\mathcal{S}}^s) \equiv D_{\mathcal{S}}(\tilde{X}_j, \kappa_{\mathcal{S}}^s)$ for the comparative SWUP model. In fact, the plausibility of this minor extension of Stronger Utility is an additional reason we choose it for this particular work: We estimate both a value representation (RDU) and a comparative representation (SWUP), and prefer a common normalization for both. An example aids understanding of Blavatskyy's "bounding lotteries" $\overline{RS}_j$ and $\underline{RS}_j$. Rows 1 and 2 of Table A1.1 show pair 2 from Allais Paradox Group A in a minimal frame, while rows 3 and 4 show $\overline{RS}$ and $\underline{RS}$ for this pair.

Table A1.1 Example of Blavatskyy's Bounding Options
(Allais Paradox Group A, Pair 2, Minimal Frame)

design info	row	lottery		money	prob	money	prob	money	prob
X	1	R		40	0.4	0	0.6		
	2	S		25	0.5	0	0.5		
$\tilde{X}$	3	$\overline{RS}$		40	0.4	25	0.1	0	0.5
	4	$\underline{RS}$		25	0.4	0	0.6	0	0

This completes the description of the models we estimated.

Estimation Notes

The estimations were carried out using the SAS 9.4 "Proc NLP" (nonlinear programming procedure) to minimize the negative of the natural logarithm of the likelihood functions, using the Trust Region algorithm (Dennis et al., 1981; Gay, 1983). The "proc nlp" statement is reproduced below to provide all algorithm tuning information:

```
proc nlp tech=trureg maxit=25000 maxfunc=75000 instep=1e-8 ;
```

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SM2. Analysis of Behavior in Minimal Frames (Calculations for Proposition 1)

To focus on the role of the salience functions in driving our results, we set $u(x) = x$ in our analysis. We illustrate the model using the parameter-free salience function:

(SM2.1) $$\sigma(\mathbf{a_i}, \mathbf{b_i}) = \frac{|\mathbf{a_i} - \mathbf{b_i}|}{|\mathbf{a_i}| + |\mathbf{b_i}|}.$$

As a robustness check we also use the parameter-free IPS salience function (where $\|\mathbf{a}, \mathbf{b}\|$ is the Euclidean norm of vector $(\mathbf{a}, \mathbf{b})$ (based on all payoffs or all probabilities or time periods in a frame):

(SM2.2) $$\sigma(\mathbf{a_i}, \mathbf{b_i}|\mathbf{a}, \mathbf{b}) = \frac{|\mathbf{a_i} - \mathbf{b_i}|}{|\mathbf{a_i}| + |\mathbf{b_i}| + \|\mathbf{a}, \mathbf{b}\|}.$$

To summarize, we demonstrate that all results below hold for Specification 1 and Specification 2:

Specification 1: $u(x) = x$, $\sigma(\mathbf{a_i}, \mathbf{b_i}) = |\mathbf{a}_i - \mathbf{b}_i| / (|\mathbf{a}_i| + |\mathbf{b}_i|)$.

Specification 2: $u(x) = x$, $\sigma(\mathbf{a_i}, \mathbf{b_i}) = |\mathbf{a_i} - \mathbf{b_i}| / (|\mathbf{a_i}| + |\mathbf{b_i}| + \|\mathbf{a}, \mathbf{b}\|)$.

Calculations for Ellsberg's paradox are not shown here as that is derived under more general conditions (for any salience function and any utility function) in the proof of Proposition 2.

1. Demonstration that SWUP explains violations of Stochastic Dominance in minimal frames.

For the minimal presentation in the upper panel of Figure 3, *q'* is chosen over *p'* if

$$\phi(0.07, 0.06)(0.01)(45) - \mu(-10, 30)(40)(0.01) + \phi(0.02, 0.03)(0.01)(15) < 0.$$

For Specification 1, *q'* is chosen over *p'* since (0.06462) – (0.40) < 0.

For Specification 2, *q'* is chosen over *p'* since (0.00433) – (0.14015) < 0.

2. Demonstration that SWUP explains the Allais Paradox in minimal frames.

For the minimal presentation of the Allais Paradox in the left panel of Figure 4, q is chosen over p if:

$$\mu(2500, 2400)(33) - \mu(0, 2400)(24) < 0.$$

For Specification 1, q is chosen over p since (33/49) – (24) < 0.

For Specification 2, q is chosen over p since (0.32002) – (7.37325) < 0.

In addition, SWUP predicts that $\tilde{p}$ is chosen over $\tilde{q}$ in the minimal frame in Figure 3 if

$$\mu(2500, 2400)(33.5) - \phi(0.33, 0.34)(24.5) > 0.$$

For Specification 1, $\tilde{p}$ is chosen over $\tilde{q}$ since (3350/4900) – (0.245/0.67) > 0.

For Specification 2, $\tilde{p}$ is chosen over $\tilde{q}$ since (0.40045) – (0.14122) > 0.

3. Demonstration that SWUP explains the Common Ratio Effect in minimal frames

For the example of the common ratio effect observed in the left panel in Figure 5, SWUP predicts that q is chosen over p if the following inequality holds:

$$\mu(4000,3000)(1000)(0.80) - \mu(0,3000)(3000)(0.20) < 0.$$

For Specification 1, q is chosen over p since (800/7) – (600) < 0.

For Specification 2, q is chosen over p since (62.34923) – (203.8285) < 0.

In addition, SWUP predicts that $\tilde{p}$ is chosen over $\tilde{q}$ in the minimal frame in Figure 5 if

$$\mu(4000,3000)(225) - \phi(0.25,0.20)(175) > 0.$$

For Specification 1, $\tilde{p}$ is chosen over $\tilde{q}$ since (225/7) – (0.05/0.45)(175) > 0.

For Specification 2, $\tilde{p}$ is chosen over $\tilde{q}$ since (18.75) – (5.49497) > 0.

4. Demonstration that SWUP explains Present Bias in minimal frames

SWUP predicts present bias in minimal frames (left panel of Figure 12). Let δ be the annual discount factor. SWUP predicts that r is chosen over t in the minimal frame in the top of Figure 12 if:

$$\theta(0,1)(1-\delta)(87.5) - \mu(75,100)(12.5)(1+\delta) > 0.$$

For Specification 1, r is chosen over t if: $(1-\delta)(87.5) > (25/175)(1+\delta)(12.5)$.

That is, if $\delta < 24/25$. Thus r is chosen over t in the minimal frame if $\delta < 0.96$.

For Specification 2, r is chosen over t if: $0.5(1-\delta)(87.5) > (25/300)(1+\delta)(12.5)$. That is, if $\delta < 0.953$.

When both outcomes are delayed 10 years, t' is chosen over r' in the minimal frame if

$$\theta(10, 11)(\delta^{10} - \delta^{11})(87.5) - \mu(75,100)(12.5)(\delta^{10} + \delta^{11}) < 0$$

For Specification 1, t' is chosen over r' if $(25/6)\delta^{10}(1-\delta) - (625/350)\delta^{10}(1+\delta) < 0$.

The above inequality implies $\delta > 2/5$. Thus, t' is chosen over r' in the minimal frame if $\delta > 0.40$.

For Specification 2, t' is chosen over r' if $(0.02788)\delta^{10}(1-\delta) - (25/300)\delta^{10}(1+\delta) < 0$.

The above inequality implies t' is chosen over r' in the minimal frame if $\delta > 0.402$.

SM3. 100 Framed Lottery Pairs from Experiment with Proportion of Risky (R) Choices for each pair

Allais Paradox (Common Consequence Effect) Pairs from Experiment

data set code	group	pair	frame	option	(x1,y1)	(r1,s1)	(x2,y2)	(r2,s2)	(x3,y3)	(r3,s3)	proportion choosing R	90% Confidence lower	90% Confidence upper
cc11	AP.A	1	min	R	40	0.4	25	0.5	0	0.1	0.431	0.363	0.501
				S	25	0.4	25	0.5	25	0.1			
	AP.A	1	trans	R	40	0.4	0	0.1	25	0.5	0.409	0.342	0.479
				S	25	0.4	25	0.1	25	0.5			
cc12	AP.A	2	min	R	40	0.4	0	0.6			0.613	0.543	0.679
				S	25	0.5	0	0.5					
	AP.A	2	trans	R	40	0.4	0	0.1	0	0.5	0.219	0.165	0.281
				S	25	0.4	25	0.1	0	0.5			
cc21	AP.B	1	min	R	40	0.2	25	0.75	0	0.05	0.504	0.434	0.573
				S	25	0.2	25	0.75	25	0.05			
	AP.B	1	trans	R	40	0.2	0	0.05	25	0.75	0.409	0.342	0.479
				S	25	0.2	25	0.05	25	0.75			
cc22	AP.B	2	min	R	40	0.2	0	0.8			0.766	0.703	0.821
				S	25	0.25	0	0.75					
	AP.B	2	trans	R	40	0.2	0	0.05	0	0.75	0.343	0.279	0.412
				S	25	0.2	25	0.05	0	0.75			
cc31	AP.C	1	min	R	40	0.5	25	0.4	0	0.1	0.438	0.370	0.508
				S	25	0.5	25	0.4	25	0.1			
	AP.C	1	trans	R	40	0.5	0	0.1	25	0.4	0.460	0.391	0.530
				S	25	0.5	25	0.1	25	0.4			
cc32	AP.C	2	min	R	40	0.5	0	0.5			0.613	0.543	0.679
				S	25	0.6	0	0.4					
	AP.C	2	trans	R	40	0.5	0	0.1	0	0.4	0.263	0.205	0.328
				S	25	0.5	25	0.1	0	0.4			
cc41	AP.D	1	min	R	40	0.25	25	0.7	0	0.05	0.511	0.441	0.581
				S	25	0.25	25	0.7	25	0.05			
	AP.D	1	trans	R	40	0.25	0	0.05	25	0.7	0.496	0.427	0.566
				S	25	0.25	25	0.05	25	0.7			
cc42	AP.D	2	min	R	40	0.25	0	0.75			0.752	0.688	0.808
				S	25	0.3	0	0.7					
	AP.D	2	trans	R	40	0.25	0	0.05	0	0.7	0.343	0.279	0.412
				S	25	0.25	25	0.05	0	0.7			

Common Ratio Effect Pairs from Experiment

data set code	group	comm. ratio	frame	option	(x1,y1)	(r1,s1)	(x2,y2)	(r2,s2)	(x3,y3)	(r3,s3)	proportion choosing R	90% Confidence lower	upper
cro1234	CR.A	1	both	R	40	0.8	0	0.2			0.073	0.043	0.116
				S	30	0.8	30	0.2					
cro12	CR.A	0.75	min	R'	40	0.6	0	0.4			0.212	0.159	0.273
				S'	30	0.75	0	0.25					
	CR.A	0.75	trans	R'	40	0.6	0	0.15	0	0.25	0.051	0.027	0.089
				S'	30	0.6	30	0.15	0	0.25			
cro22	CR.A	0.50	min	R'	40	0.4	0	0.6			0.321	0.259	0.389
				S'	30	0.5	0	0.5					
	CR.A	0.50	trans	R'	40	0.4	0	0.1	0	0.5	0.066	0.037	0.107
				S'	30	0.4	30	0.1	0	0.5			
cro32	CR.A	0.25	min	R'	40	0.2	0	0.8			0.453	0.384	0.523
				S'	30	0.25	0	0.75					
	CR.A	0.25	trans	R'	40	0.2	0	0.05	0	0.75	0.117	0.078	0.168
				S'	30	0.2	30	0.05	0	0.75			
cro42	CR.A	0.05	min	R'	40	0.04	0	0.96			0.693	0.626	0.755
				S'	30	0.05	0	0.95					
	CR.A	0.05	trans	R'	40	0.04	0	0.01	0	0.95	0.321	0.259	0.389
				S'	30	0.04	30	0.01	0	0.95			
crn1234	CR.B	1	both	R	40	0.75	0	0.25			0.131	0.090	0.184
				S	25	0.75	25	0.25					
crn12	CR.B	0.8	min	R'	40	0.6	0	0.4			0.226	0.172	0.289
				S'	25	0.8	0	0.2					
	CR.B	0.8	trans	R'	40	0.6	0	0.2	0	0.2	0.051	0.027	0.089
				S'	25	0.6	25	0.2	0	0.2			
crn22	CR.B	0.6	min	R'	40	0.45	0	0.55			0.321	0.259	0.389
				S'	25	0.6	0	0.4					
	CR.B	0.6	trans	R'	40	0.45	0	0.15	0	0.4	0.095	0.060	0.142
				S'	25	0.45	25	0.15	0	0.4			
crn32	CR.B	0.4	min	R'	40	0.3	0	0.7			0.453	0.384	0.523
				S'	25	0.4	0	0.6					
	CR.B	0.4	trans	R'	40	0.3	0	0.1	0	0.6	0.153	0.108	0.209
				S'	25	0.3	25	0.1	0	0.6			
crn42	CR.B	0.2	min	R'	40	0.15	0	0.85			0.613	0.543	0.679
				S'	25	0.2	0	0.8					
	CR.B	0.2	trans	R'	40	0.15	0	0.05	0	0.8	0.307	0.245	0.374
				S'	25	0.15	25	0.05	0	0.8			

Stochastic Dominance Pairs from Experiment

data set code	group	frame	opt.	(x1,y1)	(s1,r1)	(x2,y2)	(s2,r2)	(x3,y3)	(s3,r3)	(x4,y4)	(s4,r4)	prop. choosing R	90% Confidence lower	upper
sd1	DV.A	min	S	30	0.9	25	0.06	20	0.01	0	0.03	0.328	0.266	0.397
			R	30	0.9	25	0.07	0	0.01	0	0.02			
	DV.A	trans	S	20	0.01	30	0.9	25	0.06	0	0.03	0.971	0.939	0.988
			R	25	0.01	30	0.9	25	0.06	0	0.03			
sd2	DV.B	min	S	40	0.8	30	0.16	20	0.01	0	0.03	0.19	0.14	0.249
			R	40	0.8	30	0.17	0	0.01	0	0.02			
	DV.B	trans	S	20	0.01	40	0.8	30	0.16	0	0.03	0.978	0.95	0.992
			R	30	0.01	40	0.8	30	0.16	0	0.03			
sd3	DV.C	min	S	30	0.9	20	0.06	10	0.01	0	0.03	0.431	0.363	0.501
			R	30	0.9	20	0.07	0	0.01	0	0.02			
	DV.C	trans	S	10	0.01	30	0.9	20	0.06	0	0.03	0.971	0.939	0.988
			R	20	0.01	30	0.9	20	0.06	0	0.03			

Extra Pairs from Experiment

data set code	frame	option	(x1,y1)	(g1,b1)	(x2,y2)	(g2,b2)	(x3,y3)	(g3,b3)	proportion choosing R	90% Confidence lower	upper
est	min	R	25	0.75	0	0.25			0.212	0.159	0.273
		S	15	0.75	15	0.25					
	min	R	25	0.9	0	0.1			0.504	0.434	0.573
		S	15	0.9	15	0.1					
	min	R	25	0.75	0	0.25			0.650	0.581	0.714
		S	15	0.9	0	0.1					
	min	R	25	0.9	0	0.1			0.482	0.412	0.552
		S	25	0.1	15	0.9					
	min	R	25	0.9	0	0.1			0.387	0.321	0.457
		S	25	0.25	15	0.75					
	min	R	25	0.9	0	0.1			0.285	0.225	0.351
		S	25	0.5	15	0.5					
	min	R	25	0.9	0	0.1			0.124	0.084	0.176
		S	25	0.75	15	0.25					
	min	R	40	0.5	0	0.5			0.204	0.153	0.265
		S	15	0.5	15	0.5					
	min	R	40	0.75	0	0.25			0.489	0.419	0.559
		S	15	0.75	15	0.25					
	min	R	40	0.9	0	0.1			0.759	0.695	0.815
		S	15	0.9	15	0.1					
	min	R	40	0.5	0	0.5			0.328	0.266	0.397
		S	15	0.9	0	0.1					
	min	R	40	0.75	0	0.25			0.774	0.711	0.828
		S	15	0.9	0	0.1					

Extra Pairs from Experiment (continued)

data set code	frame	option	(x1,y1)	(g1,b1)	(x2,y2)	(g2,b2)	(x3,y3)	(g3,b3)	proportion choosing R	90% Confidence lower	upper
	min	R	40	0.5	0	0.5			0.577	0.506	0.644
		S	15	0.75	0	0.25					
	min	R	40	0.25	0	0.75			0.328	0.266	0.397
		S	15	0.5	0	0.5					
	min	R	40	0.1	0	0.9			0.387	0.321	0.457
		S	15	0.25	0	0.75					
	min	R	40	0.75	0	0.25			0.416	0.349	0.486
		S	40	0.1	15	0.9					
	min	R	40	0.9	0	0.1			0.745	0.680	0.802
		S	40	0.1	15	0.9					
	min	R	40	0.75	0	0.25			0.343	0.279	0.412
		S	40	0.25	15	0.75					
	min	R	40	0.9	0	0.1			0.701	0.634	0.762
		S	40	0.25	15	0.75					
	min	R	40	0.75	0	0.25			0.153	0.108	0.209
		S	40	0.5	15	0.5					
	min	R	40	0.9	0	0.1			0.569	0.499	0.637
		S	40	0.5	15	0.5					
	min	R	40	0.9	0	0.1			0.336	0.272	0.404
		S	40	0.75	15	0.25					
est	min	R	40	0.75	0	0.25			0.182	0.133	0.241
		S	25	0.75	25	0.25					
	min	R	40	0.9	0	0.1			0.577	0.506	0.644
		S	25	0.9	25	0.1					
	min	R	40	0.75	0	0.25			0.387	0.321	0.457
		S	25	0.9	0	0.1					
	min	R	40	0.5	0	0.5			0.219	0.165	0.281
		S	25	0.75	0	0.25					
	min	R	40	0.9	0	0.1			0.518	0.448	0.588
		S	40	0.1	25	0.9					
	min	R	40	0.9	0	0.1			0.445	0.377	0.515
		S	40	0.25	25	0.75					
	min	R	40	0.9	0	0.1			0.307	0.245	0.374
		S	40	0.5	25	0.5					
	min	R	40	0.25	15	0.75			0.350	0.286	0.419
		S	25	0.25	25	0.75					
	min	R	40	0.5	15	0.5			0.606	0.536	0.672
		S	25	0.5	25	0.5					
	min	R	40	0.5	15	0.5			0.788	0.727	0.841
		S	25	0.9	15	0.1					
	min	R	40	0.25	15	0.75			0.511	0.441	0.581
		S	25	0.75	15	0.25					

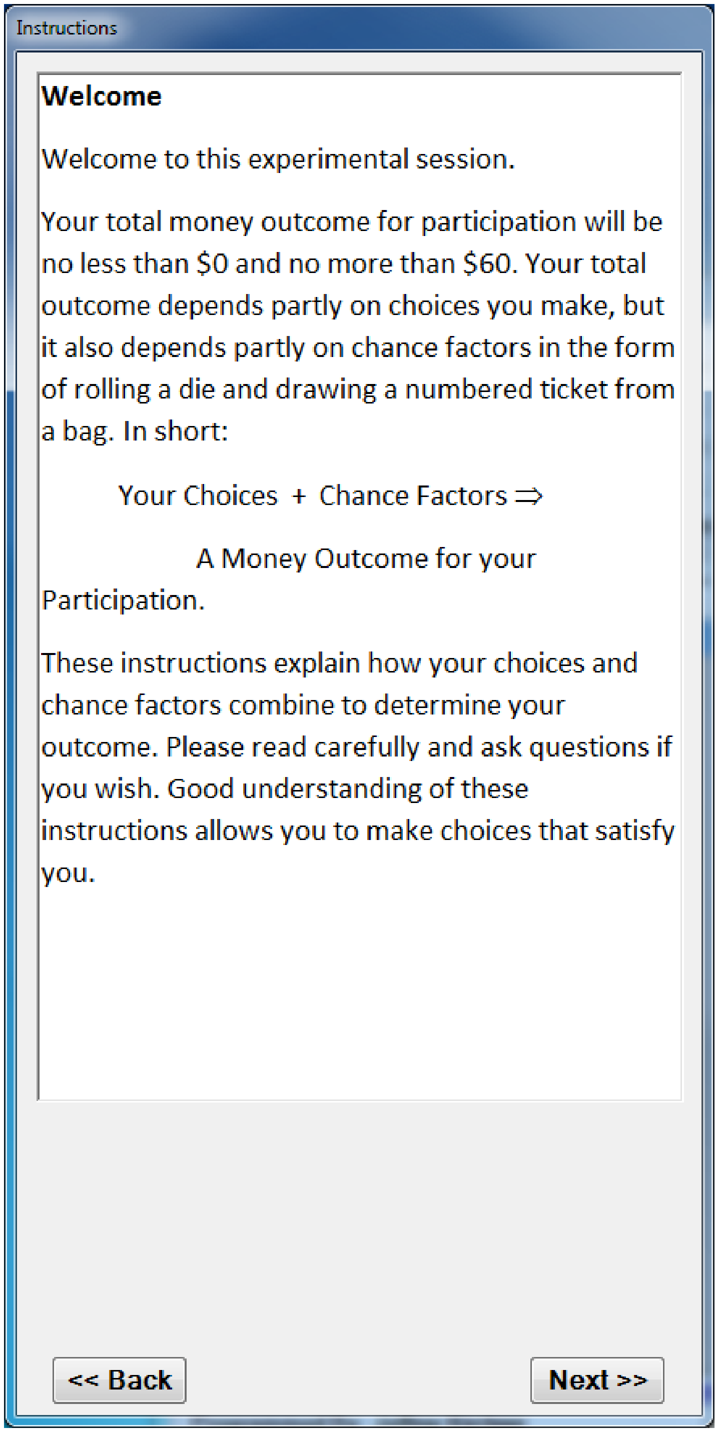
Extra Pairs from Experiment (continued)

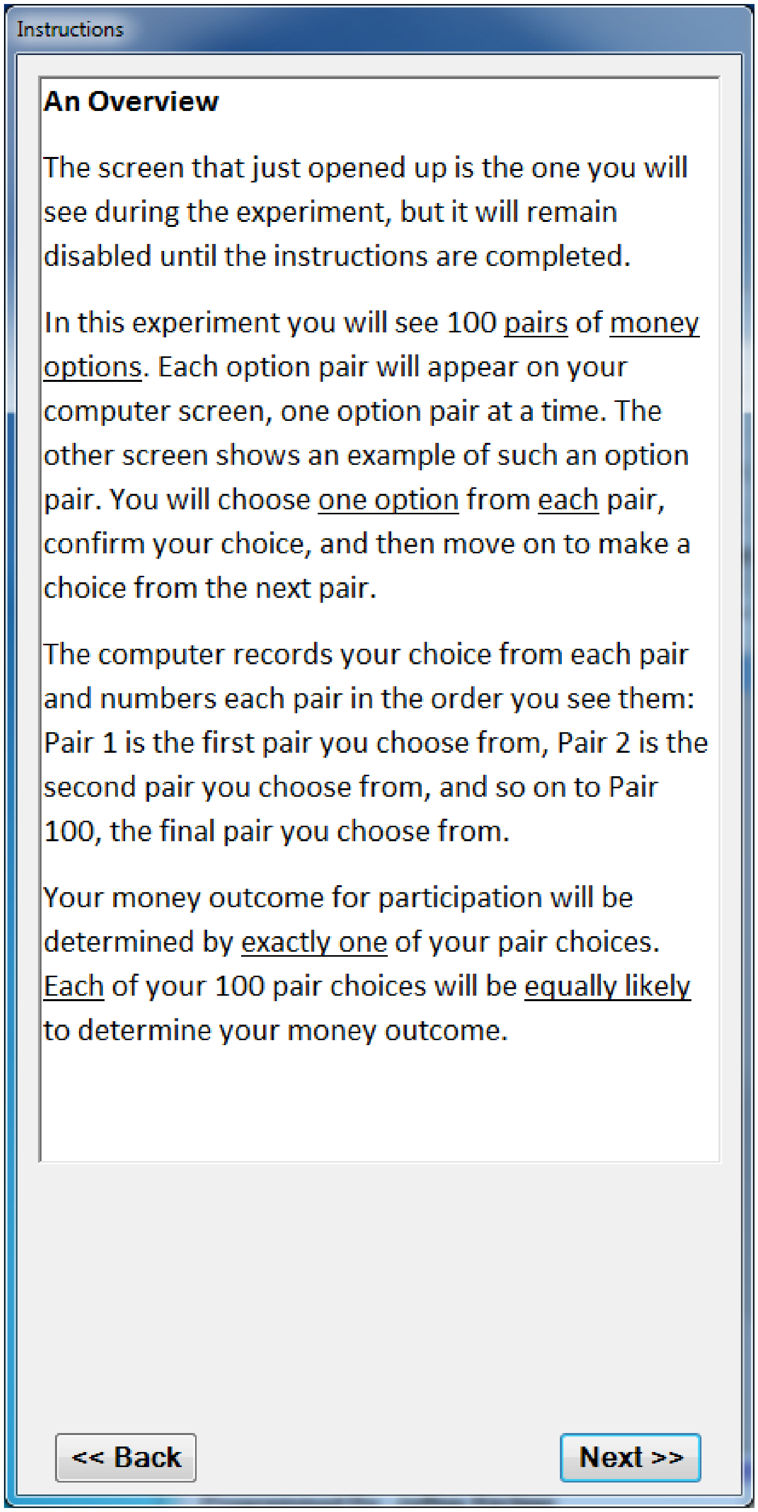
data set code	frame	option	(x1,y1)	(g1,b1)	(x2,y2)	(g2,b2)	(x3,y3)	(g3,b3)	proportion choosing R	90% Confidence lower	upper
est	min	R	40	0.5	15	0.5			0.847	0.791	0.892
		S	25	0.75	15	0.25					
	min	R	40	0.25	15	0.75			0.693	0.626	0.755
		S	25	0.5	15	0.5					
	min	R	40	0.1	15	0.9			0.628	0.558	0.693
		S	25	0.25	15	0.75					
	min	R	40	0.5	15	0.5			0.620	0.551	0.686
		S	40	0.1	25	0.9					
	min	R	40	0.75	15	0.25			0.723	0.657	0.782
		S	40	0.1	25	0.9					
	min	R	40	0.5	15	0.5			0.416	0.349	0.486
		S	40	0.25	25	0.75					
	min	R	40	0.75	15	0.25			0.737	0.672	0.795
		S	40	0.25	25	0.75					
	min	R	40	0.75	15	0.25			0.489	0.419	0.559
		S	40	0.5	25	0.5					
	min	R	40	0.9	15	0.1			0.752	0.688	0.808
		S	40	0.5	25	0.5					
	min	R	40	0.9	15	0.1			0.620	0.551	0.686
		S	40	0.75	25	0.25					
sim11	trans	R	60	0.55	20	0.45			0.810	0.751	0.860
		S	35	0.55	35	0.45					
sim12	trans	R	60	0.5	20	0.5			0.825	0.767	0.873
		S	35	0.5	35	0.5					
sim13	trans	R	60	0.45	20	0.55			0.745	0.680	0.802
		S	35	0.45	35	0.55					
sim21	trans	R	60	0.35	15	0.65			0.810	0.751	0.860
		S	25	0.35	25	0.65					
sim22	trans	R	60	0.3	15	0.7			0.803	0.743	0.854
		S	25	0.3	25	0.7					
sim23	trans	R	60	0.25	15	0.75			0.766	0.703	0.821
		S	25	0.25	25	0.75					
sim31	trans	R	60	0.15	10	0.85			0.854	0.799	0.898
		S	15	0.15	15	0.85					
sim32	trans	R	60	0.1	10	0.9			0.854	0.799	0.898
		S	15	0.1	15	0.9					
sim33	trans	R	60	0.05	10	0.95			0.642	0.573	0.707
		S	15	0.05	15	0.95					

Extra Pairs from Experiment (continued)

data set code	frame	option	(x1,y1)	(g1,b1)	(x2,y2)	(g2,b2)	(x3,y3)	(g3,b3)	proportion choosing R	90% Confidence lower	upper
sip11	payoff-aligned	R	40	0.25	15	0.4	0	0.35	0.774	0.711	0.828
		S	40	0.1	15	0.6	0	0.3			
sip12	payoff-aligned	R	40	0.25	15	0.2	0	0.55	0.686	0.618	0.748
		S	40	0.1	15	0.4	0	0.5			
sip13	payoff-aligned	R	40	0.25	15	0.1	0	0.65	0.686	0.618	0.748
		S	40	0.1	15	0.3	0	0.6			
sip14	payoff-aligned	R	40	0.25	15	0	0	0.75	0.365	0.300	0.434
		S	40	0.1	15	0.2	0	0.7			
sip21	payoff-aligned	R	25	0.2	15	0.7	0	0.1	0.292	0.232	0.359
		S	25	0.1	15	0.85	0	0.05			
sip22	payoff-aligned	R	25	0.2	15	0.2	0	0.6	0.416	0.349	0.486
		S	25	0.1	15	0.35	0	0.55			
sip23	payoff-aligned	R	25	0.2	15	0.1	0	0.7	0.416	0.349	0.486
		S	25	0.1	15	0.25	0	0.65			
sip24	payoff-aligned	R	25	0.2	15	0	0	0.8	0.234	0.179	0.297
		S	25	0.1	15	0.15	0	0.75			

SM4. Experimental Instructions (Screen Shots)




Instructions

An Overview

The screen that just opened up is the one you will see during the experiment, but it will remain disabled until the instructions are completed.

In this experiment you will see 100 pairs of money options. Each option pair will appear on your computer screen, one option pair at a time. The other screen shows an example of such an option pair. You will choose one option from each pair, confirm your choice, and then move on to make a choice from the next pair.

The computer records your choice from each pair and numbers each pair in the order you see them: Pair 1 is the first pair you choose from, Pair 2 is the second pair you choose from, and so on to Pair 100, the final pair you choose from.

Your money outcome for participation will be determined by exactly one of your pair choices. Each of your 100 pair choices will be equally likely to determine your money outcome.

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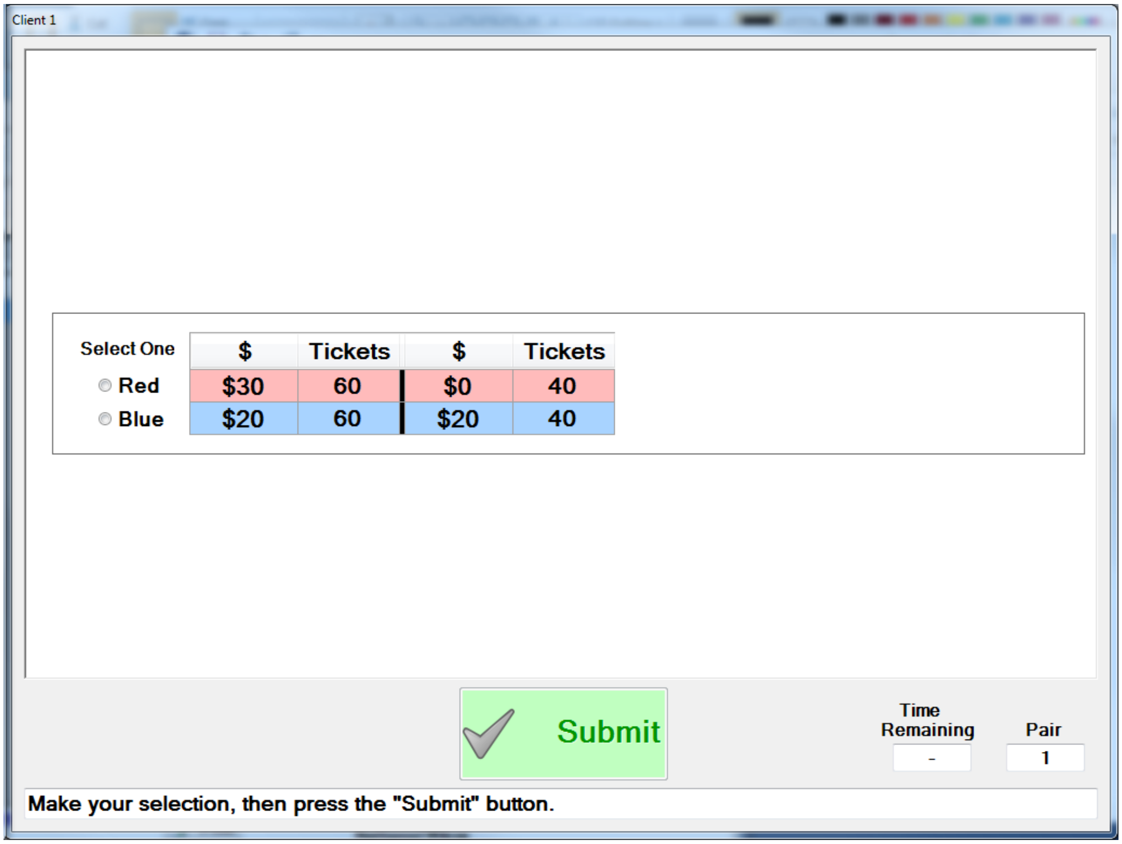
Client 1
Select One
Red
Blue
$
Tickets
$
Tickets
$30
60
$0
40
$20
60
$20
40
Submit
Time Remaining
-
Pair
1
Make your selection, then press the "Submit" button.

Instructions

An Overview (continued)

After you have made all 100 choices, an entry box will appear on your computer screen for entry of one number from one to 100. You will roll a white die and a gray die, each with ten sides, using a dice cup. The number on the white die determines whether the pair chosen for your payoff is from pairs 1 through 10 (if the white die rolls 1), 11 through 20 (if the white die rolls 2), 21 through 30 (if the white die rolls 3) and so on. The number on the gray die determines which of the 10 values in the interval from the white die roll will be used to determine your payoff. For instance, if the white die roll is 6 and the gray die roll is 4, then your payoff will be determined from choice pair 64.

We will enter the number you roll (determined by the white and gray dice) in the entry box on your computer screen, and the computer will then display that pair and the option you chose from it. Only this one option will determine your money outcome.

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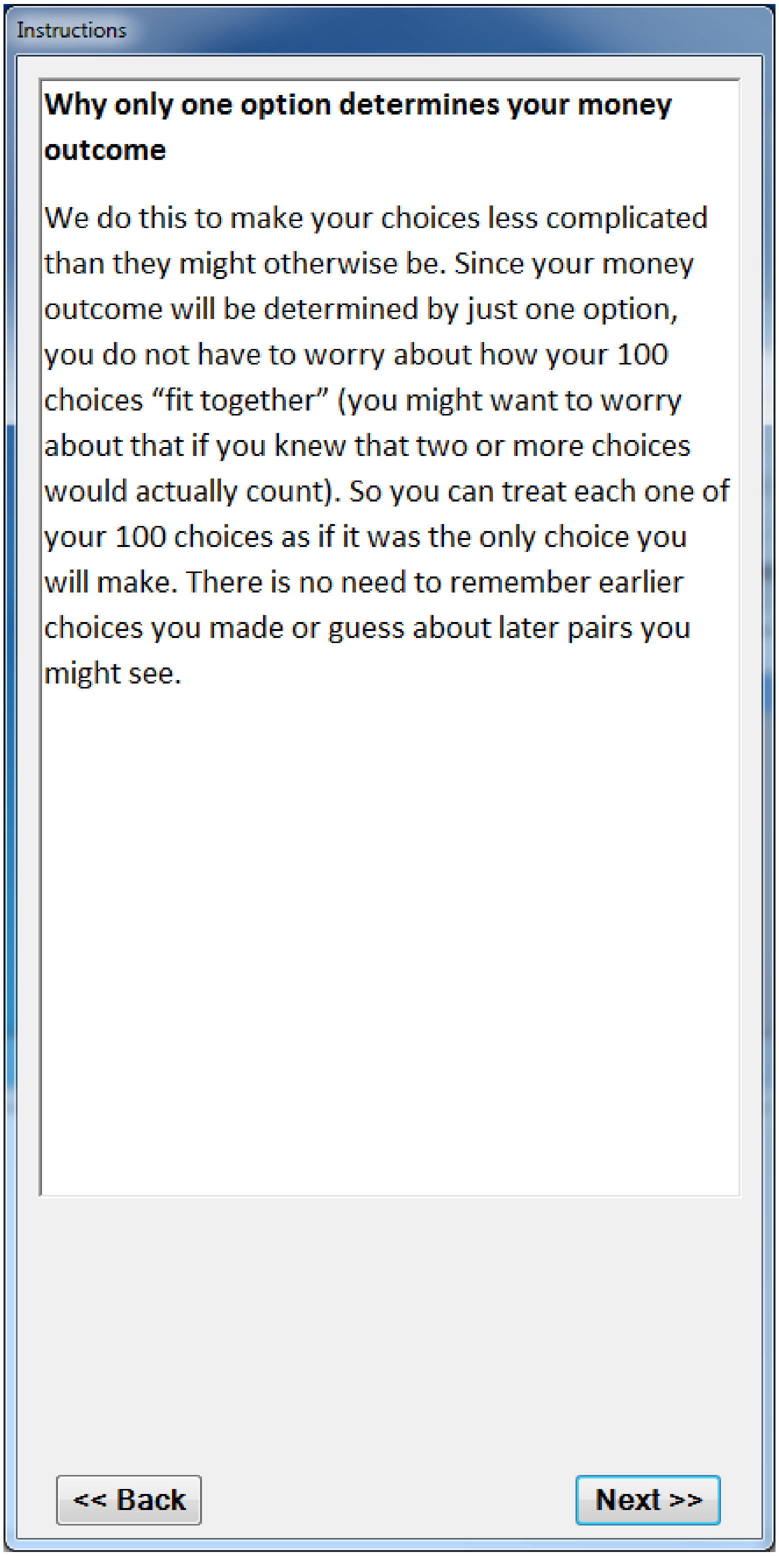
Instructions
Why only one option determines your money outcome
We do this to make your choices less complicated than they might otherwise be. Since your money outcome will be determined by just one option, you do not have to worry about how your 100 choices "fit together" (you might want to worry about that if you knew that two or more choices would actually count). So you can treat each one of your 100 choices as if it was the only choice you will make. There is no need to remember earlier choices you made or guess about later pairs you might see.
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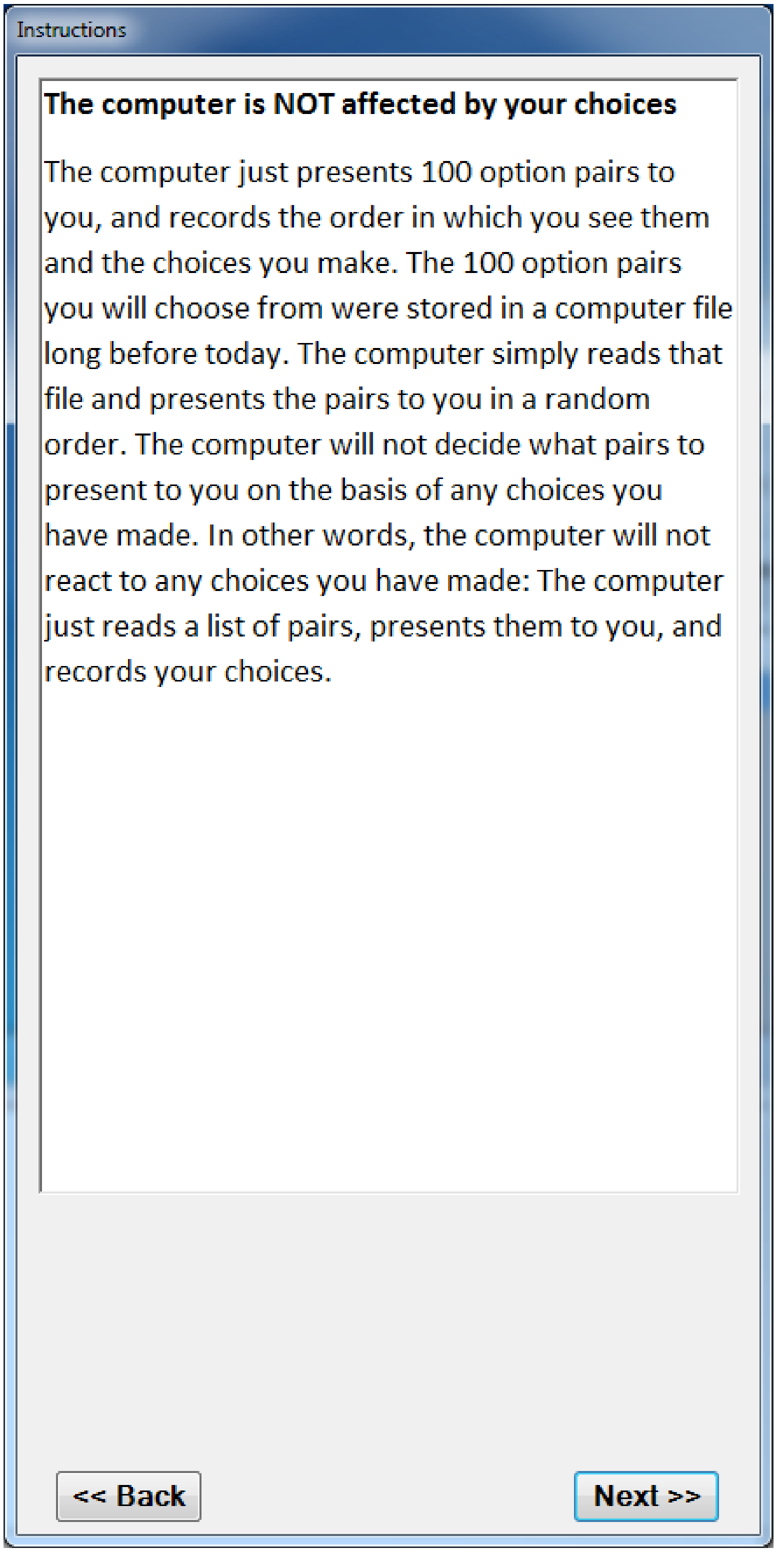
Instructions
The computer is NOT affected by your choices
The computer just presents 100 option pairs to you, and records the order in which you see them and the choices you make. The 100 option pairs you will choose from were stored in a computer file long before today. The computer simply reads that file and presents the pairs to you in a random order. The computer will not decide what pairs to present to you on the basis of any choices you have made. In other words, the computer will not react to any choices you have made: The computer just reads a list of pairs, presents them to you, and records your choices.
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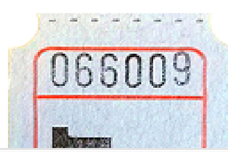
Instructions

A First Example of an Option Pair

The table on the main screen shows an example of an option pair, exactly as it would appear when you are making your choices.

Each option is one row in the table, and the money outcome of both options depends on a chance factor-the draw of a numbered ticket from a bag of tickets. The outcome of the top row option depends on the draw of a ticket from a bag of 100 red tickets numbered from 1 to 100. We call this option “Red” and refer to its ticket bag as the “Red bag.” Similarly, the outcome of the bottom row option depends on the draw of a ticket from a bag of 100 blue tickets numbered from 1 to 100. We call this option “Blue” and refer to its ticket bag as the “Blue bag.” Below is a photo of a blue ticket with the number 9. Notice that we ignore the first three digits of the ticket number: Only the last three digits matter.



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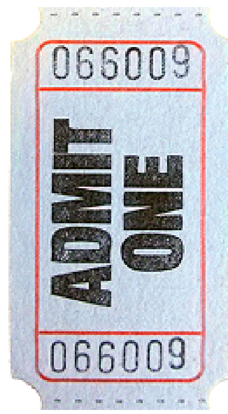
Instructions

three digits matter.



If you chose Red in this option pair, and this option pair determined your outcome at the end of this session, then you would draw a ticket from the Red bag. You would then receive an outcome corresponding to the number on the ticket you draw. Low ticket numbers select the left-most outcome in an option, while high ticket numbers select the right-most outcome in an option. In the Red option in the table below, if you drew a ticket numbered from 1 to 60, you would receive $30. If you drew a ticket numbered from 61 to 100, you would receive $0.

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Instructions

A First Example of an Option Pair (continued)

The table on the main screen still shows the same example of an option pair, exactly as it would appear when you are making your choices.

In this option pair, the Blue option happens to result in a sure money outcome. Notice that in this example, the outcome of the Blue option does not depend on a chance factor: All 100 tickets in the Blue bag result in the outcome $20. If you chose Blue in this option pair, and this pair determined your outcome at the end of this session, you would not need to draw a ticket from the Blue bag. Your outcome would be $20.

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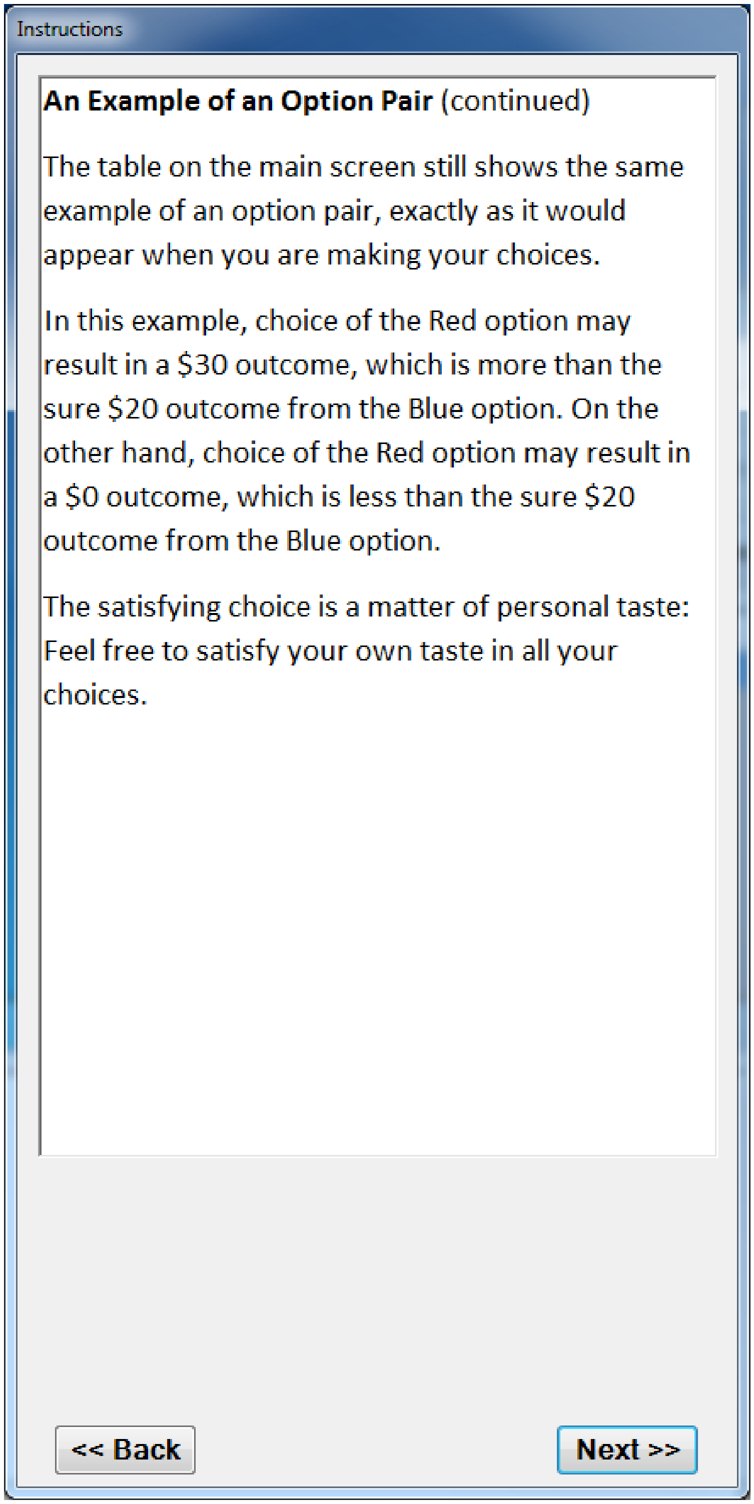
Instructions
An Example of an Option Pair (continued)
The table on the main screen still shows the same example of an option pair, exactly as it would appear when you are making your choices.
In this example, choice of the Red option may result in a $30 outcome, which is more than the sure $20 outcome from the Blue option. On the other hand, choice of the Red option may result in a $0 outcome, which is less than the sure $20 outcome from the Blue option.
The satisfying choice is a matter of personal taste: Feel free to satisfy your own taste in all your choices.
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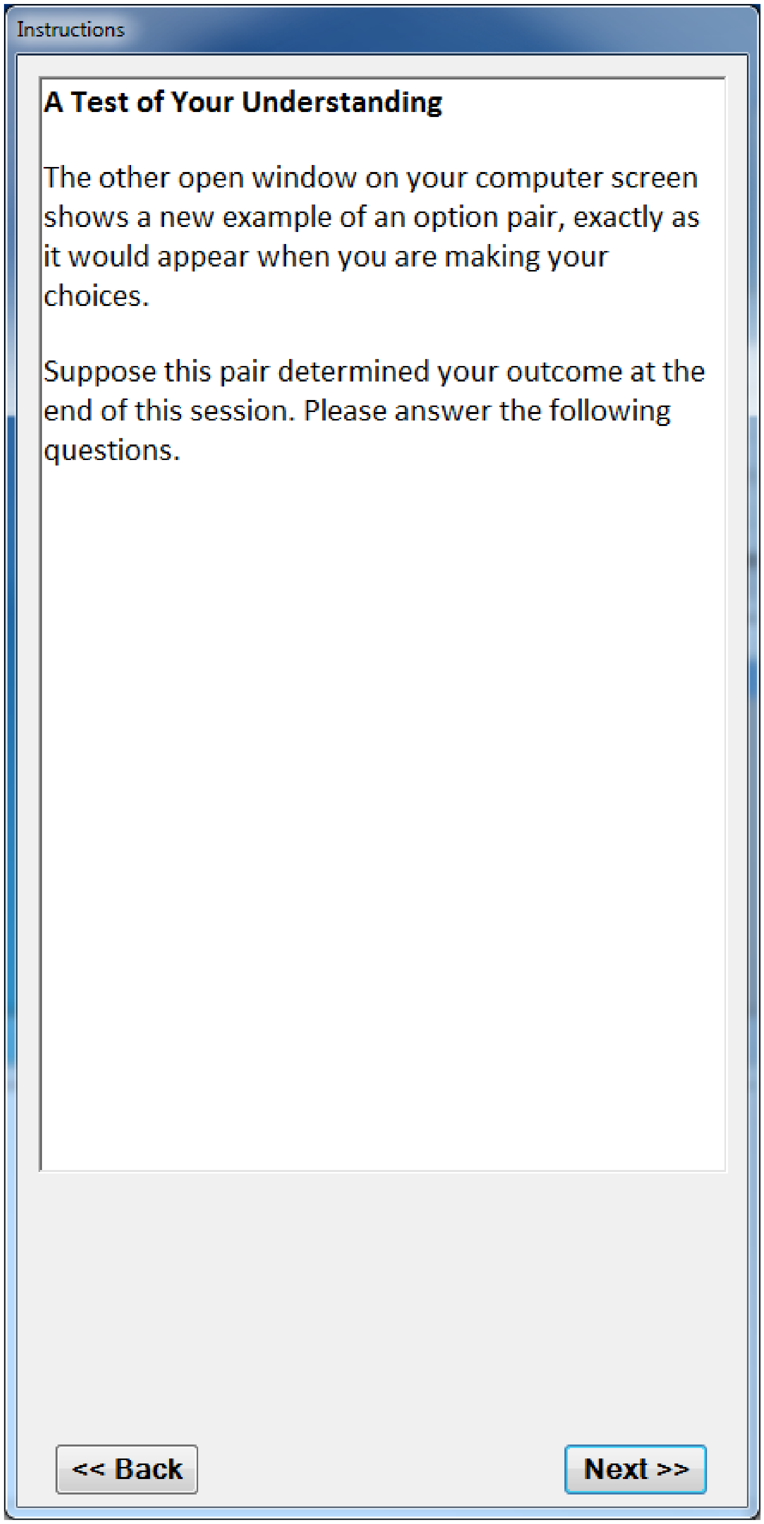
Instructions
A Test of Your Understanding
The other open window on your computer screen shows a new example of an option pair, exactly as it would appear when you are making your choices.
Suppose this pair determined your outcome at the end of this session. Please answer the following questions.
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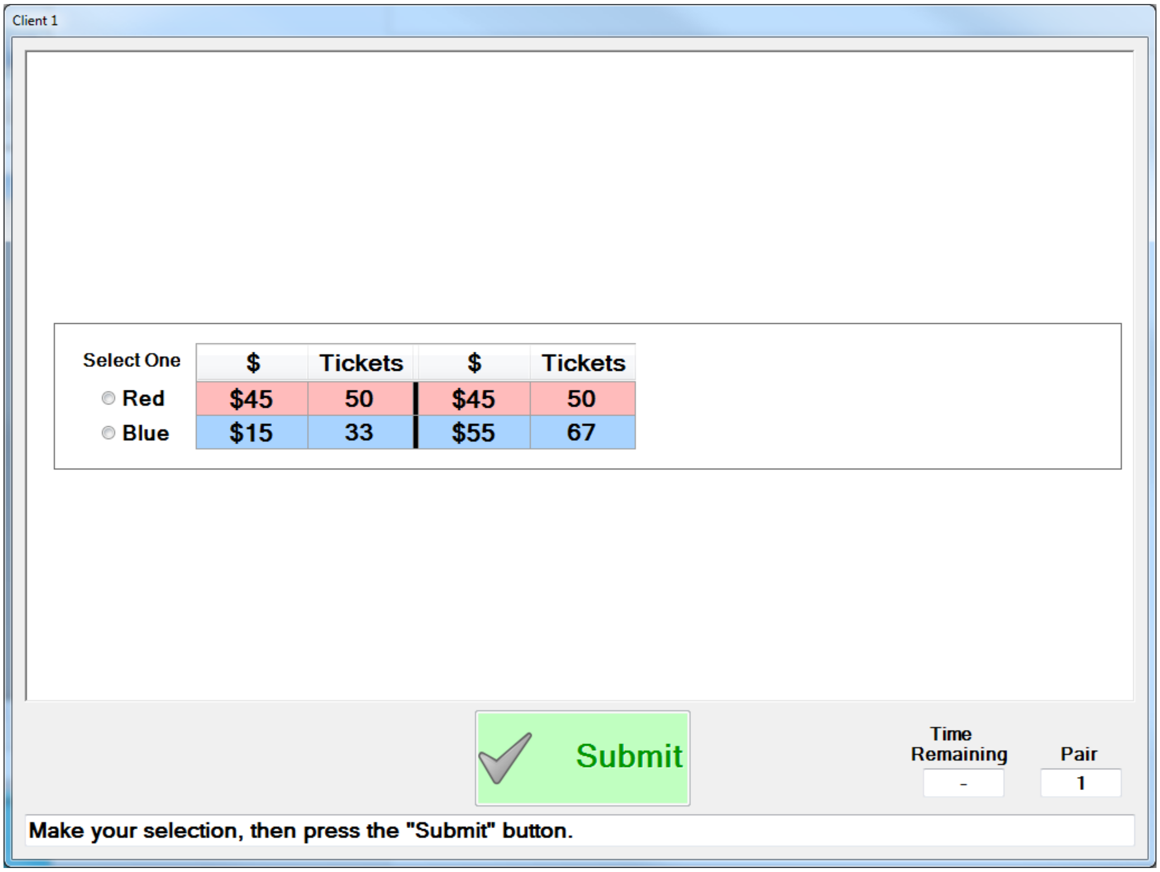
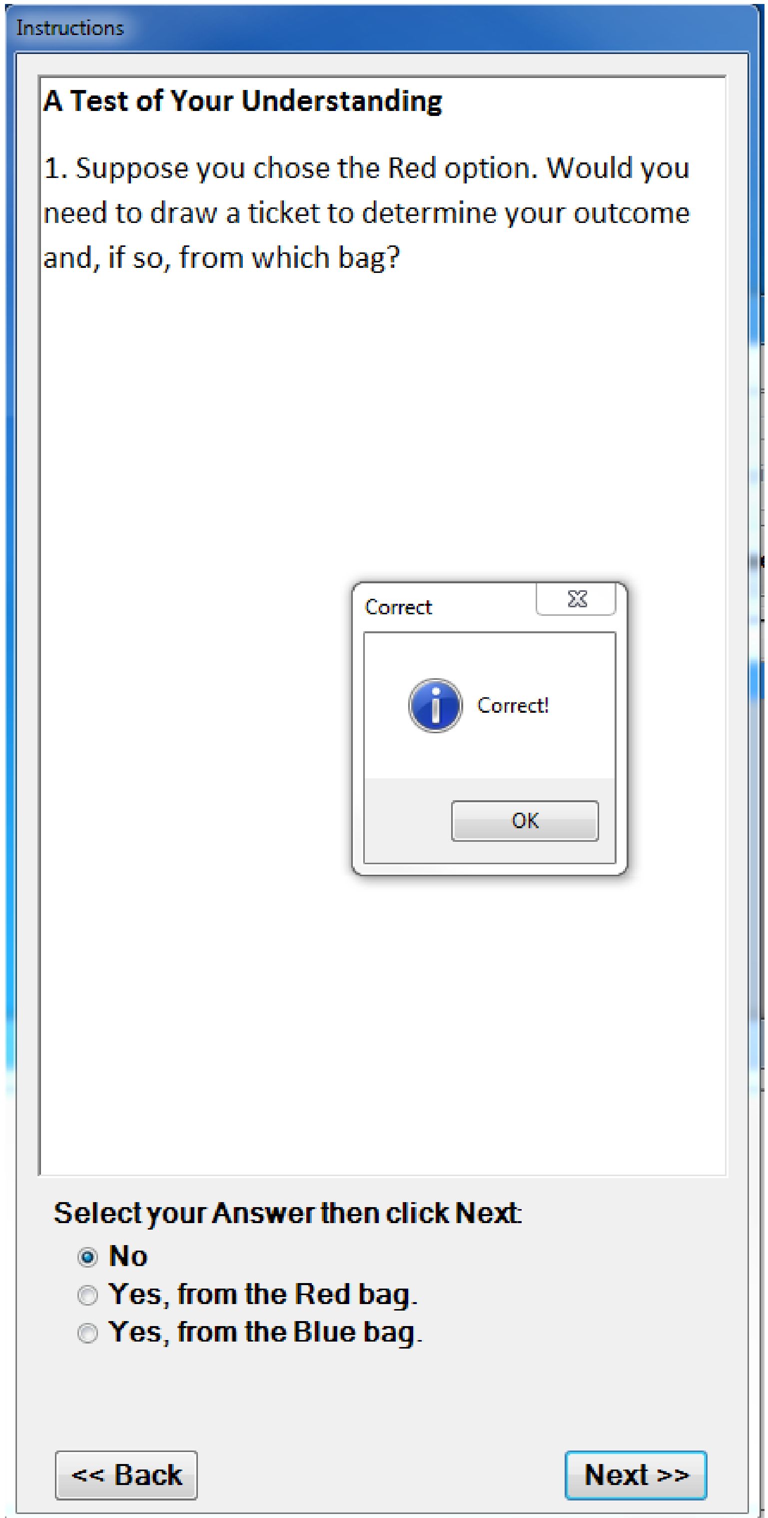


Note: This screen is displayed throughout all questions on the first quiz, below.


Instructions
A Test of Your Understanding
1. Suppose you chose the Red option. Would you need to draw a ticket to determine your outcome and, if so, from which bag?
Correct
Correct!
OK
Select your Answer then click Next:
No
Yes, from the Red bag.
Yes, from the Blue bag.
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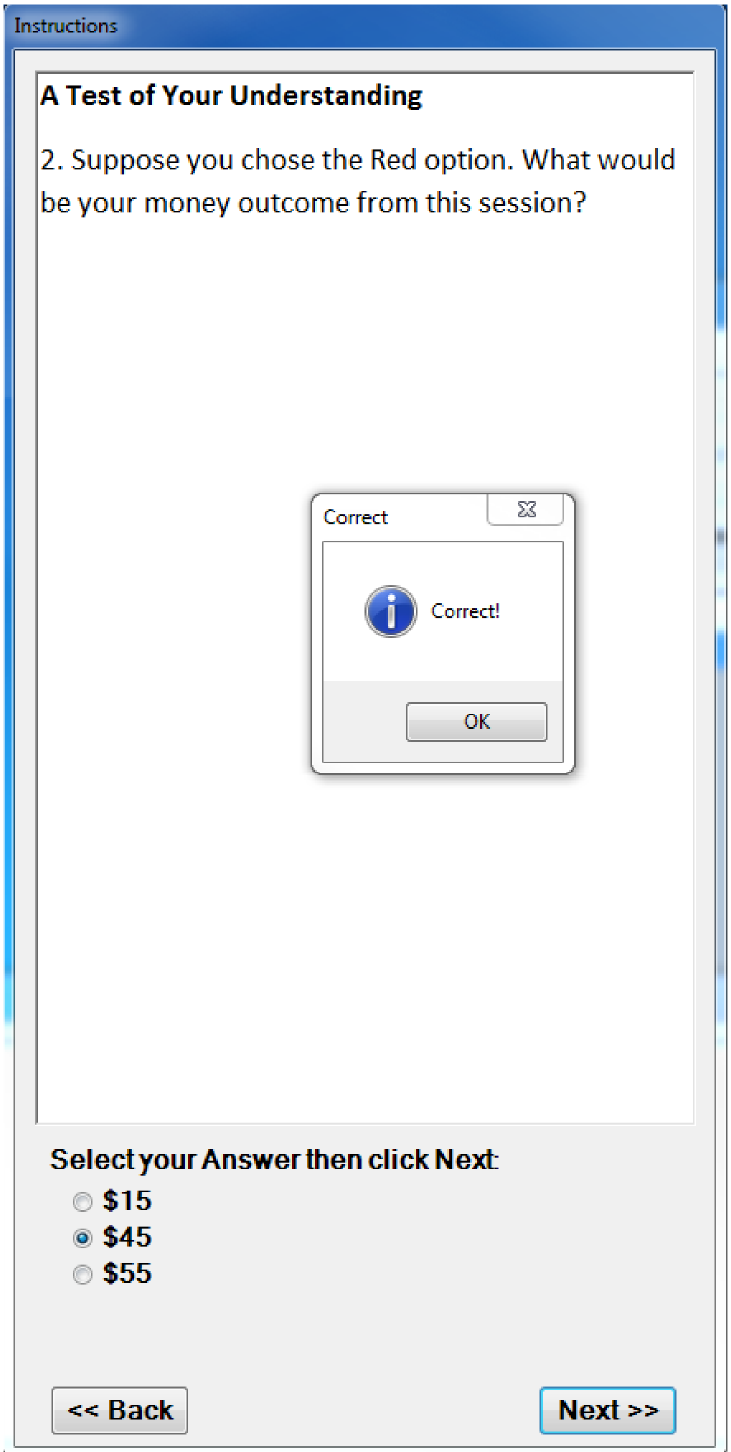
Instructions
A Test of Your Understanding
2. Suppose you chose the Red option. What would be your money outcome from this session?
Correct
Correct!
OK
Select your Answer then click Next:
$15
$45
$55
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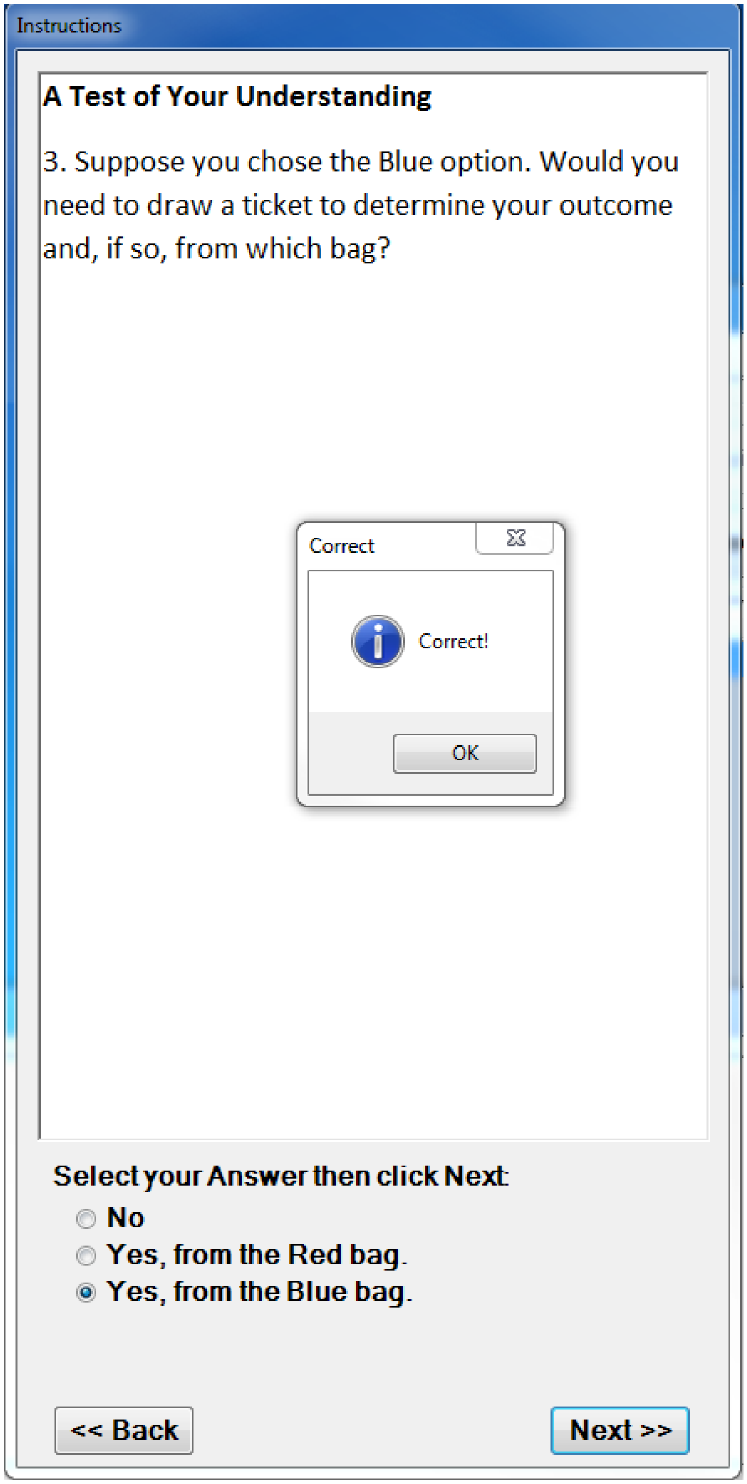
Instructions
A Test of Your Understanding
3. Suppose you chose the Blue option. Would you need to draw a ticket to determine your outcome and, if so, from which bag?
Correct
Correct!
OK
Select your Answer then click Next:
No
Yes, from the Red bag.
Yes, from the Blue bag.
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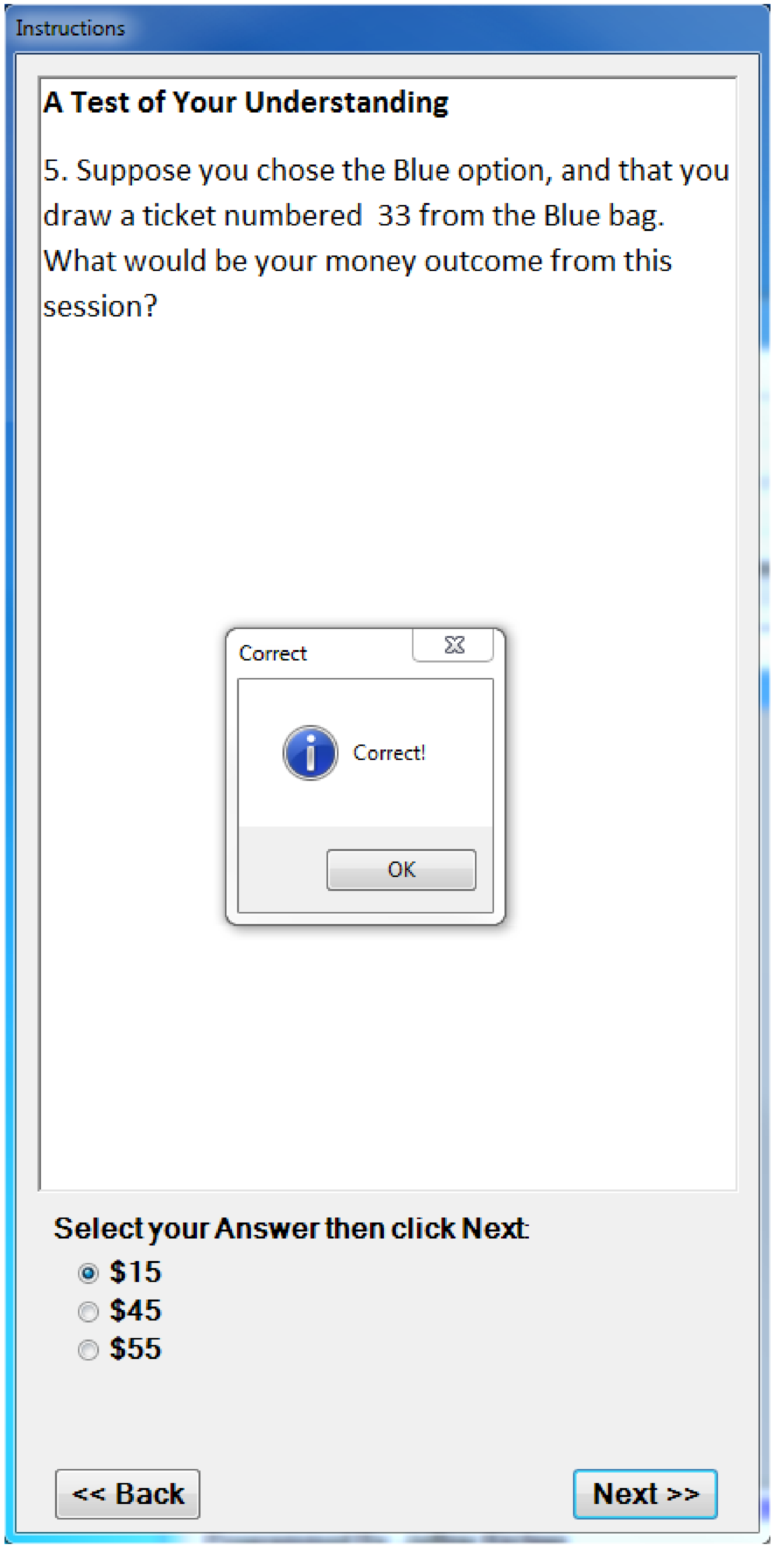
Instructions
A Test of Your Understanding
5. Suppose you chose the Blue option, and that you draw a ticket numbered 33 from the Blue bag. What would be your money outcome from this session?
Correct
Correct!
OK
Select your Answer then click Next:
$15
$45
$55
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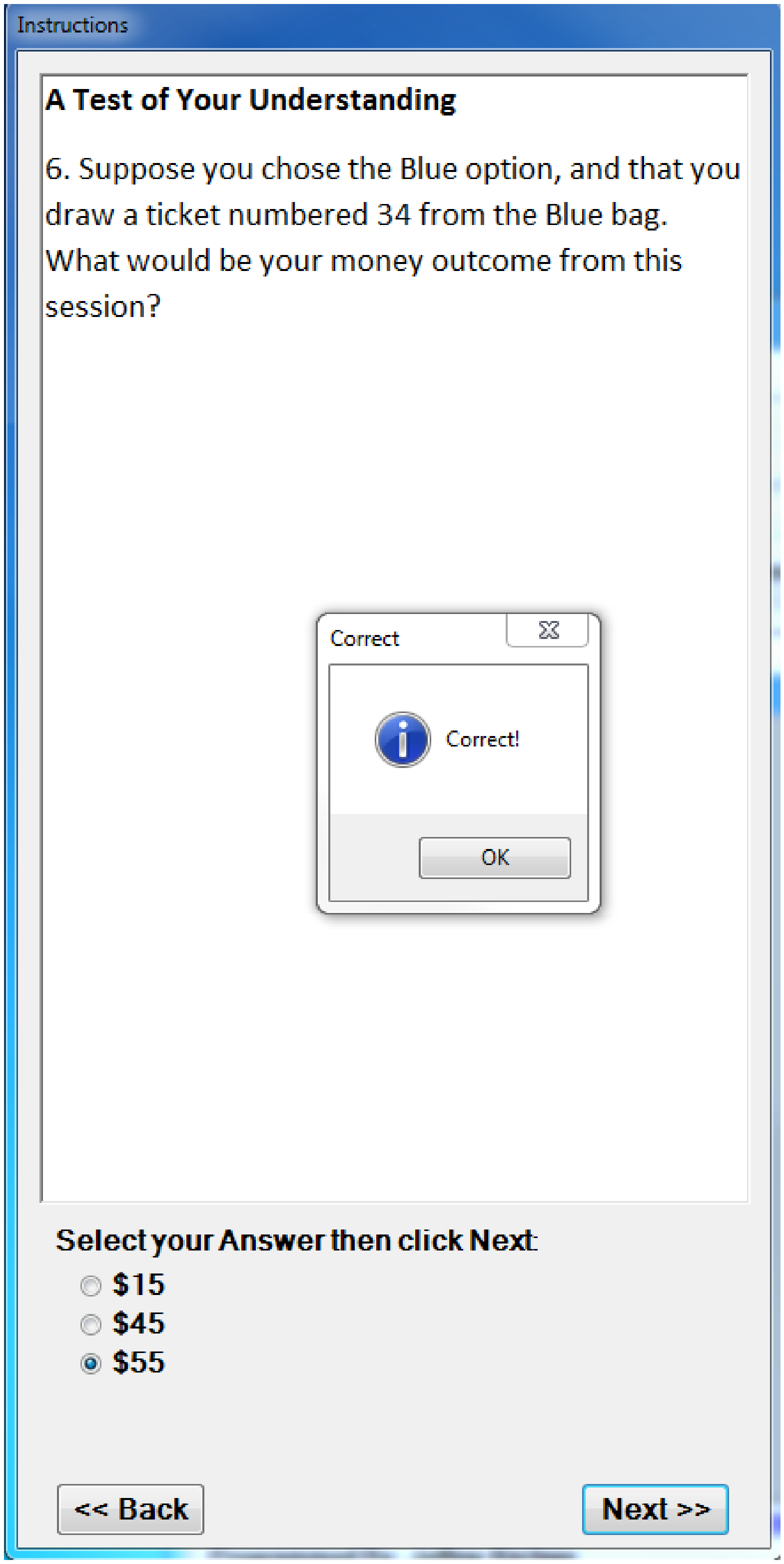
Instructions
A Test of Your Understanding
6. Suppose you chose the Blue option, and that you draw a ticket numbered 34 from the Blue bag. What would be your money outcome from this session?
Correct
Correct!
OK
Select your Answer then click Next:
$15
$45
$55
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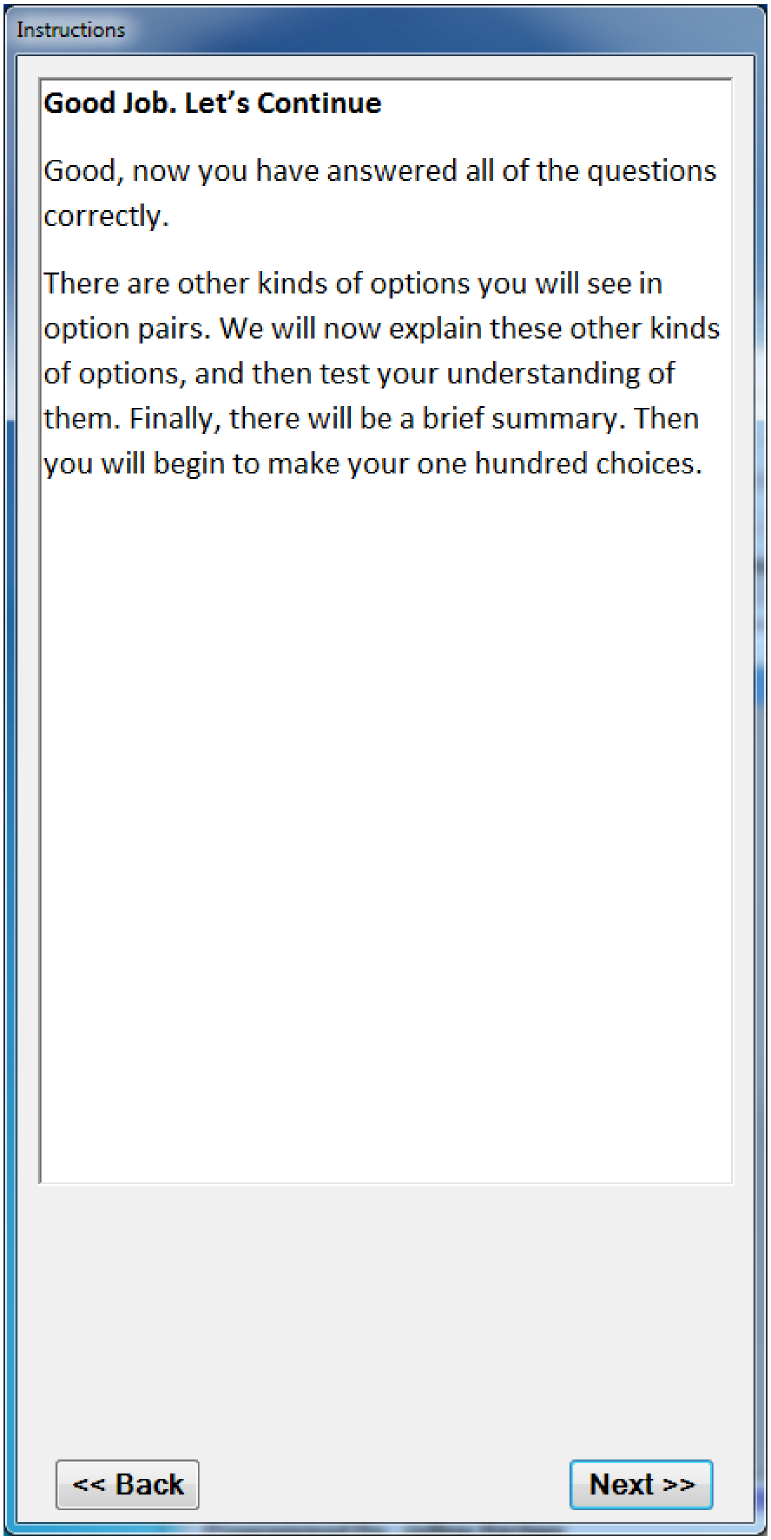
Instructions
Good Job. Let's Continue
Good, now you have answered all of the questions correctly.
There are other kinds of options you will see in option pairs. We will now explain these other kinds of options, and then test your understanding of them. Finally, there will be a brief summary. Then you will begin to make your one hundred choices.
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Instructions

Three- and Four- Outcome Options

In the previous examples of option pairs, you saw sure options and two-outcome options.

There will also be options with three or four possible outcomes. The table on the main screen shows an example of an option pair with a three outcome option, exactly as it would appear when you are making your choices.

Notice that the Red option has three possible money outcomes, $25, $20 and $0. Notice that these three possible outcomes are again connected to the draw of a numbered Red ticket from a bag containing 100 red tickets.

If you chose the Red option in this pair and this pair determined your outcome at the end of this session, you would draw a ticket from the Red bag. If the ticket is any number from 1 through 10, your outcome would be $25. If the ticket is any number from 11 through 99, your outcome would be $20. Finally, if the ticket is number 100, your outcome would be $0.

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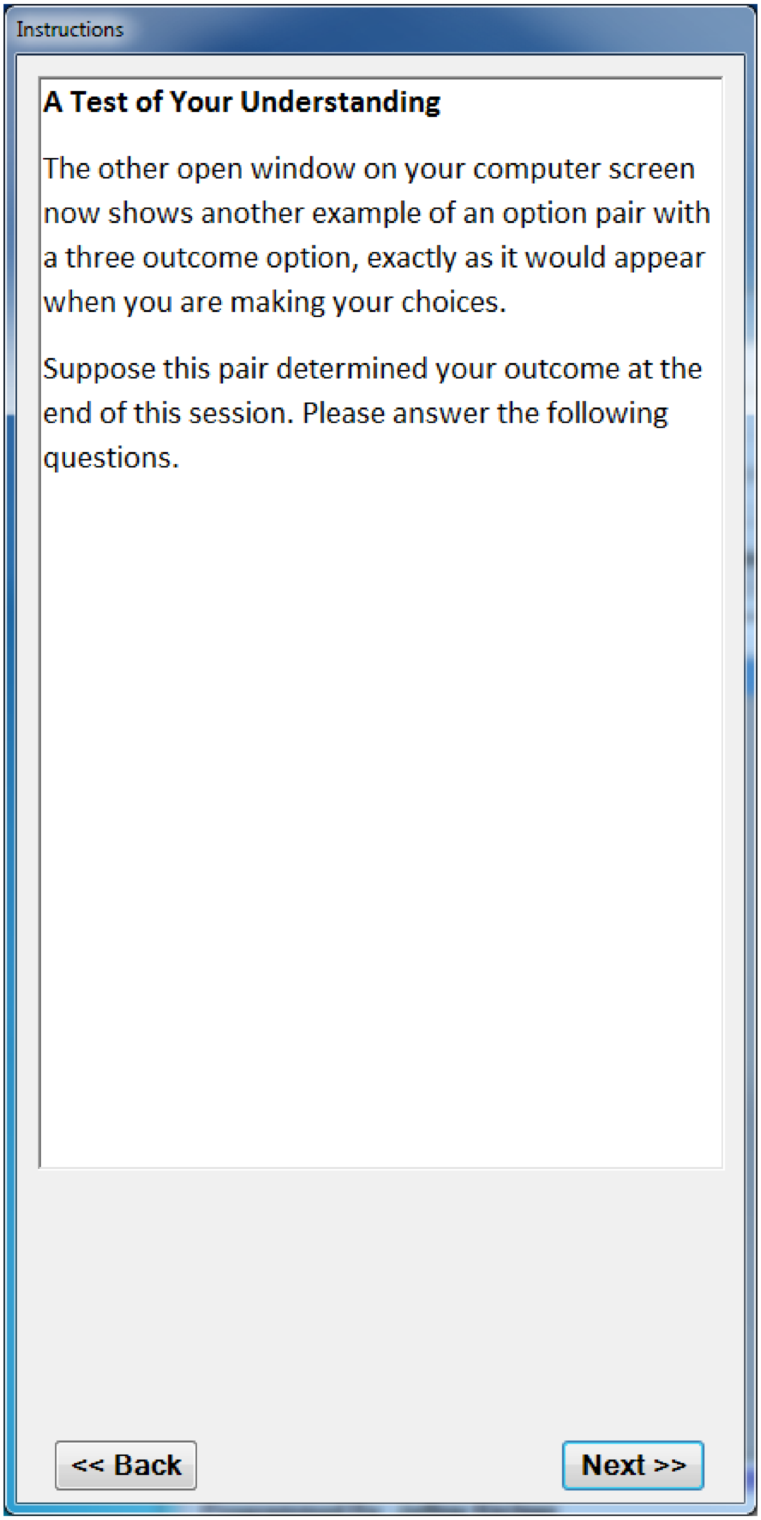
Instructions
A Test of Your Understanding
The other open window on your computer screen now shows another example of an option pair with a three outcome option, exactly as it would appear when you are making your choices.
Suppose this pair determined your outcome at the end of this session. Please answer the following questions.
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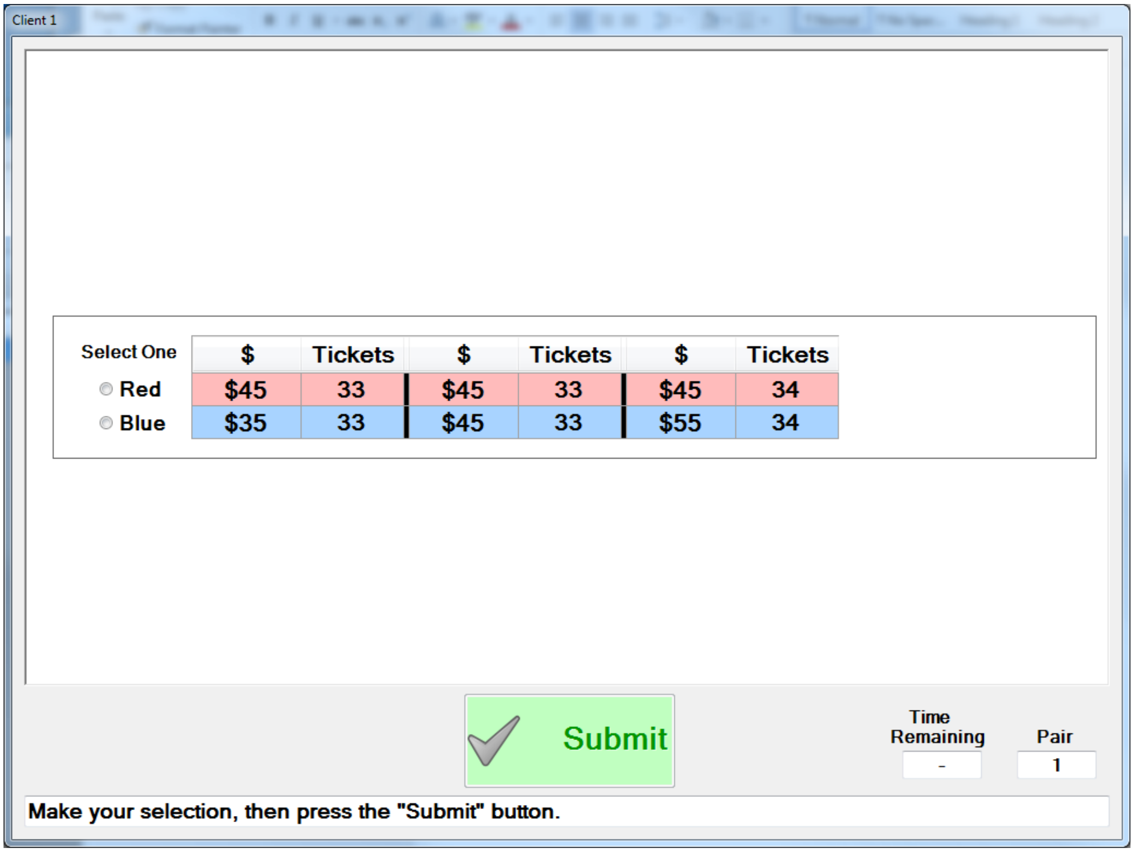
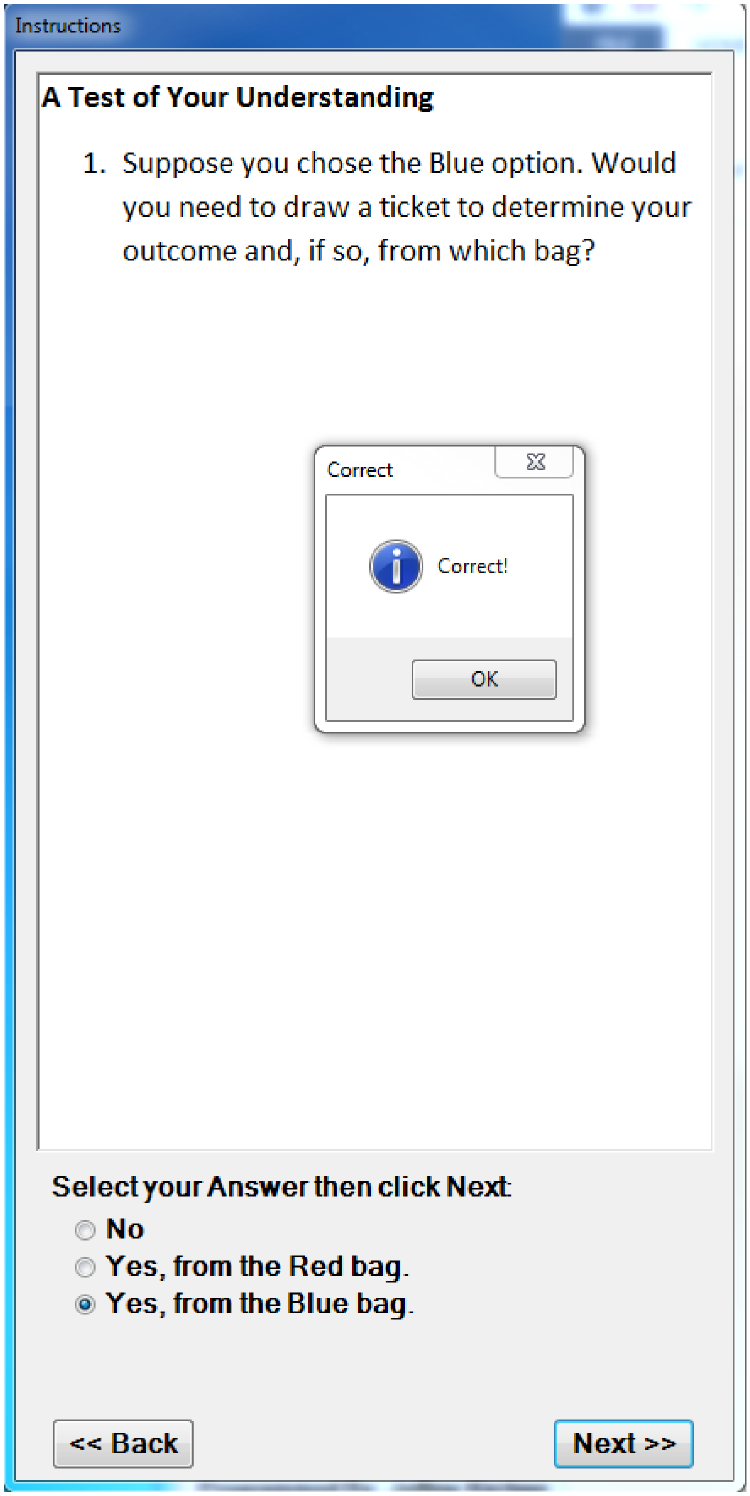


Note: This screen is displayed throughout all questions on the second quiz, below.


Instructions
A Test of Your Understanding
1. Suppose you chose the Blue option. Would you need to draw a ticket to determine your outcome and, if so, from which bag?
Correct
Correct!
OK
Select your Answer then click Next:
No
Yes, from the Red bag.
Yes, from the Blue bag.
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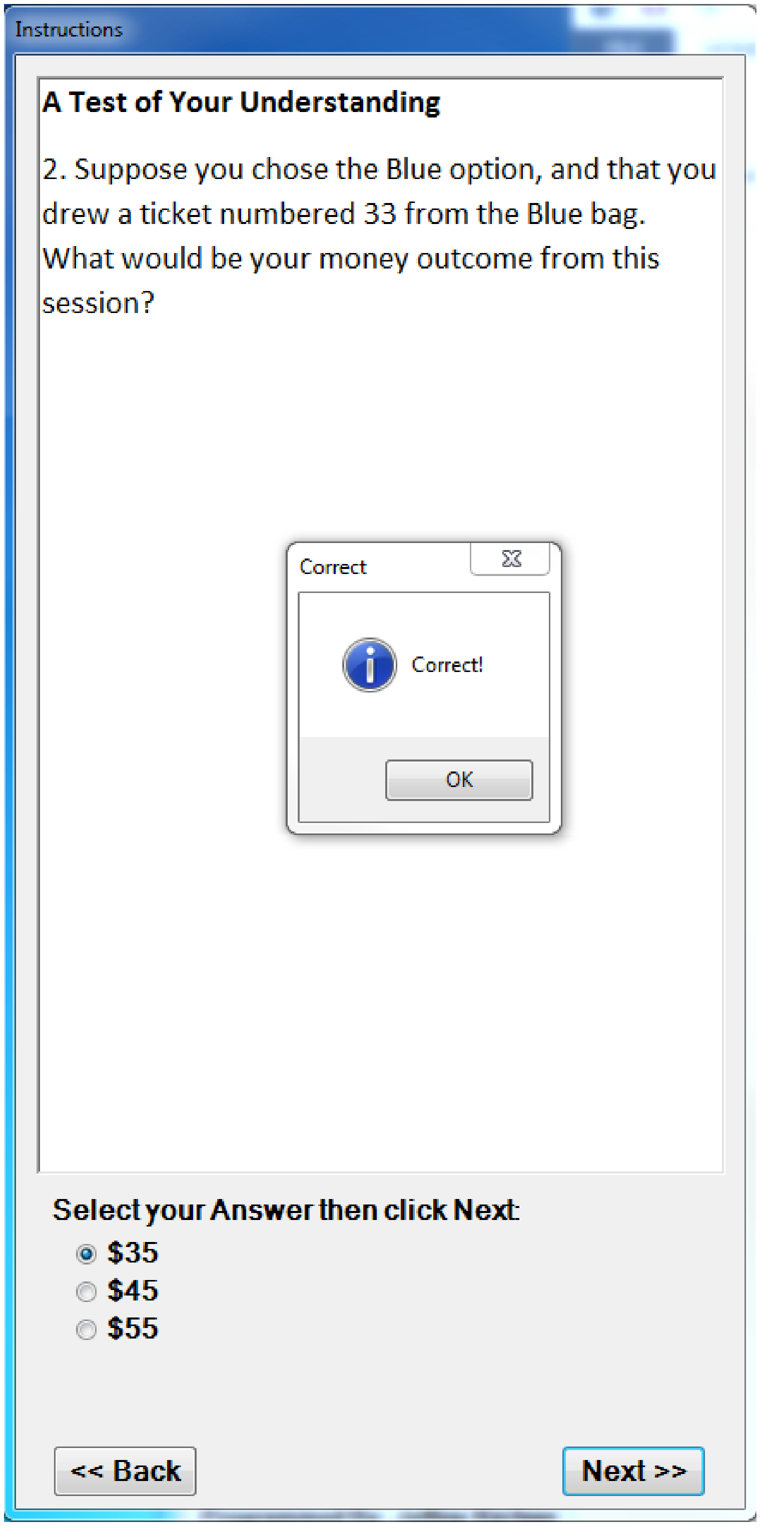
Instructions
A Test of Your Understanding
2. Suppose you chose the Blue option, and that you drew a ticket numbered 33 from the Blue bag. What would be your money outcome from this session?
Correct
Correct!
OK
Select your Answer then click Next:
$35
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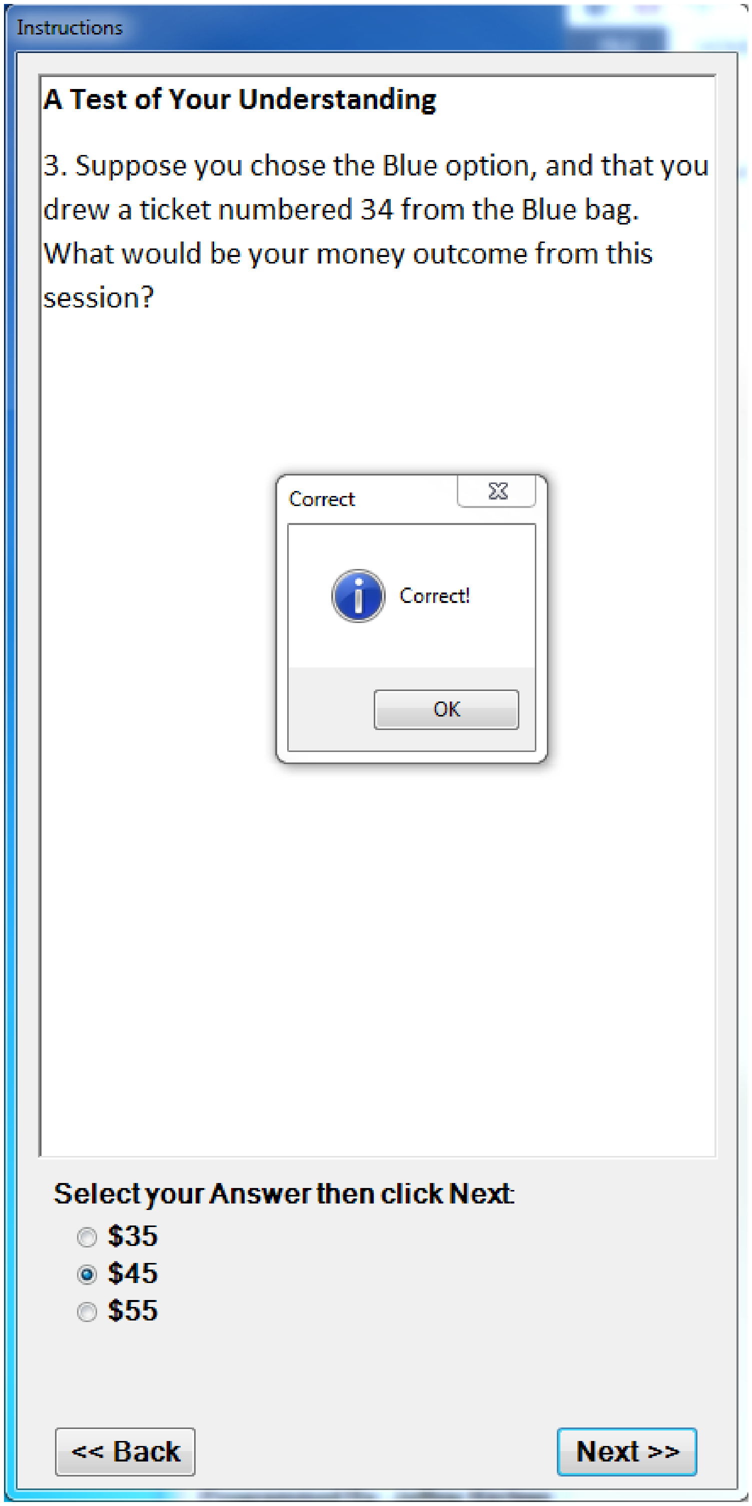
Instructions
A Test of Your Understanding
3. Suppose you chose the Blue option, and that you drew a ticket numbered 34 from the Blue bag. What would be your money outcome from this session?
Correct
Correct!
OK
Select your Answer then click Next
$35
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$55
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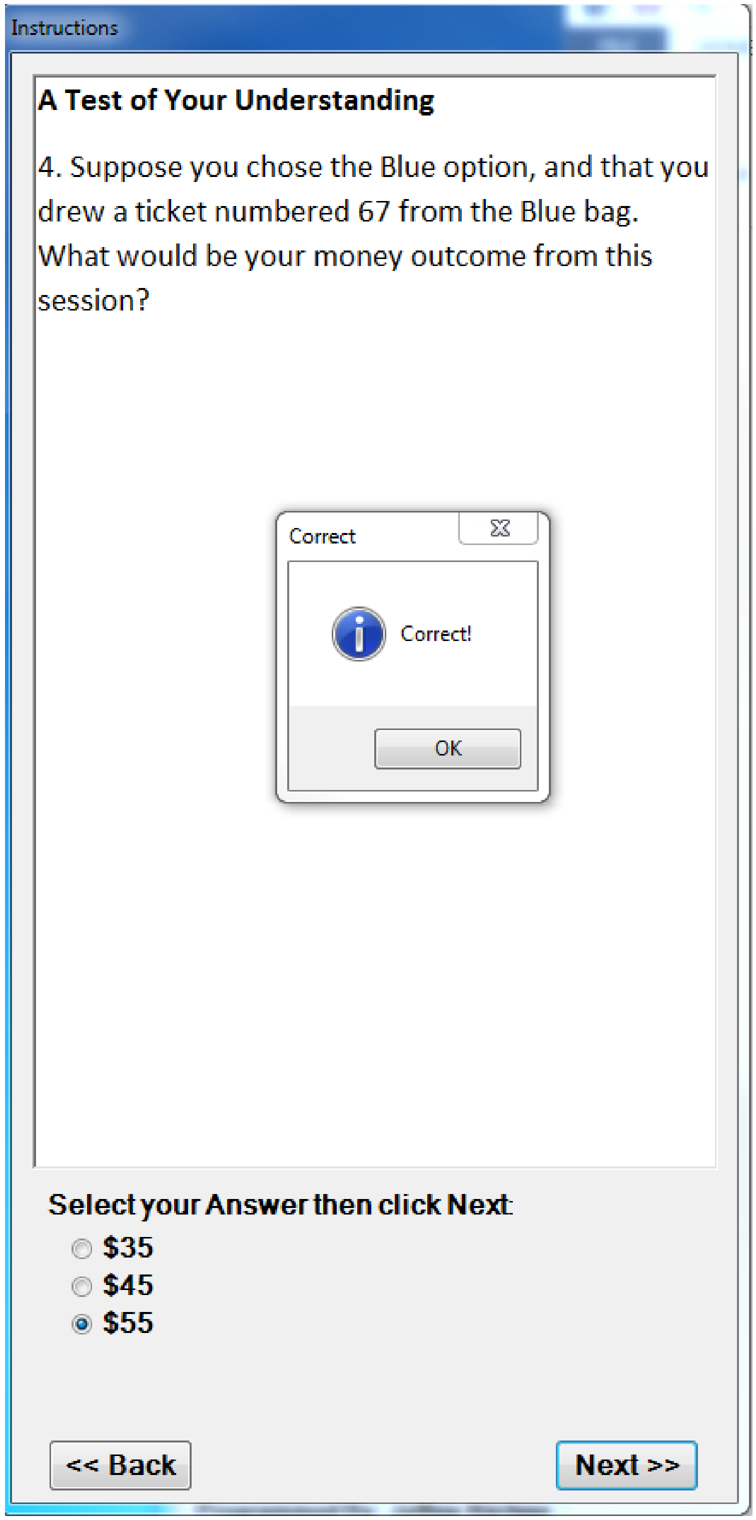
Instructions
A Test of Your Understanding
4. Suppose you chose the Blue option, and that you drew a ticket numbered 67 from the Blue bag. What would be your money outcome from this session?
Correct
Correct!
OK
Select your Answer then click Next:
$35
$45
$55
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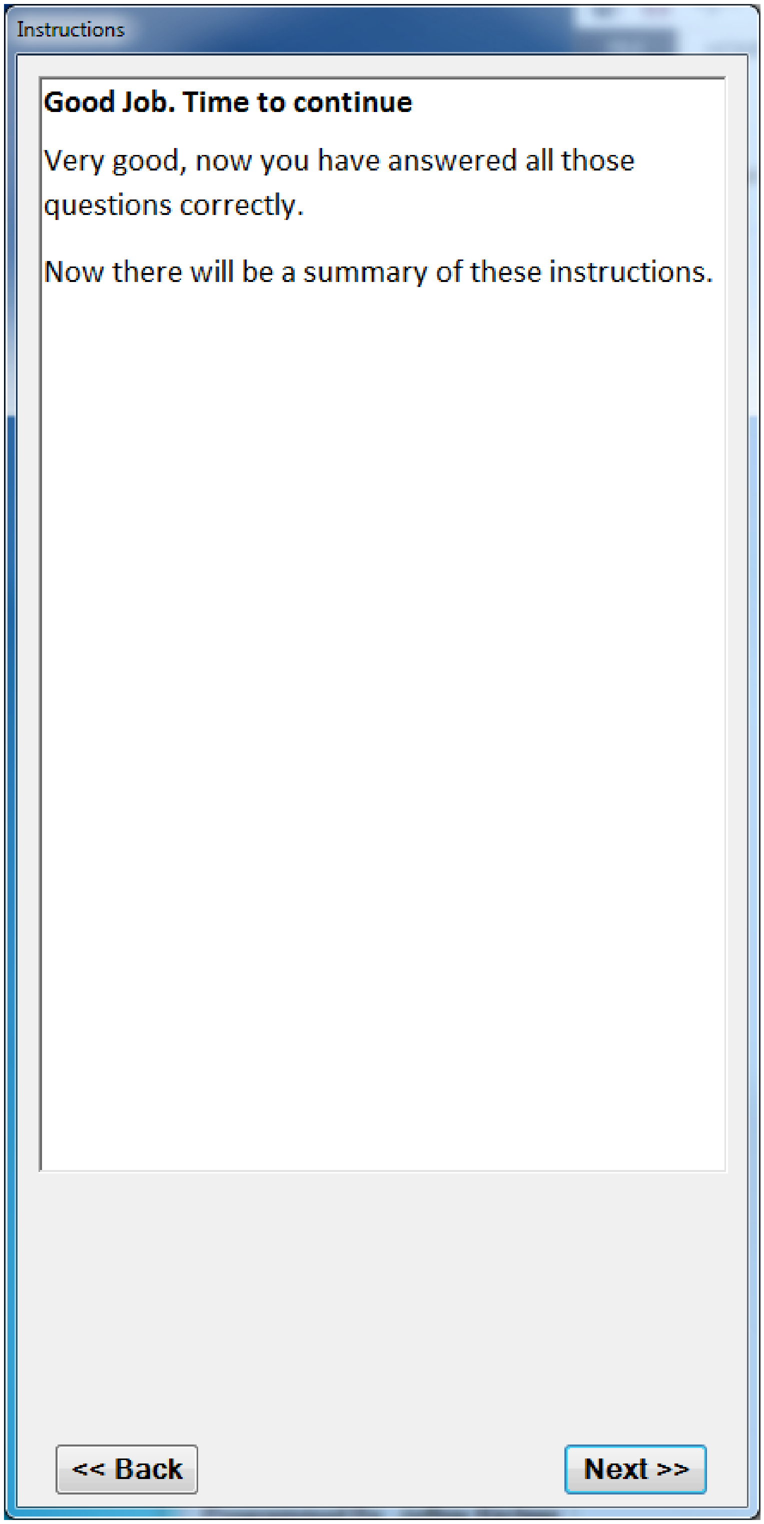
Instructions
Good Job. Time to continue
Very good, now you have answered all those questions correctly.
Now there will be a summary of these instructions.
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Instructions

Summary of Instructions

- You will choose an option from each of 100 pairs of options.
- Just ONE option will determine your money outcome at the end of the session.

Two ten-sided dice will be used to select one of the 100 pairs. You will roll the die and enter that number into your computer. The computer will show that pair, as well as the option you chose from that pair. The option you chose in that pair will determine your outcome.

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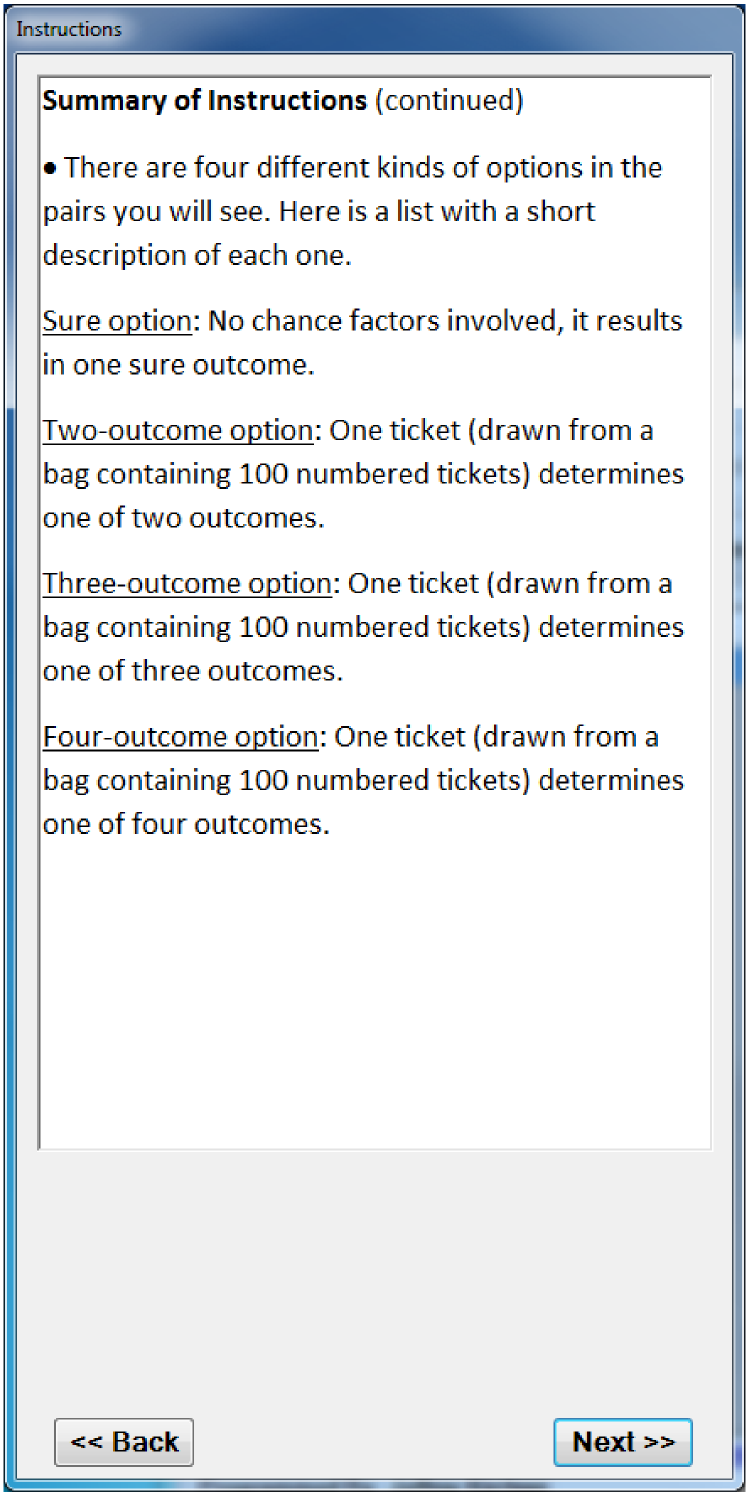
Instructions
Summary of Instructions (continued)
• There are four different kinds of options in the pairs you will see. Here is a list with a short description of each one.
Sure option: No chance factors involved, it results in one sure outcome.
Two-outcome option: One ticket (drawn from a bag containing 100 numbered tickets) determines one of two outcomes.
Three-outcome option: One ticket (drawn from a bag containing 100 numbered tickets) determines one of three outcomes.
Four-outcome option: One ticket (drawn from a bag containing 100 numbered tickets) determines one of four outcomes.
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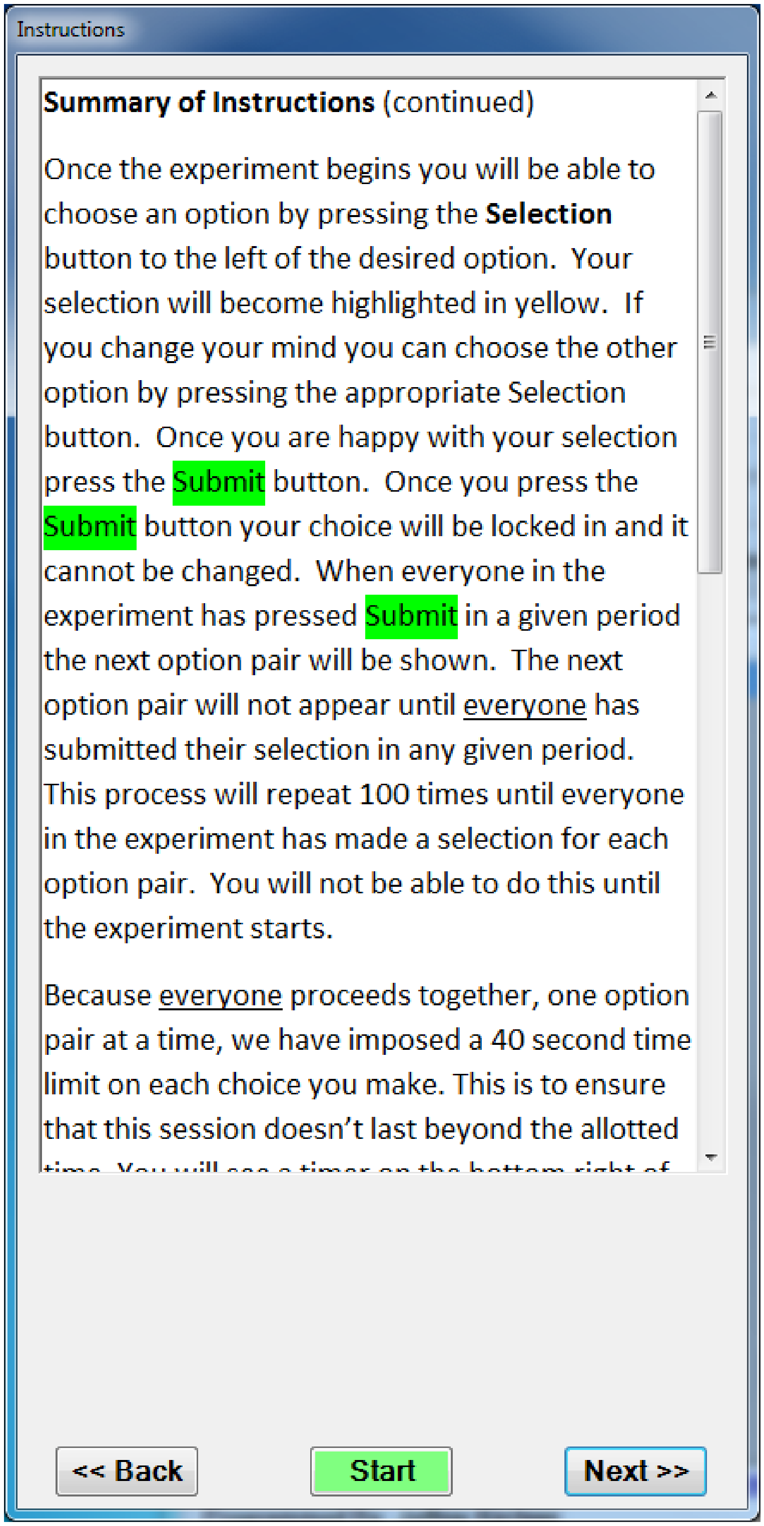
Instructions
Summary of Instructions (continued)
Once the experiment begins you will be able to choose an option by pressing the Selection button to the left of the desired option. Your selection will become highlighted in yellow. If you change your mind you can choose the other option by pressing the appropriate Selection button. Once you are happy with your selection press the Submit button. Once you press the Submit button your choice will be locked in and it cannot be changed. When everyone in the experiment has pressed Submit in a given period the next option pair will be shown. The next option pair will not appear until everyone has submitted their selection in any given period. This process will repeat 100 times until everyone in the experiment has made a selection for each option pair. You will not be able to do this until the experiment starts.
Because everyone proceeds together, one option pair at a time, we have imposed a 40 second time limit on each choice you make. This is to ensure that this session doesn't last beyond the allotted
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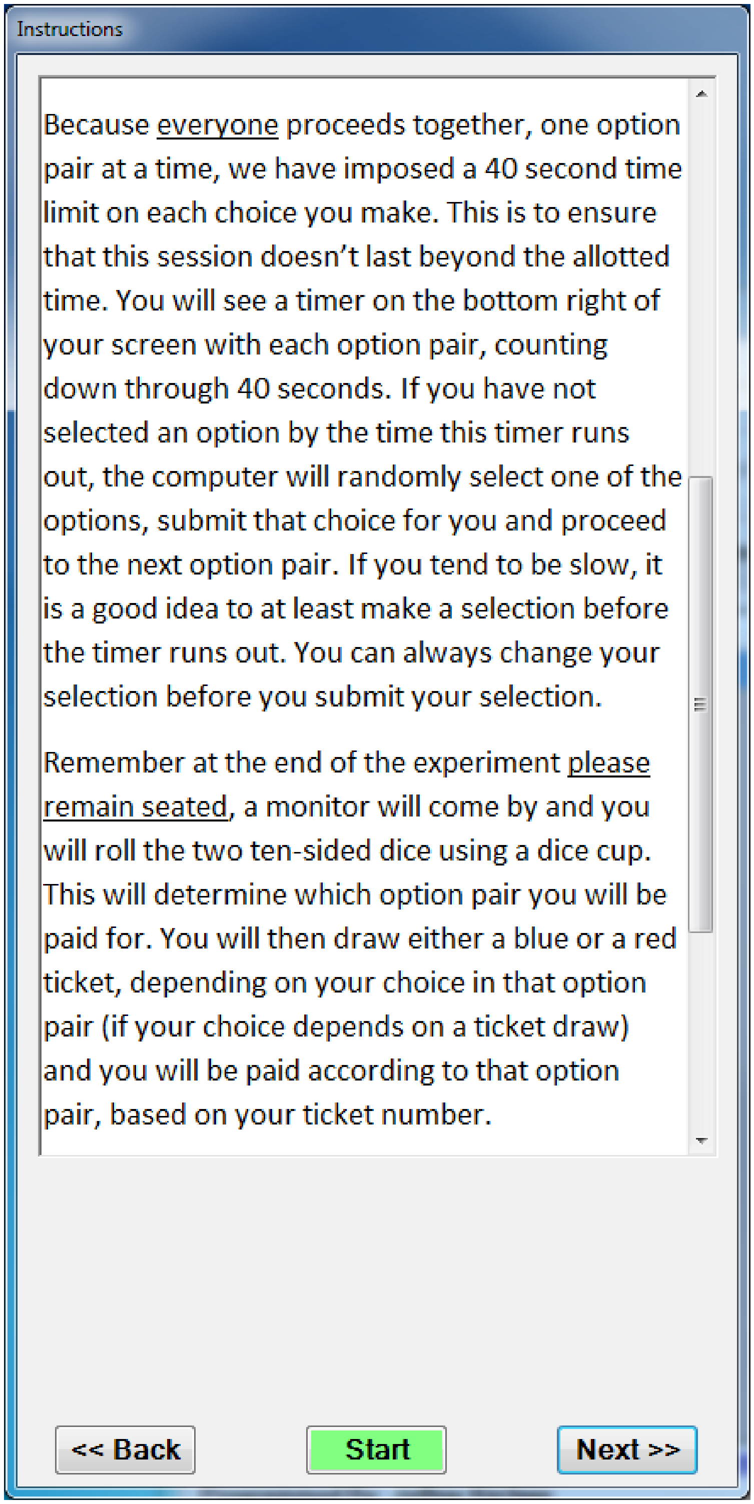
Instructions
Because everyone proceeds together, one option pair at a time, we have imposed a 40 second time limit on each choice you make. This is to ensure that this session doesn't last beyond the allotted time. You will see a timer on the bottom right of your screen with each option pair, counting down through 40 seconds. If you have not selected an option by the time this timer runs out, the computer will randomly select one of the options, submit that choice for you and proceed to the next option pair. If you tend to be slow, it is a good idea to at least make a selection before the timer runs out. You can always change your selection before you submit your selection.
Remember at the end of the experiment please remain seated, a monitor will come by and you will roll the two ten-sided dice using a dice cup. This will determine which option pair you will be paid for. You will then draw either a blue or a red ticket, depending on your choice in that option pair (if your choice depends on a ticket draw) and you will be paid according to that option pair, based on your ticket number.
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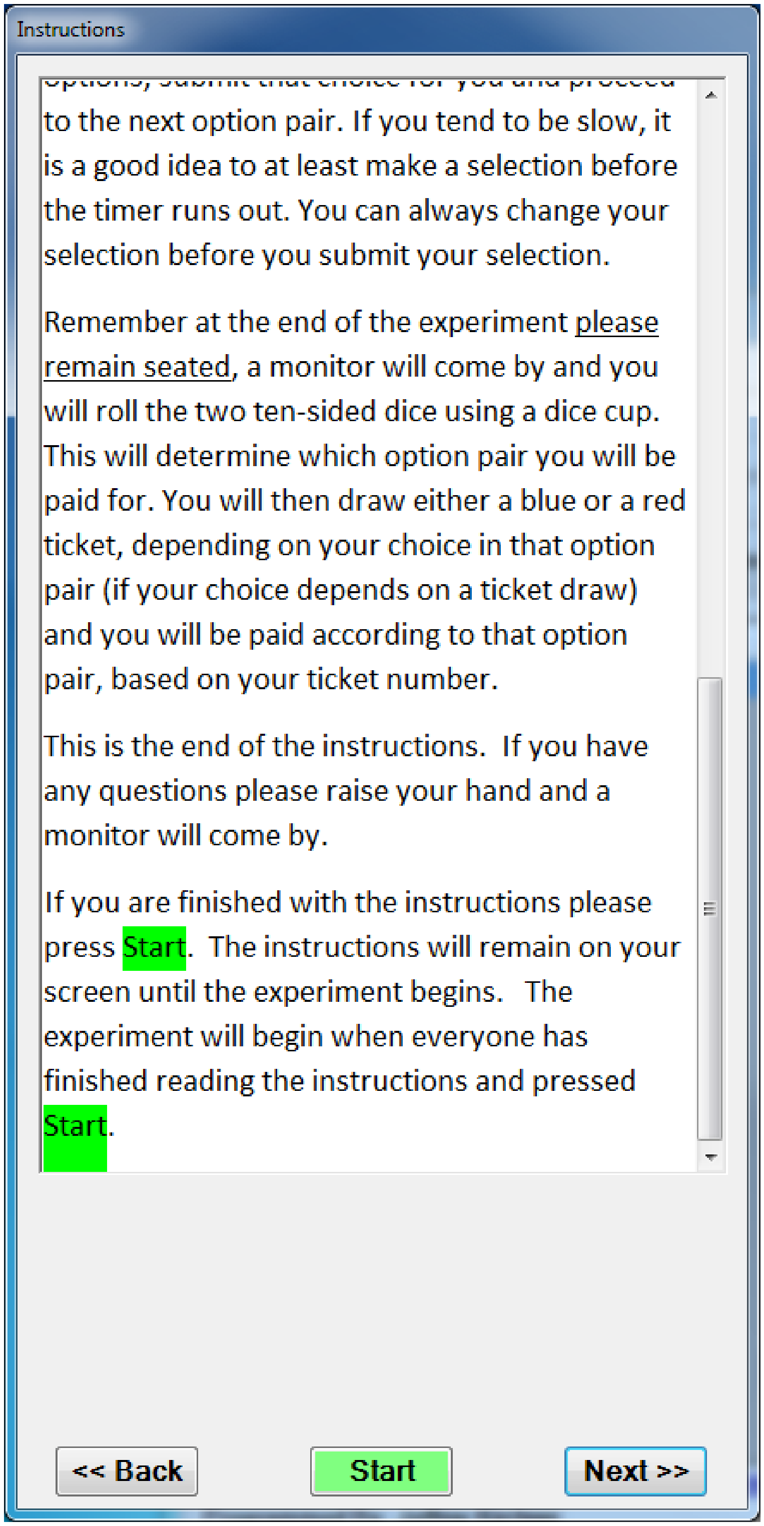
Instructions
to the next option pair. If you tend to be slow, it is a good idea to at least make a selection before the timer runs out. You can always change your selection before you submit your selection.
Remember at the end of the experiment please remain seated, a monitor will come by and you will roll the two ten-sided dice using a dice cup. This will determine which option pair you will be paid for. You will then draw either a blue or a red ticket, depending on your choice in that option pair (if your choice depends on a ticket draw) and you will be paid according to that option pair, based on your ticket number.
This is the end of the instructions. If you have any questions please raise your hand and a monitor will come by.
If you are finished with the instructions please press Start. The instructions will remain on your screen until the experiment begins. The experiment will begin when everyone has finished reading the instructions and pressed Start.
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