Supplementary Material - Experimental Design 1

Page 1. Experimental Flow

Page 2. General Treatment information

Page 3-7. Skew Treatment Description and Full data on the Lottery Distributions

Page 8-32. Screen Images from the Computer Program Used to Run the Experiments

This material describes the treatments in detail, provides the full data on the lottery distributions, and selected screen images from the computer program used to run the experiments.

Experimental Flow

The experiments flow as follows. Students were enlisted by posters at the University of Waterloo. Using posters we recruited 148 students at the University of Waterloo during the Spring of 2008. They were scheduled to participate in the experiment at certain posted dates and times. The students were randomly allocated across 10 treatments in six pre-determined treatment sequences as outlined in Table 2 in the paper. Each of the sequences in the table was performed by at least 24 subjects. After a brief introduction by the experimenter, the students log on to a web page while in a controlled experimental lab situation. Between four to 15 students were in the room simultaneously. The subjects are first given an introductory page which they must accept before continuing, then a general instructions page, then a knowledge test of the general instructions that they must pass, then they complete the treatments, each treatment having a specific set of instructions, the lottery prize is drawn randomly, then they complete the demographics survey and get paid the drawn prize plus a $5 participation fee by the experimenter.

The executive sample was recruited among participants in a one-week executive campus program at HEC Paris in the summer of 2009. Participation was voluntary and the experiment was executed with pencil and paper. The bulk of participants conducted the experiment either in one of two teaching sessions, and a few additional one-at-a-time at a small table outside a plenary hall after a plenary session. The executives did not take a knowledge test. The participation fee was €5.

General Treatment information

Summary of treatments: There are 10 different treatments.

T1: Tabular display of Holt and Laury's (HL) low-payoff treatment.
T2: Graphical display of HL low-payoff treatment.
T3: Tabular display of HL low-payoff treatment plus $1.00.
T4: Graphical display of HL low-payoff treatment plus $1.00.
T5L: Graphical display zero skew.
T5H: Graphical display zero skew 20x (high payoff).
T6 L: Graphical display moderate skew.
T6 H: Graphical display moderate skew 20x (high payoff).
T7L: Graphical display maximum skew.
T7H: Graphical display maximum skew 20x (high payoff).

Number of student subjects: 144 scheduled undergraduate students from the University of Waterloo. There were 4 additional unscheduled students that arrived to the sessions. The additional 4 students were randomly allocated one treatment sequences.

Number of executive subjects: 131 executive students at HEC Paris.

General approach to ordering.

There are 3 basic treatment sequences:

1) Some subjects do 1 set of "Holt and Laury" choices (tabular display, tabular display+$1, graphical display, or graphical display+$1) followed by 3 sets of low stakes choices (zero, intermediate and high skew). After all choices are made, we draw one of the 4 sets of choices and then we draw a prize from that set plus a $5 participation fee.

2) Other subjects do 3 sets of high stakes choices (zero, intermediate and high skew). We draw one of the three sets of high stakes choices, draw prizes, and finally they receive the prize plus a $5 participation fee.

3) Among the students, 25 subjects do 3 sets of low stakes choices (zero, intermediate and high skew). After that subjects are given the option between (A) drawing one of the three sets of low stakes choices, draw prizes, receive the prize and finish the experiment versus or (B) not drawing a prize for low stakes and moving on to the high stakes choices. If subjects choose option (B) then they will do the three sets of high stakes choices (zero, intermediate and high skew), draw one of the three sets of high stakes choices, draw prizes, and finally receive the prize. 23 subjects opted to give up their low stakes choices. The executives were not exposed to this sequence.

This design follows Harrison, Johnson, McInnes and Rutstrom (2005) methodology to fix the order effect problem that is present in Holt and Laury's design.[1] It allows the researcher to recover choices in the high stakes game that takes place after a low stakes game, but without wealth effects as subjects have to give up the possibility of making their initial earnings to play the second part with high stakes.

[1] Harrison, Glenn W.; Johnson, Eric; McInnes, Melayne M., and Rutström, E. Elisabet, "Risk Aversion and Incentive Effects: Comment," *American Economic Review*, 95(3), June 2005, 897-901.

Skew Treatment Description and Full data on the Lottery Distributions

Our methodology is based on Holt and Laury's (2002) [hereon HL] study of the trade-off between risk and return and avoids the willingness to pay / willingness to accept biases of certainty equivalent and auction methods. In HL, subjects are given the choice between the pairs of lotteries displayed in Table 1 in the paper.

It is expected that subjects start by choosing the safe lottery (S) in the top row as it has both higher expected value and lower variance. As one proceeds down the table, the expected values of both lotteries increases, but the expected value of the risky (R) lottery increases more. When the probability of the high-payoff ticket in the R choice increases enough (moving down the table), a person should cross over to choose R.

Different persons will switch at different points, the switching point being determined by the degree of risk aversion. For example, a risk-neutral person would choose S four times before switching to R. Even the most risk-averse person should switch over by decision 10 in the bottom row, since R then yields a sure payoff of $3.85.

We generalize HL's method to elicit attitudes towards risk and skew. Our design departs from HL's in four main aspects. First, we use the outcome scale rather than the probability scale to allow for violations of EUT due to probability distortion. Second, we consider lotteries that can have from two to ten different prizes. Increasing the number of prizes allows us to control for the mean, variance, and skew of the sequences of lotteries. Third, lotteries are presented in a graphical display rather than in a table. Fourth, we consider three skew treatments. In the first treatment the safe and risky lotteries have symmetric prize distributions. We call this treatment the “zero skew” condition. In the second treatment – “moderate skew” -- the safe lotteries are symmetric and the risky lotteries all have skew equal to 1.69. In the third treatment – “maximum skew” -- the safe lotteries are symmetric and the risky lotteries all have skew equal to 2.67.

Figure 1 in the paper shows our graphical representation for the first choice between S (Safe) and R (Risky) in HL's lotteries. Each of the lines in HL's table is depicted in two graphs of the kind in Figure 1. People are presented with the 10 choices in sequence and are provided with a review section where any decision may be revisited.

The full details on the prize distributions follow in this appendix. Table “Appendix Table 1” contains three panels of tables displaying the prize distributions of T1/T2 (these distributions are exactly the same, they differ only in their presentation format,) T3 /T4 which have had one dollar added to T1 and T2 (these distributions are exactly the same, they differ only in their presentation format,) and T5L, representing the zero skew and low stakes treatment. The column headings start with S1 for “Safe decisions number 1,” and R1 for “Risky decisions number 1,” and then S2 and R2, and so on.

As seen in the top panel of the HL design, the mean of the safe choice increases, but the mean of the risky choice increases more with each decision row. The variance follows a symmetric U-shaped pattern with the decision rows, first going up and then going down. The skew is held equal between S1 and R1, and it declines continuously across the decision rows. The middle panel replicates the top panel but with an increase in the mean by $1.

Examining the bottom panel displaying HL5 we have modified the prize distributions of S1 and R1 so that they both hold a skew of approximately zero. While fixing the skew to 0.00 for both the safe and the risky choices, we target the means and variances of S1 and R1, S2 and R2 and so on to be identical to the means and variances of the same decision options as in the HL+$1 T4 (graphical display) treatment. In various places the reader will find that we are only able to get approximately

close to our target mean, skew and variance due to the low number of tickets in each lottery and the difficulty of varying the variance but not the skew since they are positively correlated. Had we had more tickets we would have been able to be more precise. We do not consider these deviations from targets to be important, they vary randomly across decisions and are never substantial, except for the case of R9, where the variance is 1.4 times that of R9 in T4. However, this difference had no effect on subjects' choices of S9 versus R9 compared to T4 (or T2); the baseline graphics display. Zero subjects chose S9 and S10 in T2, T4 as well as T5L.

Moving on to the next page, the next Table "Appendix Table 2" displays two panels with the prize distributions for T6L, and T7L. In the top panel we have the treatment with medium skew for the risky choice (1.69). While fixing the skew of the risky choice to 1.69, we target the means and variances of S1 and R1, S2 and R2 and so on to be identical to the means of the same decision options as in the HL+$1 T3/T4 treatment. In various places the reader will find that we are only able to get approximately close to our target mean, skew and variance due to the low number of tickets in each lottery. For R1 we could not adjust up the variance enough of the risky choice and the skew in R1 and R2 (2.05 and 2.00) are also a bit different from the target skew of 1.69. We do not consider these deviations from our targets to be terribly important but the fact that R1 has about 40% lower variance than targeted and about 18% higher skew, may induce higher than expected skew loving answers for the moderate skew condition. R3 does not have such deviations from target and may serve as a useful comparison. We find that for R1, R2 and R3 in the zero skew we have [4, 10, 27] subject choices out of 124. For the moderate skew R1, R2 and R3 obtain [8, 20, 34] subject choices. Finally for maximum skew R1, R2 and R3 obtain [11, 18, 31] subject choices. It is not clear if the number of choices in medium skew for R1 and R2 represent significantly more than expected as choices for R3 also increase, while R3 does have the target skew and variance.

The second panel of "Appendix Table 2" displays the prize distributions for T7L with maximum skew for the risky choice (2.67). While fixing the skew of the risky choice to 2.67, we target the means and variance of S1 and R1, S2 and R2 and so on identical to the means of the same decision rows as in the T4 treatment. In various places the reader will find that we are only able to get approximately close to our target mean, skew and variance due to the low number of tickets in each lottery. However, there are only small and random deviations from the targets in this panel.

In the three panels of "Appendix Table 3" with the treatments T5H, T6H and T7H the mean has been increased 20 times. Accordingly, the variance increases 400 units. There are no additional deviations from our targets in these three panels as they simply reflect a 20X scaling from T5L, T6L and T7L. That means that as in T6L, for R1 we could not adjust up the variance enough of the risky choice and the skew in R1 and R2 (2.05 and 2.00) are also a bit different from the target skew of 1.69. This allows an opportunity to see whether the deviations from target produce over-subscription to R1 and R2. We find that for T5H, the number of subjects choosing R1, R2 and R3 are [2, 5, 10] out of 47, for T6H the choices are [4, 4, 9] and for T7H the choices are [5, 5, 11]. There is no great increase in both R1 and R2, as opposed to R3, in T6H. In fact, the number of choices of R2 goes down from 5 in T5H to 4 in T6H. We conclude that the potential effects on the experiment that the deviations from target variance and skew at R1 and R2 have are not important.

Supplementary Material - Experimental Design 5

Appendix Table 1

T1 - T2: HOLT AND LAURY LOTTERIES

	S1	R1	S2	R2	S3	R3	S4	R4	S5	R5	S6	R6	S7	R7	S8	R8	S9	R9	S10	R10
	160	10	160	10	160	10	160	10	160	10	160	10	160	10	160	10	160	10	200	385
	160	10	160	10	160	10	160	10	160	10	160	10	160	10	160	10	200	385	200	385
	160	10	160	10	160	10	160	10	160	10	160	10	160	10	200	385	200	385	200	385
	160	10	160	10	160	10	160	10	160	10	160	10	200	385	200	385	200	385	200	385
	160	10	160	10	160	10	160	10	160	10	200	385	200	385	200	385	200	385	200	385
	160	10	160	10	160	10	160	10	200	385	200	385	200	385	200	385	200	385	200	385
	160	10	160	10	160	10	200	385	200	385	200	385	200	385	200	385	200	385	200	385
	160	10	160	10	200	385	200	385	200	385	200	385	200	385	200	385	200	385	200	385
	160	10	200	385	200	385	200	385	200	385	200	385	200	385	200	385	200	385	200	385
	200	385	200	385	200	385	200	385	200	385	200	385	200	385	200	385	200	385	200	385
Mean	164	48	168	85	172	123	176	160	180	198	184	235	188	273	192	310	196	348	200	385
Variance	144	12656	256	22500	336	29531	384	33750	400	35156	384	33750	336	29531	256	22500	144	12656	0	0
Skewness	2,67	2,67	1,50	1,50	0,87	0,87	0,41	0,41	0,00	0,00	-0,41	-0,41	-0,87	-0,87	-1,50	-1,50	-2,67	-2,67	-	-

T3 - T4: HOLT AND LAURY LOTTERIES MODIFIED +100

	S1	R1	S2	R2	S3	R3	S4	R4	S5	R5	S6	R6	S7	R7	S8	R8	S9	R9	S10	R10
	260	110	260	110	260	110	260	110	260	110	260	110	260	110	260	110	260	110	300	485
	260	110	260	110	260	110	260	110	260	110	260	110	260	110	260	110	300	485	300	485
	260	110	260	110	260	110	260	110	260	110	260	110	260	110	300	485	300	485	300	485
	260	110	260	110	260	110	260	110	260	110	260	110	300	485	300	485	300	485	300	485
	260	110	260	110	260	110	260	110	260	110	300	485	300	485	300	485	300	485	300	485
	260	110	260	110	260	110	260	110	300	485	300	485	300	485	300	485	300	485	300	485
	260	110	260	110	260	110	300	485	300	485	300	485	300	485	300	485	300	485	300	485
	260	110	260	110	300	485	300	485	300	485	300	485	300	485	300	485	300	485	300	485
	260	110	300	485	300	485	300	485	300	485	300	485	300	485	300	485	300	485	300	485
	300	485	300	485	300	485	300	485	300	485	300	485	300	485	300	485	300	485	300	485
Mean	264	148	268	185	272	223	276	260	280	298	284	335	288	373	292	410	296	448	300	485
Variance	144	12656	256	22500	336	29531	384	33750	400	35156	384	33750	336	29531	256	22500	144	12656	0	0
Skewness	2,67	2,67	1,50	1,50	0,87	0,87	0,41	0,41	0,00	0,00	-0,41	-0,41	-0,87	-0,87	-1,50	-1,50	-2,67	-2,67	-	-

T5L: TREATMENT 5 (ZERO SKEW)) AND LOW STAKES (1x)

	S1	R1	S2	R2	S3	R3	S4	R4	S5	R5	S6	R6	S7	R7	S8	R8	S9	R9	S10	R10
	244	0	242	1	242	3	244	4	248	51	252	98	258	137	266	200	276	266	300	485
	249	9	249	10	250	18	252	40	256	68	260	115	266	163	273	230	281	283	300	485
	254	25	255	30	257	37	260	80	264	98	268	145	273	193	279	256	286	308	300	485
	259	55	262	60	265	73	268	110	272	148	276	185	281	243	286	285	291	374	300	485
	264	130	268	135	272	183	276	220	280	238	284	275	288	343	292	380	296	418	300	485
	264	190	268	200	272	263	276	300	280	358	284	395	288	403	292	440	296	478	300	485
	269	250	275	300	280	373	284	410	288	448	292	485	296	503	299	535	301	522	300	485
	274	263	281	360	287	409	292	440	296	498	300	525	303	553	305	564	306	588	300	485
	279	275	288	370	295	428	300	480	304	528	308	555	311	583	312	590	311	613	300	485
	284	285	294	385	302	443	308	516	312	545	316	572	318	609	318	620	316	630	300	485
Mean	264	148	268	185	272	223	276	260	280	298	284	335	288	373	292	410	296	448	300	485
Variance	150	12562	254	22493	338	29824	384	34087	384	36002	384	33354	338	29999	254	23348	150	17265	0	0
Skewness	0,00	-0,10	-0,01	0,11	-0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-0,01	0,00	-0,01	0,00	0,00	0,00	-	-

Supplementary Material - Experimental Design 6

Appendix Table 2

T6L: TREATMENT 6 (MODERATE SKEW)) AND LOW STAKES (1x)

	S1	R1	S2	R2	S3	R3	S4	R4	S5	R5	S6	R6	S7	R7	S8	R8	S9	R9	S10	R10
	244	100	242	100	242	107	244	137	248	171	252	211	258	257	266	309	276	372	300	401
	249	100	249	100	250	108	252	138	256	173	260	213	266	258	273	310	281	373	300	402
	254	100	255	101	257	111	260	141	264	176	268	216	273	261	279	313	286	375	300	404
	259	101	262	103	265	117	268	147	272	182	276	222	281	266	286	318	291	378	300	408
	264	103	268	106	272	127	276	158	280	193	284	233	288	277	292	327	296	385	300	416
	264	107	268	115	272	147	276	180	280	215	284	254	288	297	292	344	296	398	300	430
	269	118	275	136	280	185	284	221	288	257	292	295	296	335	299	378	301	423	300	458
	274	146	281	186	287	258	292	299	296	336	300	373	303	409	305	441	306	471	300	511
	279	214	288	307	295	398	300	448	304	489	308	523	311	549	312	564	311	563	300	612
	284	385	294	596	302	666	308	732	312	782	316	809	318	816	318	797	316	737	300	806
Mean	264	147	268	185	272	222	276	260	280	297	284	335	288	373	292	410	296	448	300	485
Variance	150	7425	254	22558	338	29499	384	33492	384	35187	384	33722	338	29563	254	22479	150	12600	0	15480
Skewness	0,00	2,05	-0,01	2,00	-0,01	1,69	0,00	1,69	0,00	1,69	0,00	1,69	-0,01	1,69	-0,01	1,69	0,00	1,69	-	1,69

T7L: TREATMENT 7 (MAXIMUM SKEW) AND LOW STAKES (1x)

	S1	R1	S2	R2	S3	R3	S4	R4	S5	R5	S6	R6	S7	R7	S8	R8	S9	R9	S10	R10
	244	110	242	135	242	165	244	199	248	235	252	274	258	315	266	360	276	410	300	444
	249	110	249	135	250	165	252	199	256	235	260	274	266	315	273	360	281	410	300	444
	254	110	255	135	257	165	260	199	264	235	268	274	273	315	279	360	286	410	300	444
	259	110	262	135	265	165	268	199	272	235	276	274	281	315	286	360	291	410	300	444
	264	110	268	135	272	165	276	199	280	235	284	274	288	315	292	360	296	410	300	444
	264	110	268	135	272	165	276	199	280	235	284	274	288	315	292	360	296	410	300	444
	269	110	275	135	280	165	284	199	288	235	292	274	296	315	299	360	301	410	300	444
	274	110	281	135	287	165	292	199	296	235	300	274	303	315	305	360	306	410	300	444
	279	110	288	135	295	165	300	199	304	235	308	274	311	315	312	360	311	410	300	444
	284	484	294	635	302	738	308	811	312	860	316	886	318	888	318	860	316	784	300	858
Mean	264	147	268	185	272	222	276	260	280	298	284	335	288	372	292	410	296	447	300	485
Variance	150	12589	254	22500	338	29550	384	33709	384	35156	384	33709	338	29550	254	22500	150	12589	0	15426
Skewness	0,00	2,67	-0,01	2,67	-0,01	2,67	0,00	2,67	0,00	2,67	0,00	2,67	-0,01	2,67	-0,01	2,67	0,00	2,67	-	2,67

Supplementary Material - Experimental Design 7

Appendix Table 3

T5H: TREATMENT 5 (ZERO SKEW)) AND HIGH STAKES (20x)

	S1	R1	S2	R2	S3	R3	S4	R4	S5	R5	S6	R6	S7	R7	S8	R8	S9	R9	S10	R10
	4880	0	4840	20	4840	60	4880	80	4960	1020	5040	1960	5160	2740	5320	4000	5520	5320	6000	9700
	4980	180	4980	200	5000	360	5040	800	5120	1360	5200	2300	5320	3260	5460	4600	5620	5660	6000	9700
	5080	500	5100	600	5140	740	5200	1600	5280	1960	5360	2900	5460	3860	5580	5120	5720	6160	6000	9700
	5180	1100	5240	1200	5300	1460	5360	2200	5440	2960	5520	3700	5620	4860	5720	5700	5820	7480	6000	9700
	5280	2600	5360	2700	5440	3660	5520	4400	5600	4760	5680	5500	5760	6860	5840	7600	5920	8360	6000	9700
	5280	3800	5360	4000	5440	5260	5520	6000	5600	7160	5680	7900	5760	8060	5840	8800	5920	9560	6000	9700
	5380	5000	5500	6000	5600	7460	5680	8200	5760	8960	5840	9700	5920	10060	5980	10700	6020	10440	6000	9700
	5480	5260	5620	7200	5740	8180	5840	8800	5920	9960	6000	10500	6060	11060	6100	11280	6120	11760	6000	9700
	5580	5500	5760	7400	5900	8560	6000	9600	6080	10560	6160	11100	6220	11660	6240	11800	6220	12260	6000	9700
	5680	5700	5880	7700	6040	8860	6160	10320	6240	10900	6320	11440	6360	12180	6360	12400	6320	12600	6000	9700
Mean	5280	2964	5364	3702	5444	4460	5520	5200	5600	5960	5680	6700	5764	7460	5844	8200	5920	8960	6000	9700
Variance	60000	5024704	101424	8997236	135024	11929680	153600	13634880	153600	14400720	153600	13341520	135024	11999680	101424	9339280	60000	6906000	0	0
Skewness	0,00	-0,10	-0,01	0,11	-0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-0,01	0,00	-0,01	0,00	0,00	0,00	-	-

T6H: TREATMENT 6 (MODERATE SKEW)) AND HIGH STAKES (20x)

	S1	R1	S2	R2	S3	R3	S4	R4	S5	R5	S6	R6	S7	R7	S8	R8	S9	R9	S10	R10
	4880	2000	4840	2000	4840	2140	4880	2740	4960	3420	5040	4220	5160	5140	5320	6180	5520	7440	6000	8020
	4980	2000	4980	2000	5000	2160	5040	2760	5120	3460	5200	4260	5320	5160	5460	6200	5620	7460	6000	8040
	5080	2000	5100	2020	5140	2220	5200	2820	5280	3520	5360	4320	5460	5220	5580	6260	5720	7500	6000	8080
	5180	2020	5240	2060	5300	2340	5360	2940	5440	3640	5520	4440	5620	5320	5720	6360	5820	7560	6000	8160
	5280	2060	5360	2120	5440	2540	5520	3160	5600	3860	5680	4660	5760	5540	5840	6540	5920	7700	6000	8320
	5280	2140	5360	2300	5440	2940	5520	3600	5600	4300	5680	5080	5760	5940	5840	6880	5920	7960	6000	8600
	5380	2360	5500	2720	5600	3700	5680	4420	5760	5140	5840	5900	5920	6700	5980	7560	6020	8460	6000	9160
	5480	2920	5620	3720	5740	5160	5840	5980	5920	6720	6000	7460	6060	8180	6100	8820	6120	9420	6000	10220
	5580	4280	5760	6140	5900	7960	6000	8960	6080	9780	6160	10460	6220	10980	6240	11280	6220	11260	6000	12240
	5680	7700	5880	11920	6040	13320	6160	14640	6240	15640	6320	16180	6360	16320	6360	15940	6320	14740	6000	16120
Mean	5280	2948	5364	3700	5444	4448	5520	5202	5600	5948	5680	6698	5764	7450	5844	8202	5920	8950	6000	9696
Variance	60000	2970096	101424	9023120	135024	11799696	153600	13396676	153600	14074656	153600	13488756	135024	11825140	101424	8991556	60000	5039860	0	6191824
Skewness	0,00	2,05	-0,01	2,00	-0,01	1,69	0,00	1,69	0,00	1,69	0,00	1,69	-0,01	1,69	-0,01	1,69	0,00	1,69	-	-

T7H: TREATMENT 7 (MAXIMUM SKEW) AND HIGH STAKES (20x)

	S1	R1	S2	R2	S3	R3	S4	R4	S5	R5	S6	R6	S7	R7	S8	R8	S9	R9	S10	R10
	4880	2200	4840	2700	4840	3300	4880	3980	4960	4700	5040	5480	5160	6300	5320	7200	5520	8200	6000	8880
	4980	2200	4980	2700	5000	3300	5040	3980	5120	4700	5200	5480	5320	6300	5460	7200	5620	8200	6000	8880
	5080	2200	5100	2700	5140	3300	5200	3980	5280	4700	5360	5480	5460	6300	5580	7200	5720	8200	6000	8880
	5180	2200	5240	2700	5300	3300	5360	3980	5440	4700	5520	5480	5620	6300	5720	7200	5820	8200	6000	8880
	5280	2200	5360	2700	5440	3300	5520	3980	5600	4700	5680	5480	5760	6300	5840	7200	5920	8200	6000	8880
	5280	2200	5360	2700	5440	3300	5520	3980	5600	4700	5680	5480	5760	6300	5840	7200	5920	8200	6000	8880
	5380	2200	5500	2700	5600	3300	5680	3980	5760	4700	5840	5480	5920	6300	5980	7200	6020	8200	6000	8880
	5480	2200	5620	2700	5740	3300	5840	3980	5920	4700	6000	5480	6060	6300	6100	7200	6120	8200	6000	8880
	5580	2200	5760	2700	5900	3300	6000	3980	6080	4700	6160	5480	6220	6300	6240	7200	6220	8200	6000	8880
	5680	9680	5880	12700	6040	14760	6160	16220	6240	17200	6320	17720	6360	17760	6360	17200	6320	15680	6000	17160
Mean	5280	2948	5364	3700	5444	4446	5520	5204	5600	5950	5680	6704	5764	7446	5844	8200	5920	8948	6000	9708
Variance	60000	5035536	101424	9000000	135024	11819844	153600	13483584	153600	14062500	153600	13483584	135024	11819844	101424	9000000	60000	5035536	0	6170256
Skewness	0,00	2,67	-0,01	2,67	-0,01	2,67	0,00	2,67	0,00	2,67	0,00	2,67	-0,01	2,67	-0,01	2,67	0,00	2,67	-	-

Screen Images from the Computer Program Used to Run the Experiments

The following pages contain screen images from the computer program used to run the experiments. It does not follow the exact sequence of any treatment sequence as we wanted to show the main differences in instructions between different treatment sequences.

The first screen describes the introductory page. All see this. The subject must click on accept to undertake the experiment. All did.

The second screen contains initial instructions. This page varies depending on subject. The version presented is especially designed for T1 and T3, the initial tabular display treatment. If the subjects started with T2 or T4 they were instructed similarly, but with a graphical version instead.

The third page contains a knowledge test, which the subject must pass to undertake the experiment. All see this. Eventually all passed.

Next follows the screen for T1, identical in presentation to HL.

The next is the screen introducing T5-T7, the graphical display treatment which follows if the subject first took T1 or T3. This screen is not presented if the subject immediately started with T5 as it would be redundant with the general graphical display instructions.

The next sequence of screens contains what are called “Lottery1”, “Lottery2”, etc., up to “Lottery10”. In this set of screen shots we capture the 10 decisions for T5L. (The screens were identical, except for the differences in prize distributions, for T5L, T6L, T7L, T5H, T6H and T7H.) There is one choice per computer page. After making a choice between Lottery A or Lottery B the subject must click on the “next” button to move to the next choice. The subject may click on the back button to change their prior decision. However, prior to starting T5L the subjects are instructed that they will get to a review section where all their choices are presented and where they can make changes to their final choices. This is the next screen. It presents all 10 choices in one page. The subject has to scroll down the page to see all. All the 20 buttons can be clicked to change any decision. Once they click on “next” they cannot go back and change their decisions.

The next sequence of screens contains “Lottery1”, “Lottery2”, etc., up to “Lottery10” for T7L. (We skipped presenting T6L.) A review screen then appears.

Finally the subject has made all his/her decisions. This particular subject went through the sequence T1, T5L, T6L, and T7L.

The subject then arrives at the page where we draw the prize from his/her choices. First, there is a 1 in 4 chance of drawing the price from each of T1, T5L, T6L, and T7L. The subject clicks on the green “Roll Dice” button to determine which treatment the prize is drawn. As shown in the second screen, problem set 2 (T5L) was randomly chosen. The subject then clicks on the blue “Roll Dice” button to determine which Lottery (out of 10) the prize is drawn. As shown in the second screen, Lottery 10 was randomly chosen. The subject then clicks on the red “Roll Dice” button to determine which prize to draw from that Lottery (out of 10 prizes). As shown in the second screen, prize 2 (300 cents) was randomly chosen. Any one of these three buttons can only be clicked once and in the exact sequence green, blue, red.

The next page contains the background characteristics survey, which is voluntary.

The next page contains a summary of earnings; in this case $5 participation + $3 lottery earnings.

The next page tells the subject they are done, and to take their assignment sheet to the experimenter to get paid.

Gambling on Lotteries

This study is being conducted by Prof Thomas Astebro of the Rotman School of Management, University of Toronto,and Prof. Scott Jeffrey of the Management Sciences Department, University of Waterloo, with student assistance given by Gordon Adomdza. The study examines individuals' preferences for gambling on lotteries.

If you agree to participate in this study, you will be asked to complete a series of questions on the computer. You will be given the opportunity to gamble on various lotteries. The gambles will not cost you anything. You will also be asked general background questions like "what's your major in school?" You will be paid according to your choices and as a function of chance. You can win as little as $0 and as much as $8.6 on some lotteries. We expect to pay about $3.5 to the average participant. You will also be paid $5 for your participation no matter what your earnings are.

Participation in this study is voluntary, and will take between 30 minutes to one hour. You may decline to answer any questions that you do not wish to answer and you can withdraw your participation at any time. All information you provide is considered strictly confidential. You will not be identified individually in any way in this research. Data collected during this study will be retained for 10 years on a server in the Management Sciences department *and then erased*. Only researchers associated with this project will have access. There are no known or anticipated risks from participating in this study.

By pressing the accept button, you consent to participate in this study. Otherwise click on the reject button to end participation.

REJECT ACCEPT

LOTTERY CHOICES

Read these instructions carefully as your understanding of them will affect your ability to earn money.

After you have read these instructions we will test your knowledge of the instructions. You need to pass this knowledge test in order to participate in the experiment and earn money.

The problems are not designed to test you. What we want to know is what choices you would make in them. The only right answer is what you really would choose. That is why the problems give you the chance of winning real money.

Below these instructions there is a decision sheet showing ten decisions. Each decision is a paired choice between "Option A" and "Option B." You will make ten choices by clicking on radio buttons, but only one of them will be used in the end to determine your earnings.

Before you start making your ten choices, please let me explain how these choices will affect your earnings.

We will use the equivalent of a ten-sided die to select one of the ten decisions that you have made to determine your payoff. This will be illustrated by your 10 different decisions being highlighted one at a time. After a random amount of time, the computer will stop at one of the decisions. That will be the decision that will be used to determine your payoff.

We will then use the computer to determine the payoff for the particular decision selected, again using the equivalent of a ten-sided die. The payoff depends on the amounts possible to win and the probability of winning, which varies with each decision.

So, even though you will make ten decisions, only one of these will end up affecting your earnings, but you will not know in advance which decision will be used. Obviously, each decision has an equal chance of being used in the end.

Now, please look at Decision 1 at the top. Option A pays 200 cents if the throw of the ten sided die is 1, and it pays 160 cents if the throw is 2-10.

Option B yields 385 cents if the throw of the die is 1, and it pays 10 cents if the throw is 2-10. The other Decisions are similar, except that as you move down the table, the chances of higher payoff for each option increase. In fact, for Decision 10 in the bottom row, the die will not be needed since each option pays the highest payoff for sure, so your choice is between 200 cents or 385 cents.

There will be a total of four problem sets, each composed of ten decisions. In each problem set the options and payoffs will be different. In the end we will only use one of the four problem sets to determine your earnings. The choice of which problem set to use to determine earnings will be random; each problem set has the same probability of being chosen.

	Option A			Option B
1.	1/10 of 200 cents or 9/10 of 160 cents		1.	1/10 of 385 cents or 9/10 of 10 cents
2.	2/10 of 200 cents or 8/10 of 160 cents		2.	2/10 of 385 cents or 8/10 of 10 cents
3.	3/10 of 200 cents or 7/10 of 160 cents		3.	3/10 of 385 cents or 7/10 of 10 cents
4.	4/10 of 200 cents or 6/10 of 160 cents		4.	4/10 of 385 cents or 6/10 of 10 cents
5.	5/10 of 200 cents or 5/10 of 160 cents		5.	5/10 of 385 cents or 5/10 of 10 cents
6.	6/10 of 200 cents or 4/10 of 160 cents		6.	6/10 of 385 cents or 4/10 of 10 cents
7.	7/10 of 200 cents or 3/10 of 160 cents		7.	7/10 of 385 cents or 3/10 of 10 cents
8.	8/10 of 200 cents or 2/10 of 160 cents		8.	8/10 of 385 cents or 2/10 of 10 cents
9.	9/10 of 200 cents or 1/10 of 160 cents		9.	9/10 of 385 cents or 1/10 of 10 cents
10.	10/10 of 200 cents or 0/10 of 160 cents		10.	10/10 of 385 cents or 0/10 of 10 cents

To summarize, in each problem set, you will make ten choices: for each choice you will have to decide between Option A and Option B. You may choose Option A for some decisions and Option B for other decisions, and you may change your decisions and make them in any order. When you are finished with making all ten choices the computer will move on to the next problem set. This will be repeated four times.

At the end the computer will randomly select one of the four problem sets to determine your earnings. From that problem set the computer will randomly select which of the ten decisions will be used to determine your earnings. The computer will then randomly choose one prize from that lottery and that prize will be your actual earnings. You will be paid all earnings in cash when finished.

We will test your understanding of these instructions after you have clicked on "next".

Next

KNOWLEDGE TEST

Please check the box which applies.

1. What is the maximum amount of earnings you can make on Option A presented in the previous page?

- ○ 400 cents
- ○ 400 dollars
- ○ 200 cents
- ○ 160 dollars
- ○ 385 cents

---

2. What is the chance that you will earn 160 cents if the first die landed on decision 1 and you had chosen Option A?

- ○ 9/10
- ○ 1/10
- ○ 9/20
- ○ 2/10
- ○ 4/20

---

3. How many choices will you make for this problem set?

- ○ Two
- ○ Ten
- ○ Twenty
- ○ Forty
- ○ Sixty

Next

INSTRUCTIONS

Please select your ten choices.

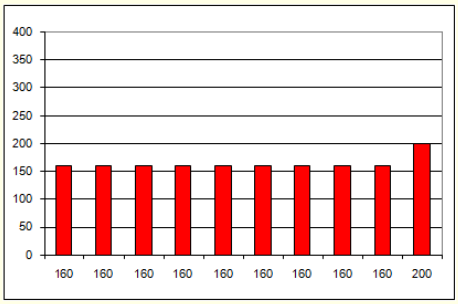
	Option A			Option B	
1.	1/10 of 200 cents or 9/10 of 160 cents	○	1.	1/10 of 385 cents or 9/10 of 10 cents	○
2.	2/10 of 200 cents or 8/10 of 160 cents	○	2.	2/10 of 385 cents or 8/10 of 10 cents	○
3.	3/10 of 200 cents or 7/10 of 160 cents	○	3.	3/10 of 385 cents or 7/10 of 10 cents	○
4.	4/10 of 200 cents or 6/10 of 160 cents	○	4.	4/10 of 385 cents or 6/10 of 10 cents	○
5.	5/10 of 200 cents or 5/10 of 160 cents	○	5.	5/10 of 385 cents or 5/10 of 10 cents	○
6.	6/10 of 200 cents or 4/10 of 160 cents	○	6.	6/10 of 385 cents or 4/10 of 10 cents	○
7.	7/10 of 200 cents or 3/10 of 160 cents	○	7.	7/10 of 385 cents or 3/10 of 10 cents	○
8.	8/10 of 200 cents or 2/10 of 160 cents	○	8.	8/10 of 385 cents or 2/10 of 10 cents	○
9.	9/10 of 200 cents or 1/10 of 160 cents	○	9.	9/10 of 385 cents or 1/10 of 10 cents	○
10.	10/10 of 200 cents or 0/10 of 160 cents	○	10.	10/10 of 385 cents or 0/10 of 10 cents	○

Next

INSTRUCTIONS

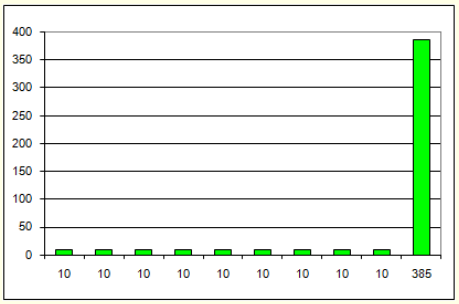
Now, instead of a table, your computer will show two graphs per screen, one red and one green. Two example graphs are presented below so that you understand the following description. Each graph contains one lottery and your task is to choose which one of the two lotteries to play. Each lottery has 10 prizes, each with a 1/10 chance of winning. The horizontal axis shows the ten different prizes and the height of the bar represents the amount won for each prize. The exact prize amounts are given below each bar. In the example below, in the red lottery there are 9 out of 10 chances of winning 160 cents. There is also a 1/10 chance of winning 200 cents. For the green lottery the chance of winning 10 cents is 9/10 and there is a 1/10 chance of winning 385 cents.

Example - Lottery A



RED ○

Example - Lottery B



GREEN ○

For each screen page you need to make a decision which one of the two lotteries you prefer to gamble on, either the red or the green. You will mark your choice below the two graphs by clicking with the mouse. You will then move on to the next page, and make another choice between two new lotteries. For this problem set you will make ten choices. Once you have finished making all ten choices there will be a review section, where all your choices are presented. You can review your choices and make changes to your final choices.

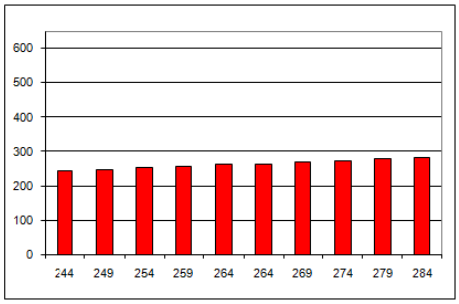
Once you have completed your choices you will move on to the next problem set. Earnings will be determined at the end of the fourth problem set.

Next

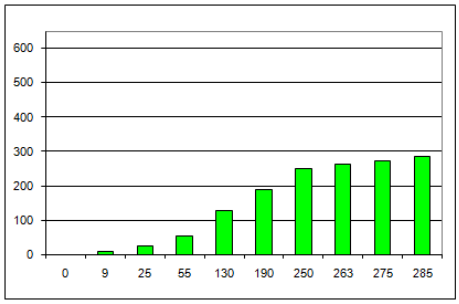
LOTTERY 1

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #1



RED ○



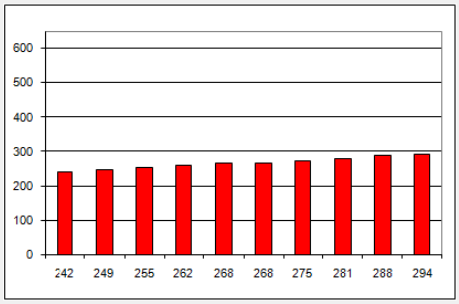
GREEN ○

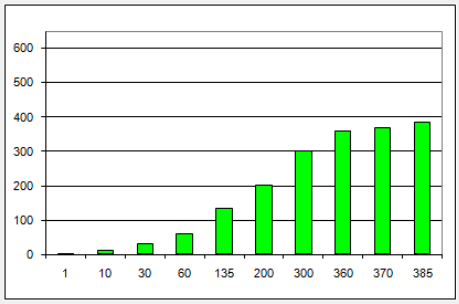
Next

LOTTERY 2

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #2





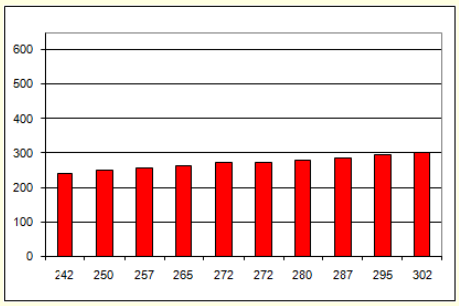
RED ○ GREEN ○

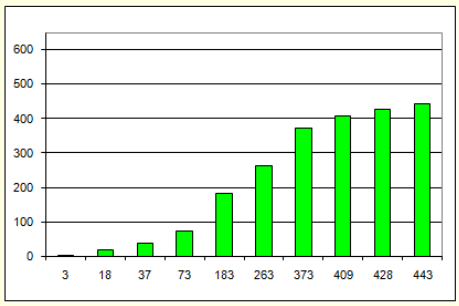
Next

LOTTERY 3

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #3





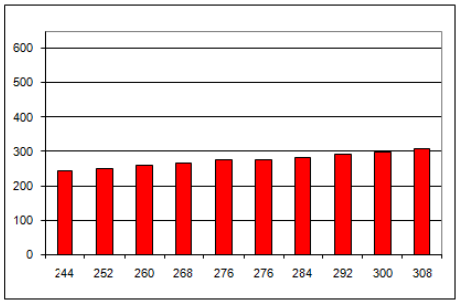
RED ○ GREEN ○

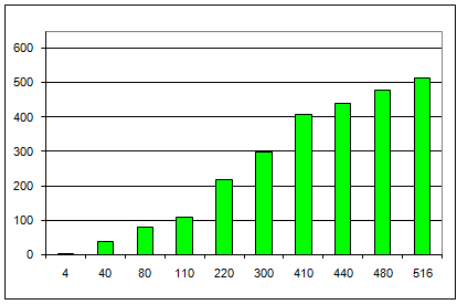
Next

LOTTERY 4

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #4





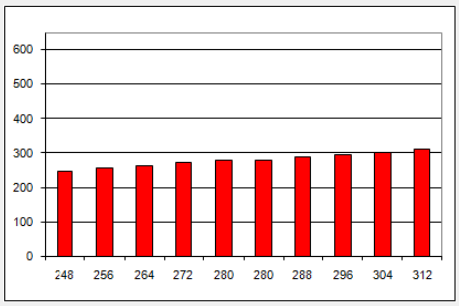
RED ○ GREEN ○

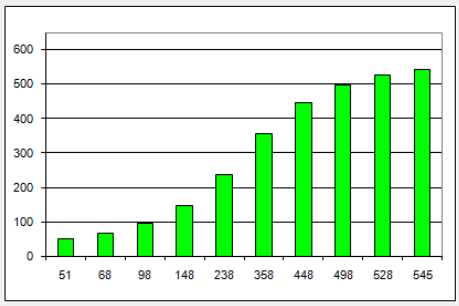
Next

LOTTERY 5

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #5





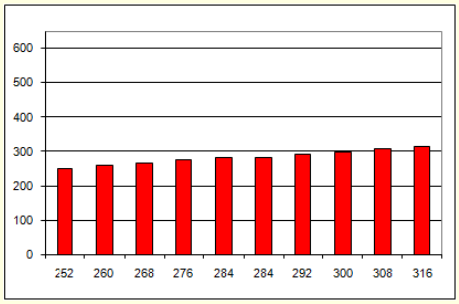
RED ○ GREEN ○

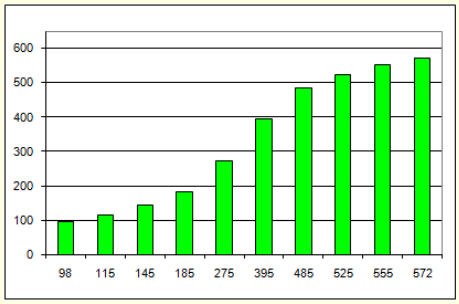
Next

LOTTERY 6

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #6





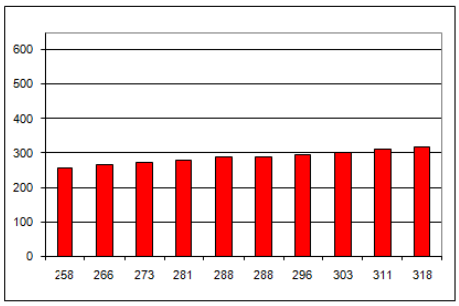
RED ○ GREEN ○

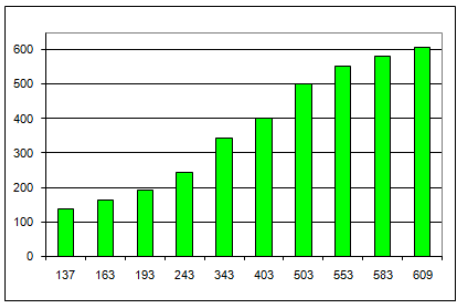
Next

LOTTERY 7

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #7





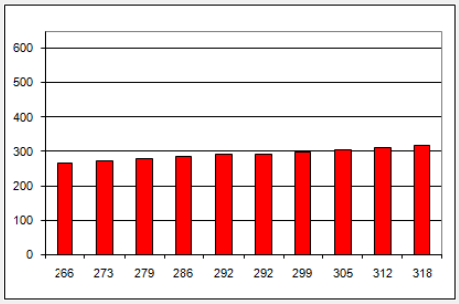
RED ○ GREEN ○

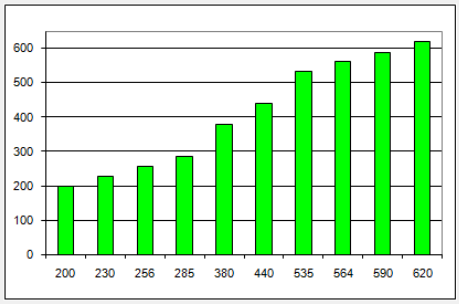
Next

LOTTERY 8

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #8





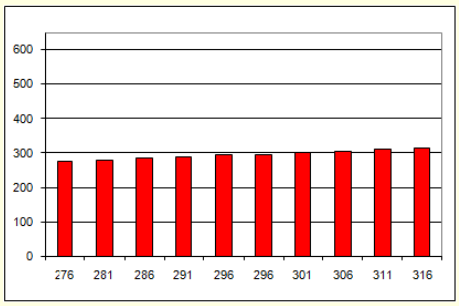
RED ○ GREEN ○

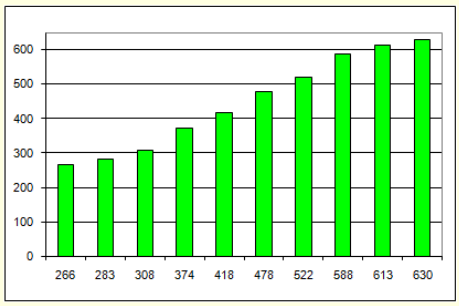
Next

LOTTERY 9

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #9





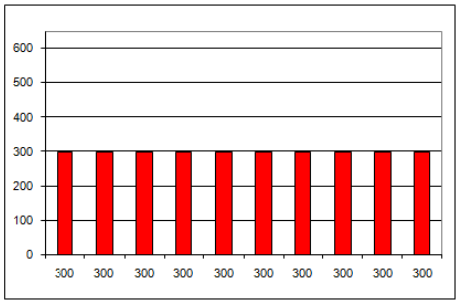
RED ○ GREEN ○

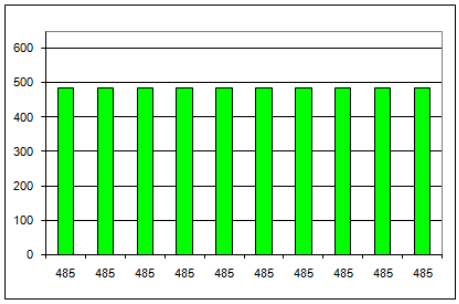
Next

LOTTERY 10

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #10





RED ○ GREEN ○

Next


LOTTERY REVIEW SESSION
Please review your choices and make any changes necessary.
Lottery #1
RED
GREEN
Lottery #2
RED
GREEN
Lottery #3
RED
GREEN
Lottery #4
RED
GREEN
Lottery #5
RED
GREEN
Lottery #6
RED
GREEN
Lottery #7
RED
GREEN
Lottery #8
RED
GREEN
Lottery #9
RED
GREEN
Lottery #10
RED
GREEN
Next

INSTRUCTIONS

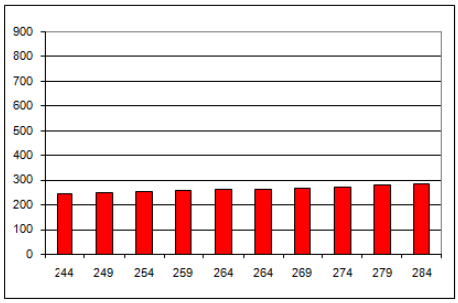
As before, your computer will show two graphs per screen, one red and one green. Each lottery has 10 prizes, each with a 1/10 chance of winning. Mark your choice below the two graphs by clicking with the mouse. You will make ten choices. There will be a review section. Once you have completed your choices you will move on to the next problem set. Earnings will be determined at the end of the fourth problem set.

Next

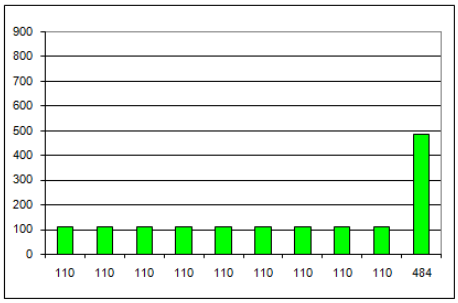
LOTTERY 1

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #1



RED ○



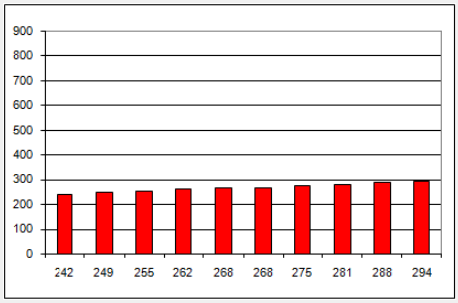
GREEN ○

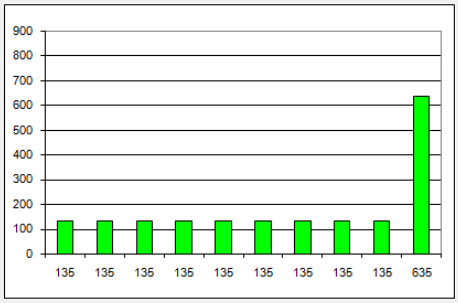
Next

LOTTERY 2

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #2





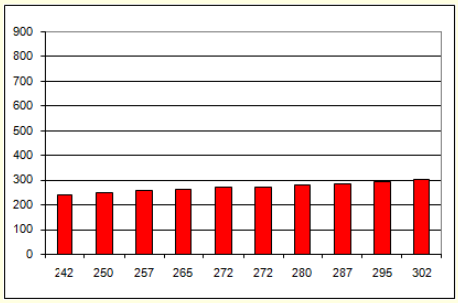
RED ○ GREEN ○

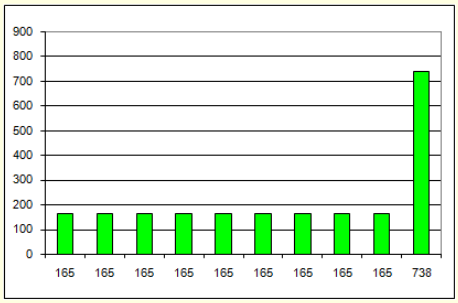
Next

LOTTERY 3

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #3





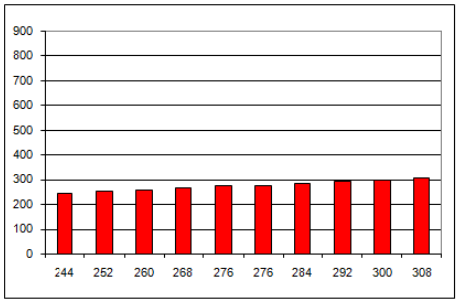
RED ○ GREEN ○

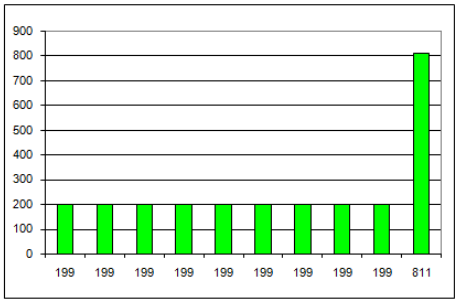
Next

LOTTERY 4

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #4





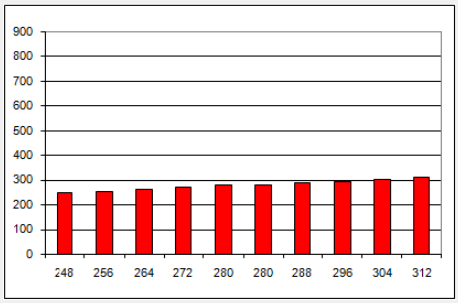
RED ○ GREEN ○

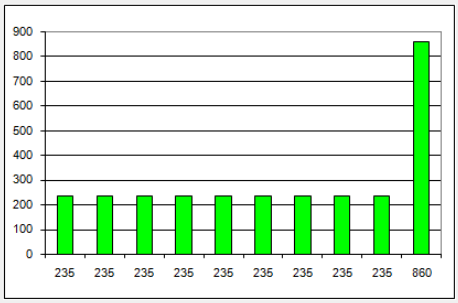
Next

LOTTERY 5

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #5





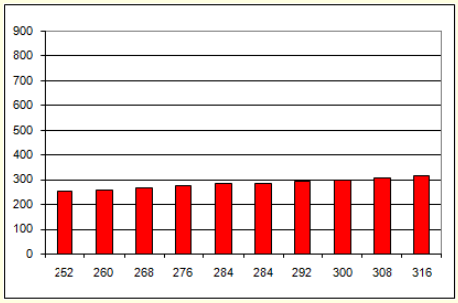
RED ○ GREEN ○

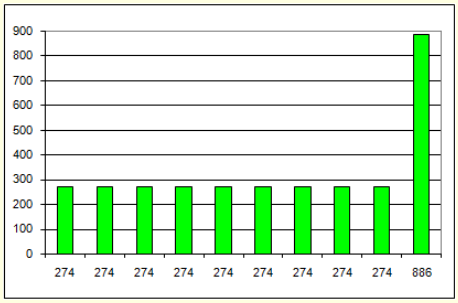
Next

LOTTERY 6

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #6





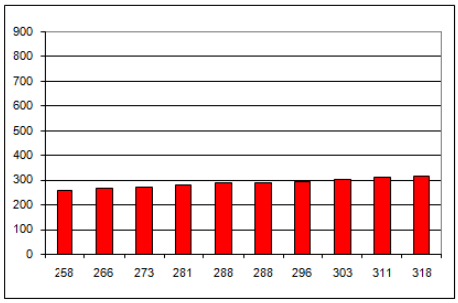
RED ○ GREEN ○

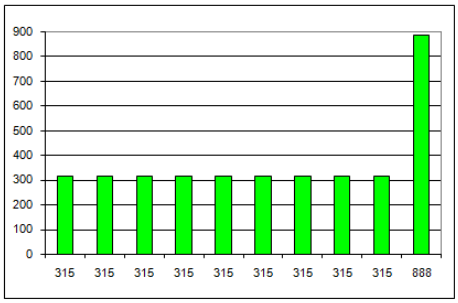
Next

LOTTERY 7

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #7





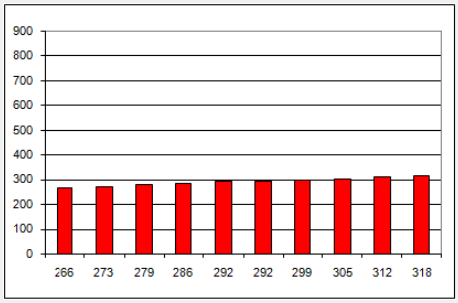
RED ○ GREEN ○

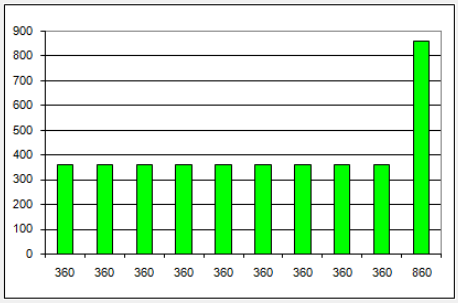
Next

LOTTERY 8

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #8





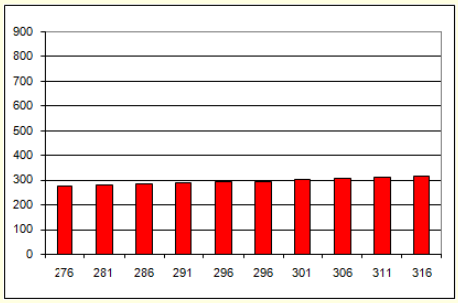
RED ○ GREEN ○

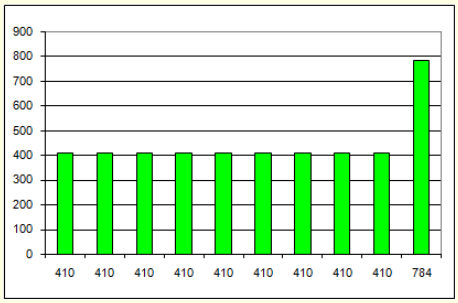
Next

LOTTERY 9

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #9





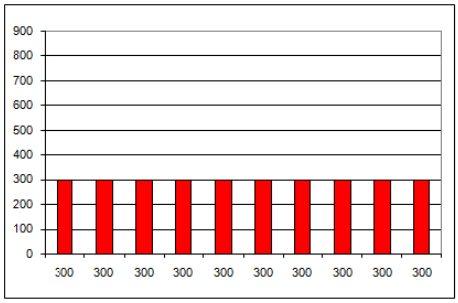
RED ○ GREEN ○

Next

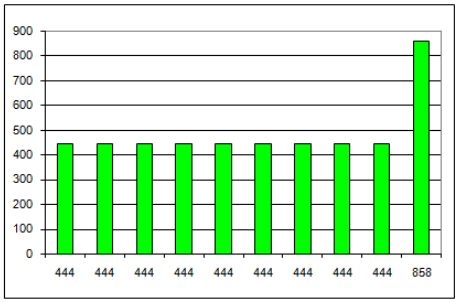
LOTTERY 10

Please mark your choice below the two graphs by clicking with the mouse.

Lottery #10



RED ○



GREEN ○

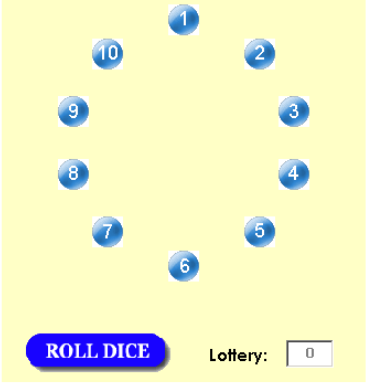
Next


LOTTERY REVIEW SESSION
Please review your choices and make any changes necessary.
Lottery #1
RED
GREEN
Lottery #2
RED
GREEN
Lottery #3
RED
GREEN
Lottery #4
RED
GREEN
Lottery #5
RED
GREEN
Lottery #6
RED
GREEN
Lottery #7
RED
GREEN
Lottery #8
RED
GREEN
Lottery #9
RED
GREEN
Lottery #10
RED
GREEN
Next

DETERMINING EARNINGS

Please click the green "Roll Dice" button to pick a problem set, the blue "Roll Dice" button to pick a lottery, and the red "Roll Dice" button to determine earnings.

Problem Set 1 | Problem Set 2 | Problem Set 3 | Problem Set 4 | ROLL DICE | Problem Set: 0



ROLL DICE Lottery: 0

ROLL DICE Earnings: 0

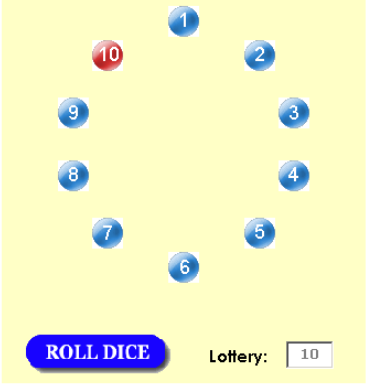
Please be patient while the dice are being rolled by the computer. This may take up to 20 seconds for each die.

Next

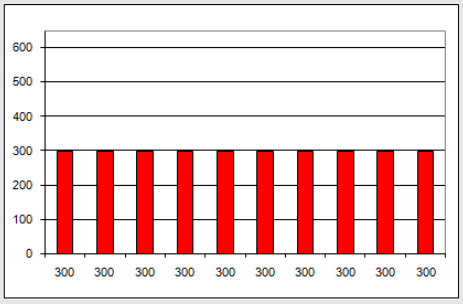
DETERMINING EARNINGS

Please click the green "Roll Dice" button to pick a problem set, the blue "Roll Dice" button to pick a lottery, and the red "Roll Dice" button to determine earnings.

Problem Set 1 | Problem Set 2 | Problem Set 3 | Problem Set 4 | ROLL DICE | Problem Set: 2



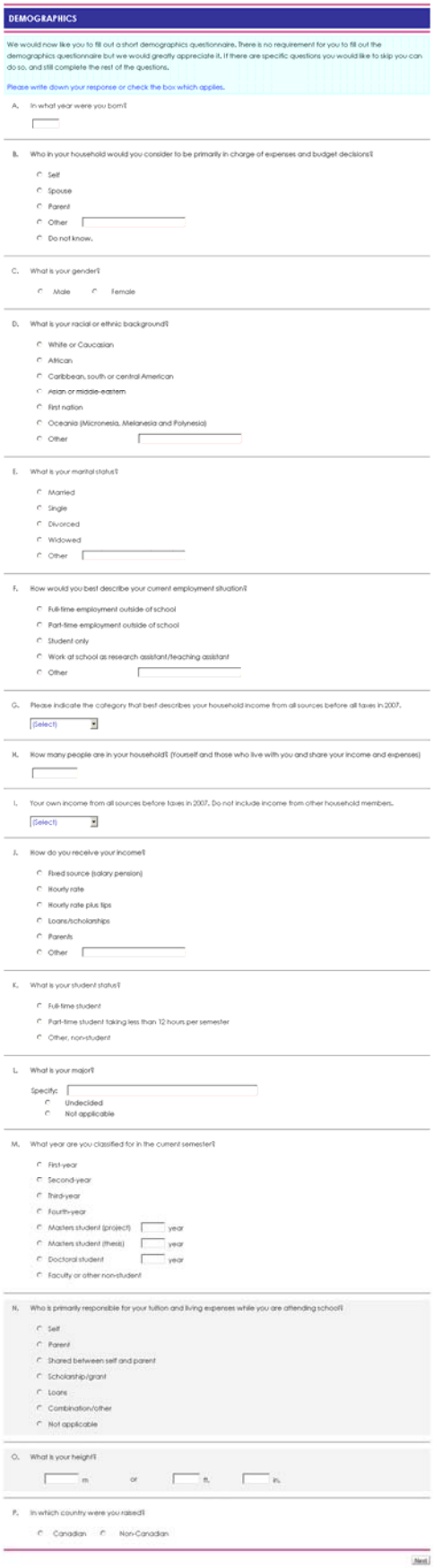
ROLL DICE Lottery: 10



ROLL DICE Earnings: 300

Please be patient while the dice are being rolled by the computer. This may take up to 20 seconds for each die.

Next



DEMOGRAPHICS

We would now like you to fill out a short demographics questionnaire. There is no requirement for you to fill out the demographics questionnaire but we would greatly appreciate it. If there are specific questions you would like to skip you can do so, and still complete the rest of the questions.

Please write down your response or check the box which applies.

A. In what year were you born?

B. Who in your household would you consider to be primarily in charge of expenses and budget decisions?
- Self
- Spouse
- Parent
- Other
- Do not know.

C. What is your gender?
- Male
- Female

D. What is your racial or ethnic background?
- White or Caucasian
- African
- Caribbean, south or central American
- Asian or middle-eastern
- First nation
- Oceania (Micronesia, Melanesia and Polynesia)
- Other

E. What is your marital status?
- Married
- Single
- Divorced
- Widowed
- Other

F. How would you best describe your current employment situation?
- Full-time employment outside of school
- Part-time employment outside of school
- Student only
- Work at school as research assistant/teaching assistant
- Other

G. Please indicate the category that best describes your household income from all sources before all taxes in 2007.
(Select)

H. How many people are in your household? (Yourself and those who live with you and share your income and expenses)

I. Your own income from all sources before taxes in 2007. Do not include income from other household members.
(Select)

J. How do you receive your income?
- Fixed source (salary pension)
- Hourly rate
- Hourly rate plus tips
- Loans/scholarships
- Parents
- Other

K. What is your student status?
- Full-time student
- Part-time student taking less than 12 hours per semester
- Other, non-student

L. What is your major?
Specify:
- Undecided
- Not applicable

M. What year are you classified for in the current semester?
- First-year
- Second-year
- Third-year
- Fourth-year
- Masters student (project) year
- Masters student (thesis) year
- Doctoral student year
- Faculty or other non-student

N. Who is primarily responsible for your tuition and living expenses while you are attending school?
- Self
- Parent
- Shared between self and parent
- Scholarship/grant
- Loans
- Combination/other
- Not applicable

O. What is your height?
m or ft. in.

P. In which country were you raised?
- Canadian
- Non-Canadian

Next

Summary of Earnings

You have now completed the study. Your total earnings are provided below (in cents). Please take your assignment sheet and write down your total earnings. You are done.

Your total earnings is $ 8.00 (800 cents).

= Participation Fee ($ 5.00) + Earnings from Gambling on Lottery ($ 3.00)

Next

Gambling on Lotteries

You have completed the experiment.
Please take your assignment sheet to the administrator to get paid. Thank you very much.

SURVEY END