Online Appendix:

Revealing Choice Bracketing

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Appendix B. Supplementary Data Visualizations

Risk and Social Experiments. First, we plot histograms of allocations in each part in Risk and Social Experiments (Figures 2 and 3). Notice that while the two experiments have a similar number of subjects (99 and 102 respectively), the y-axis scale differs across the two histograms. This reflects greater variation in behavior in the Risk than in the Social Experiment in D2 and D4. In both experiments, the vast majority of subjects make an equal allocation between assets/persons A and B, consistent with strict symmetric preferences. In Risk, 69 subjects make equal allocations in D4 (79 are within one token of doing so) while in Social the corresponding number is 90 subjects (97 within one token). While some variation in behavior is the norm in experiments, prior normative, behavioral, and experimental work on risk preferences generally suggests that risk aversion over 50-50 lotteries is not just strongly modal but a nearly universal. This illustrates the value of including D2, D4, and D5 in our Risk Experiment to enable us to apply WARP-style tests which do not require assumptions about preferences.

FIGURE 2. Allocations in Risk by part

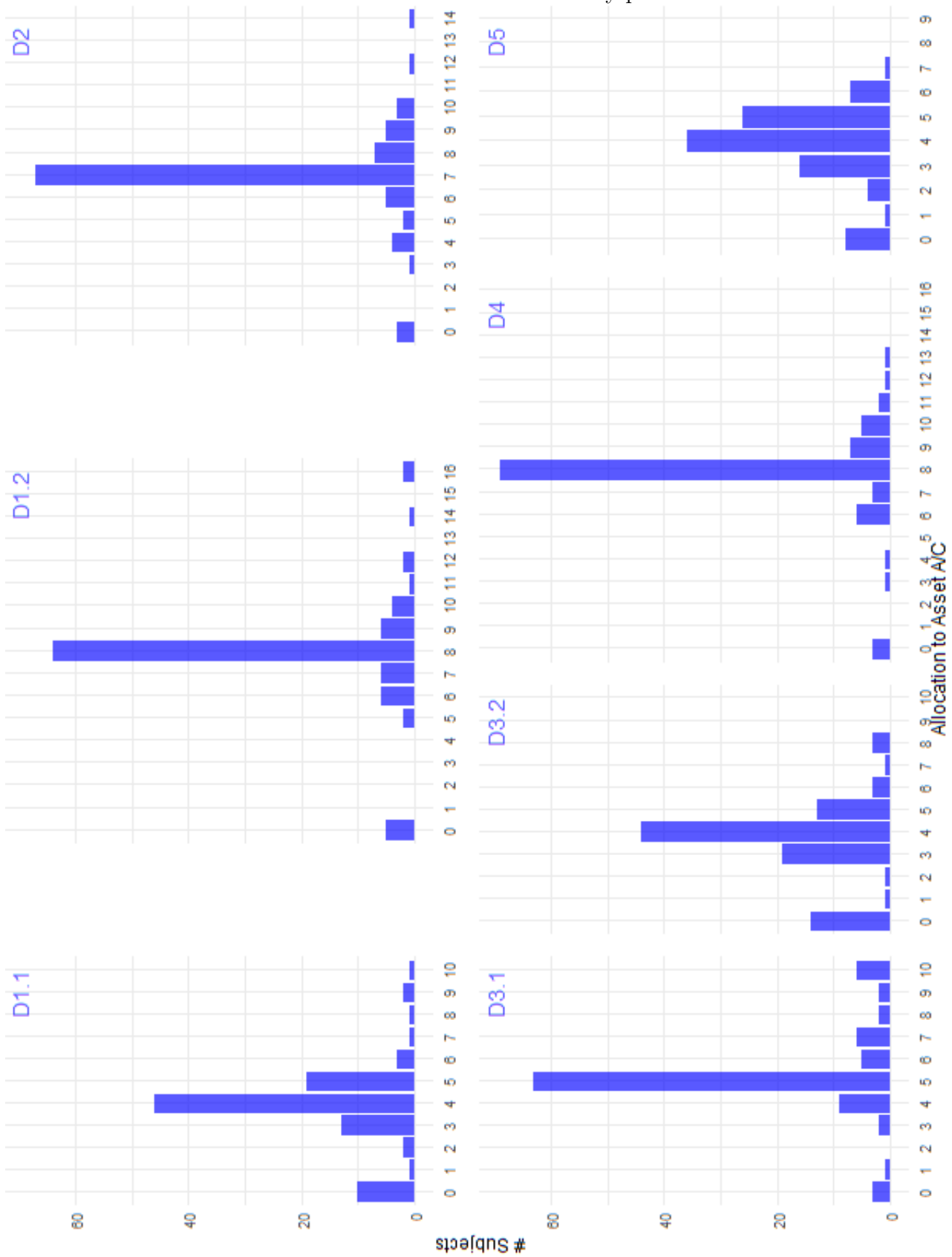


FIGURE 3. Allocations in Social by part

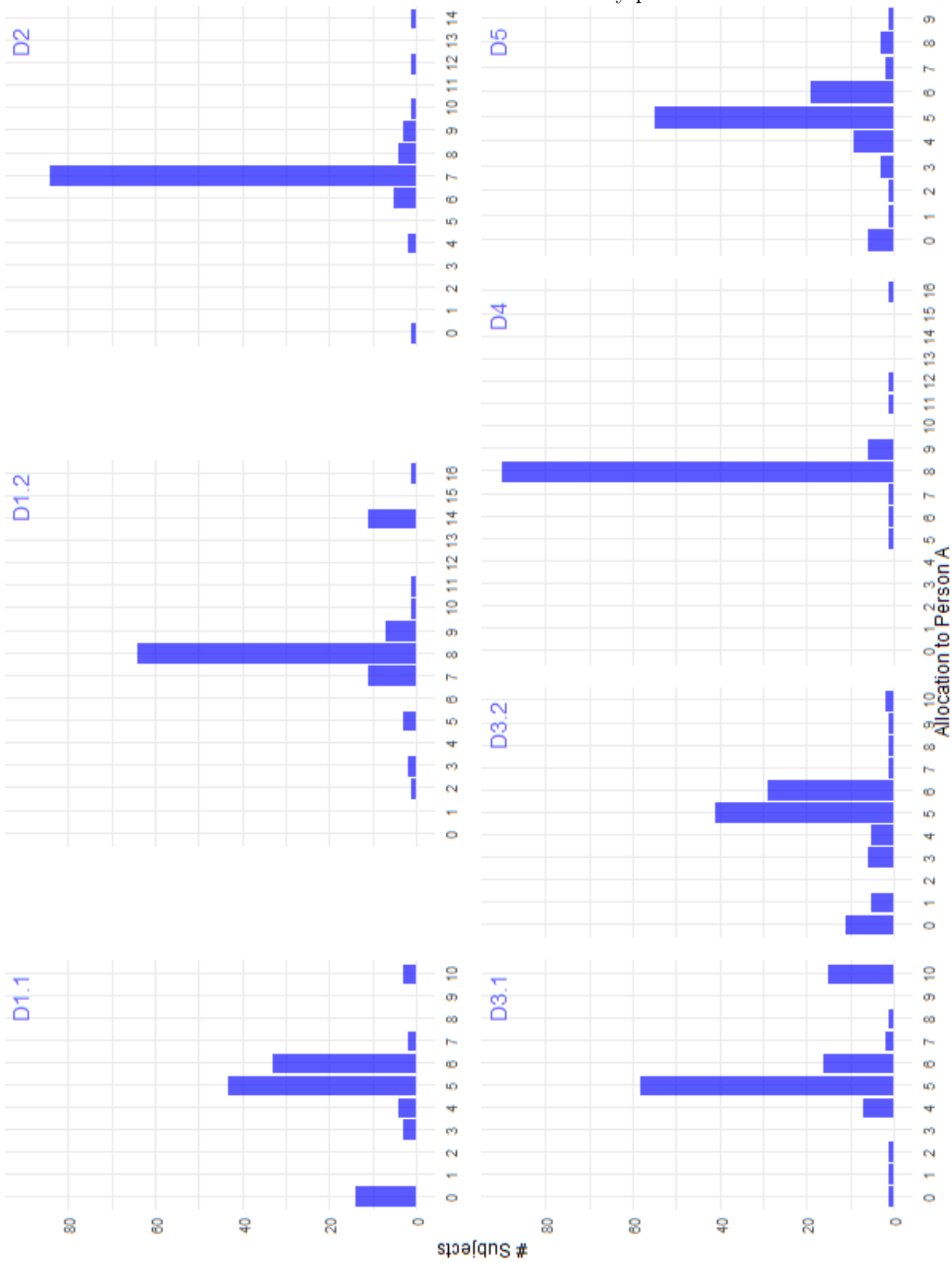


Figure 4 plots the aggregate (i.e. decision-level) allocations to die rolls 1-3/4-6 (Risk) and Person A/B (Social) in Decision 1 (shown in red) and in Decision 2 (shown in blue); the size of each circle is proportional to the number of subjects making an allocation. Our BB-WARP is based on a comparison of these allocations for each individual. While the blue dots (D2) lie on a line with slope -1 extending from (0, 28) to (28,0), almost all of the mass in red (D1) lies below that line – indicating subjects who made D1 choices that resulted in a dominated overall bundle. Since it is impossible in Decision 1 to obtain an aggregate bundle that allocates strictly more than \$16 to die roll 1-3/Person A, the very small number of subjects (10 in Risk, 6 in Social) who make such an allocation in Decision 2 automatically pass BB-WARP.

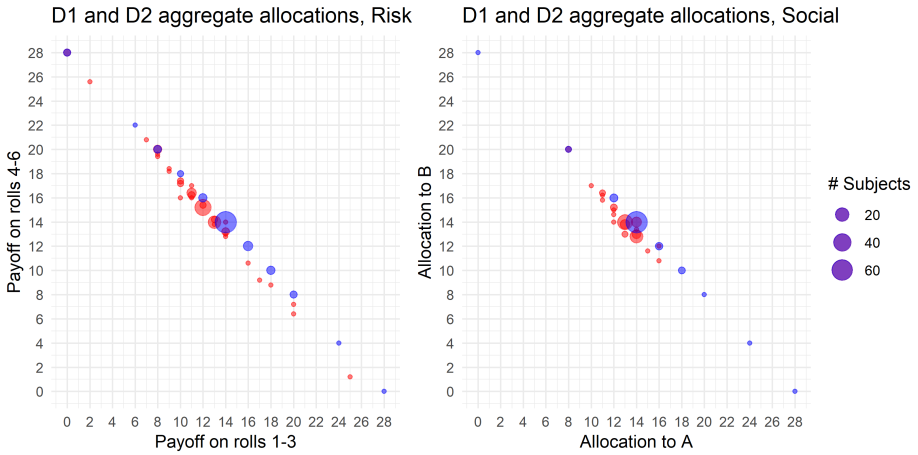


FIGURE 4. Aggregate allocations in D1 (red) and D2 (blue)

Figure 5 plots the individual-level allocations to Asset A/C in D1.1, D3.2, and D1.2 against their allocation in D5, D5, and D4 respectively. NB-WARP tests that the person makes the same allocation in each pair of parts, and is satisfied by all dots on line through (0,0) with a slope of 1.

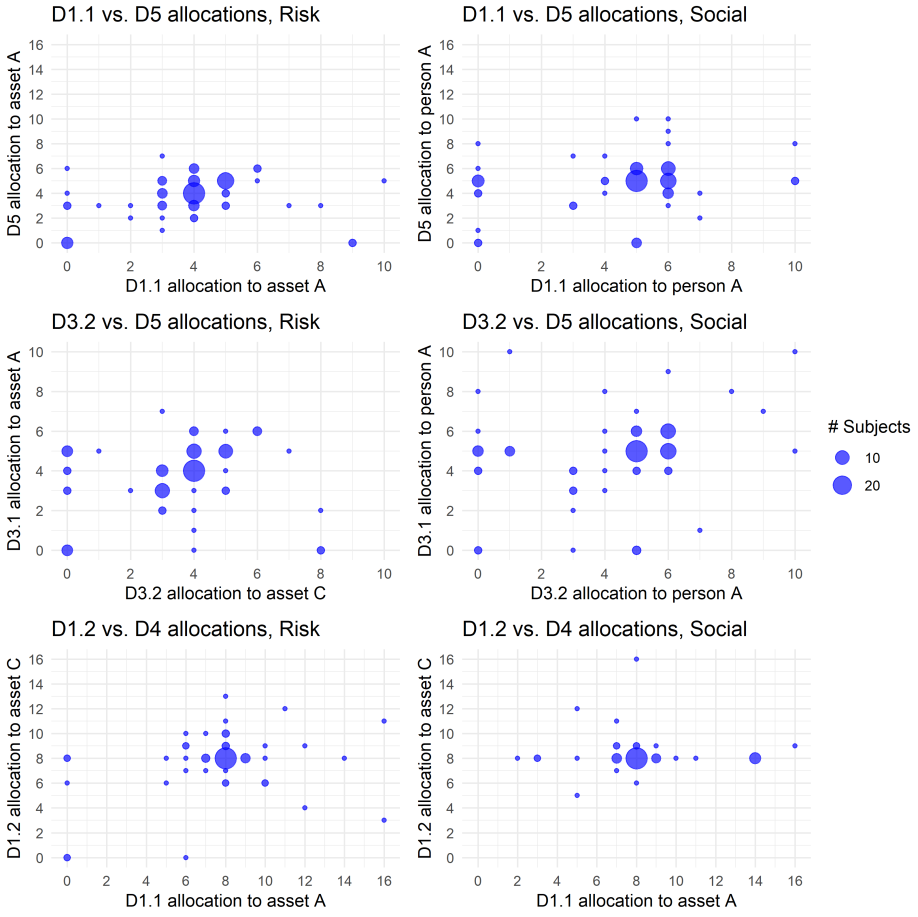
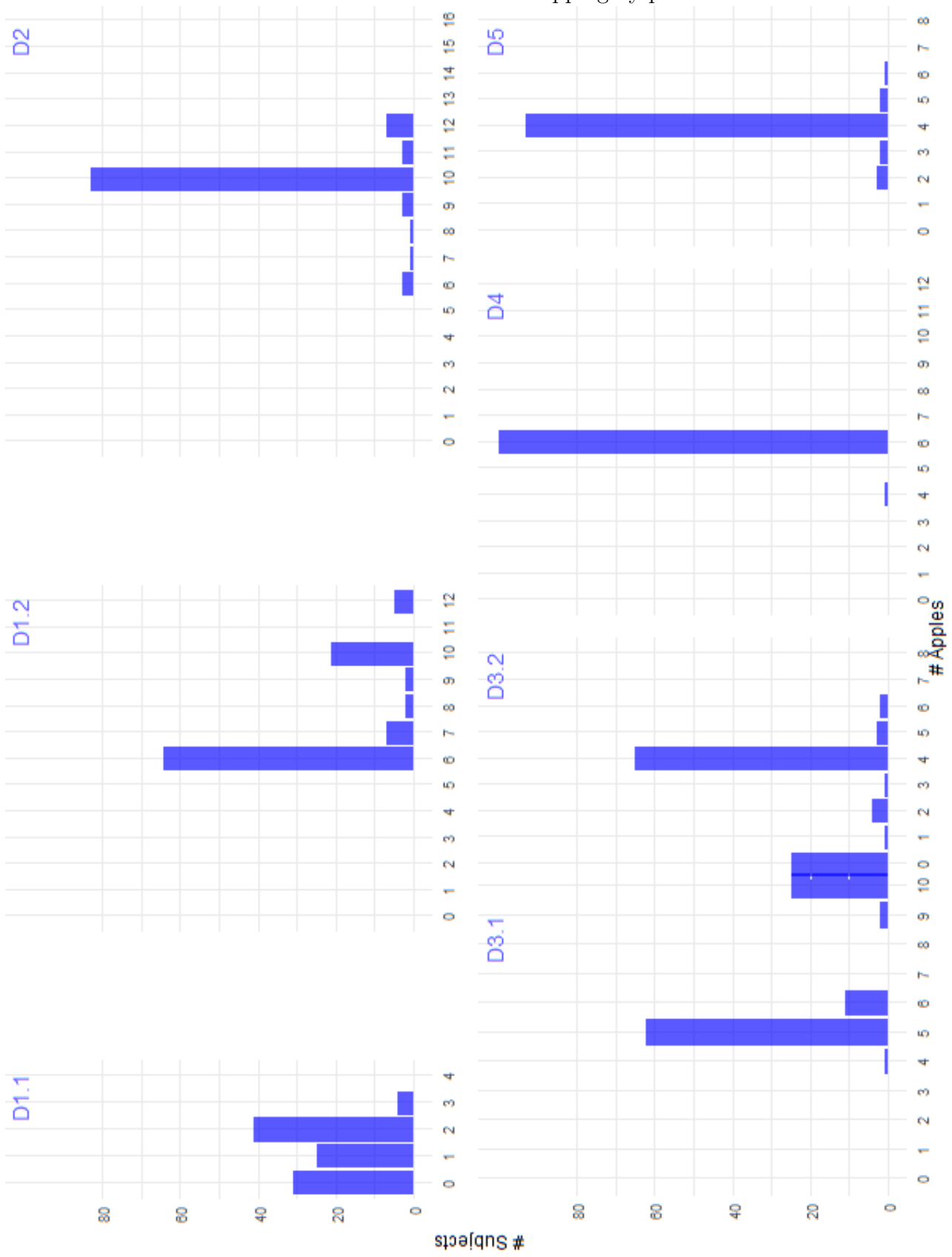


FIGURE 5. Comparison of identical parts

Shopping Experiment. Figure 6 plots histograms of purchases in each part. The histograms for D2, D4, and D5, which each have a single part, show very good adherence to value maximization: 91% of these allocations maximize payoffs exactly, and there are only 4 allocations (all in D2) in which subjects are more than two errors from the optimal allocation. The histograms for D1.1, D1.2, D3.1, and D3.2 illustrate close adherence to the predictions of full narrow bracketing with the exception that many subjects purchase two apples in D1.1 when narrow bracketing predicts they should buy only one,[40] and broad bracketing implies they should buy no apples.

[40]Note that since the price of oranges is half that of apples in D1.1 and lines correspond to numbers of oranges here, this counts as two errors relative to the narrow bracketing prediction. For a narrow bracketer, this is a very "small" mistake in terms of narrowly-assessed payoffs.

FIGURE 6. Allocations in Shopping by part



Further notes. With the exception of the output for the symmetric BB-SARP, NB-SARP, and PNB and PNBPE Algorithms, results in this paper were computed in R (R Core Team, 2020), and made use of the tidyr package (Wickham & Henry, 2020). Plots generated using ggplot2 (Wickham, 2016) and ggpubr (Kassambara, 2020).

Appendix C. Tests Assuming Symmetry

C.1. **Testable conditions.** We present the following testable implications of narrow, broad, and partial-narrow bracketing when underlying preferences are required to be symmetric.

Prediction 4 (NB-Sym)**.** Suppose $\mathcal{D}$ is rationalized by symmetric narrow bracketing and each $B^{t,k}$ is a Walrasian budget set for prices $p^{t,k}$.
If $p_j^{t,k} \geq p_i^{t,k}$, then $x_i^{t,k} \geq x_j^{t,k}$.

With narrow bracketing, symmetry's implications are straightforward. The subject should purchase at least as much of the cheaper good. With broad and partial-narrow bracketing, the implications are more subtle.

Prediction 5 (BB-Sym)**.** Suppose $\mathcal{D}$ is rationalized by symmetric broad bracketing, and each $B^{t,k}$ is a Walrasian budget set for prices $p^{t,k}$ and income $I^{t,k}$. Then,
(i) if $B^t = B^{t,1} + B^{t,2}$,$p_1^{t,1} = p_2^{t,1}$, and $p_i^{t,2} > p_j^{t,2}$, then $x_i^{t,1} + x_i^{t,2} \leq x_j^{t,1} + x_j^{t,2}$; if in addition $\frac{I^{t,2}}{p_j^{t,2}} \leq \frac{I^{t,1}}{p_i^{t,1}}$, then $x_i^{t,2} = 0$, and
(ii) if $B^t = B^{t,1}$ and $p_i^{t,1} \geq p_j^{t,1}$, then $x_j^{t,1} \geq x_i^{t,1}$.

Prediction 6 (PNB-Sym)**.** Suppose $\mathcal{D}$ is rationalized by symmetric partial-narrow bracketing and each $B^{t,k}$ is a Walrasian budget set for prices $p^{t,k}$. Then,
(i) if $B^t = B^{t,1} + B^{t,2}$, $p_1^{t,1} = p_2^{t,1}$ and $p_i^{t,2} > p_j^{t,2}$, then $x_j^{t,2} \geq x_i^{t,2}$ and $x_j^t \geq x_i^t$, and
(ii) if $B^t = B^{t,1}$ and $p_1^{t,1} \geq p_2^{t,1}$, then $x_2^{t,1} \geq x_1^{t,1}$.

For an intuition, recall the logic of comparative advantage. The opportunity cost of consuming good i from $B^{t,1}$ is lower than in $B^{t,2}$, and vice versa for consuming good j. A DM should purchase at least as much of the good in the part where it is cheapest relative to the other good. With broad bracketing, this specialization is extreme: if a subject purchases positive amounts of good i from the second part, then they must exhaust the budget of the first on good i. Otherwise, they forgo the opportunity to consume more of each. The DM purchases the good only where it is cheapest, until switching to purchasing the other good. With partial-narrow, the specialization is less extreme as the DM weighs the effect of less consumption of the more expensive good in the part as well as in the decision overall.

C.2. **Tests of NB-, BB-, and PNB-Sym.** Symmetric preferences are natural in our experimental setup, and in the decisions with equal prices, such as Decision 2, the majority of subjects allocate evenly. By testing this property's implications in other choices, we obtain more powerful tests that do not rely on cross-decision comparisons. This power comes at the cost of having to jointly test bracketing and that underlying preferences are symmetric. To the extent that these properties are compelling in our environment, the next set of tests distinguish the three models of bracketing.

	Risk			Social		
# errors	0	1	2	0	1	2
NB-Sym (D1)	62	73	84	41	72	82
NB-Sym (D3)	60	74	82	34	76	82
NB-Sym (both)	46	57	65	22	46	67
BB-Sym (D1)	1	1	1	11	11	12
BB-Sym (D3)	6	7	8	14	14	14
BB-Sym (both)	0	0	0	10	10	10
PNB-Sym (D1)	90	92	93	63	95	99
PNB-Sym (D3)	91	94	96	67	96	97
PNB-Sym (both)	86	88	92	46	77	93
# subjects	99			102		

Entries count the # of subjects who pass each test at the listed error allowance.

TABLE 8. Tests of NB-, BB-, and PNB-Sym

We thus test NB-Sym, BB-Sym, and PNB-Sym, using all of each condition's implications for a given decision. In Decision 1 tests, we find that 63% and 40% of subjects pass NB-Sym in the Risk and Social Experiments respectively. These pass rates increase to 74% and 71% if we allow for one error. We find quantitatively similar results for Decision 3. Pass rates go down to 46% and 22% when we require a subject to pass NB-Sym in both Decisions 1 and 3 – but these numbers increase to 58% and 45% when we allow for one error across both decisions. Thus most, but not all, subjects pass this test of the conjunction of narrow bracketing with symmetric preferences.

Turning to tests of broad bracketing, 1% and 11% of subjects pass BB-Sym in Decision 1 of the Risk and Social Experiments respectively. Allowing for one error does not increase pass rates at all, though one additional subject is within two errors of passing. We obtain slightly higher pass rates (6% and 14%) in Decision 3. This discrepancy can be traced to the relative strength of BB-Sym in these decisions. It makes a point prediction in Decision 1 but allows two possible choices in Decision 3. No subjects pass BB-Sym in both Decisions 1 and 3 for Risk, even when allowing for two errors. In Social, 10% of subjects pass, which does not change when allowing for up to two errors. Thus these tests suggest that only a small minority of subjects are close to consistent with broad bracketing.

Our PNB-Sym tests of partial-narrow bracketing have higher pass rates, as expected – 91% and 62% for Risk and Social Experiments respectively in Decision 1. Allowing one error raises pass rates to include the vast majority of subjects – 93% and 93% respectively. We obtain quantitatively similar results for Decision 3. However, allowing one error, only 18% and 12% pass PNB-Sym and neither BB-Sym nor NB-Sym in Decision 1 in the two experiments. We find that 87% and 45% pass PNB-Sym in both decisions, while 89% and 75% do so when allowing for one error. However, this means that, when allowing for one error of tolerance, only 31% and 20% of subjects pass PNB-Sym in both Decision 1 and 3 who pass neither BB-Sym nor NB-Sym. Thus, partial-narrow bracketing only somewhat helps to account for behavior in our experiments, in spite of the model's relatively weak implications in our experiment without parametric assumptions about utility.

Result 4. *When allowing for one error in the Risk and Social Experiments, 58% and 45% of subjects pass NB-Sym and 0% and 10% pass BB-Sym; only 31% and 20% pass PNB-Sym but not NB- nor BB-Sym.*

Appendix D. Power

For each test presented in Tables 3, 4, and 5 we compute the probability that randomly-generated choices would pass each. This approach to analyzing the power of revealed preference tests follows Bronars (1987), and has been used in Andreoni & Miller (2002, p. 744) and Choi *et al.* (2007, p. 1927), among other papers.

	Risk/Social		
# errors	0	1	2
NB-WARP (D1.1 and D5)	0.091	0.256	0.405
NB-WARP (D1.2 and D4))	0.059	0.170	0.273
NB-WARP (D3.2 and D5)	0.091	0.256	0.405
NB-WARP (D1.1 and D3.2)	0.091	0.256	0.405
NB-WARP (all)	0.0005	0.004	0.014
BB-WARP (D1 and D2)	0.427	0.517	0.591
BB-Mon (D1)	0.144	0.278	0.401
BB-Mon (D3)	0.174	0.331	0.471
BB-Mon (both)	0.025	0.071	0.134

Table 9. Probability of Random Choice Passing NB-/BB- WARP tests

	Risk/Social		
# errors	0	1	2
NB-SARP	9×10^{-8}	1×10^{-6}	1×10^{-5}
BB-SARP	1×10^{-6}	1×10^{-5}	5×10^{-5}
PNB	6×10^{-4}	3×10^{-3}	9×10^{-3}
PNB-PE	2×10^{-3}	1×10^{-2}	3×10^{-2}

Table 10. Probability of Random Choice Passing Full Tests

	D1			D3		
# errors	0	1	2	0	1	2
NB	0.009	0.043	0.111	0.007	0.035	0.091
BB	0.009	0.034	0.077	0.007	0.021	0.042
PNB	0.043	0.179	0.333	0.035	0.126	0.224
PNB-PE	0.043	0.179	0.333	0.041	0.147	0.238

	Both			Full		
# errors	0	1	2	0	1	2
NB	6×10^{-5}	5×10^{-4}	0.002	2×10^{-8}	3×10^{-7}	2×10^{-6}
BB	6×10^{-5}	4×10^{-4}	0.001	2×10^{-8}	2×10^{-7}	2×10^{-6}
PNB	5×10^{-4}	0.003	0.011	2×10^{-7}	2×10^{-6}	1×10^{-5}
PNB-PE	6×10^{-4}	0.004	0.012	2×10^{-7}	3×10^{-6}	2×10^{-5}

TABLE 11. Probability of Random Choice Passing each Shopping Test

APPENDIX E. EXTREMENESS AVERSION

In our Social/Risk experiments, BB-Mon requires extreme allocations in D1 and D3. In D1 (D3), it requires that either that all 10 tokens are allocated to person/asset B (B/D) in D1.1 (D3.2) when it offers a better return for the same price, or that no tokens are allocated to person/asset B (D) in D1.2 (D3.1).[41] In the main text, we say that a subject is consistent with *Extremeness-Averse (EA-)BB-Mon* if they are within 2 tokens of making an extreme allocation in those both of those two decisions. We picked 2 tokens because about a third of possible allocations are consistent with 3 tokens of slack but no errors, while more than half the choice space (12,055 out of 22,627 possible allocations) are consistent with 3 tokens of "slack" when allowing for 2 errors.

In our pen-and-paper shopping experiment, D3 requires two corner choices, while D1 only requires one corner choice. If extremeness aversion drove our results, we would expect more people consistent with broad bracketing in D1 than in D3. However, the rates of broad bracketing are similar across the two decisions, with between 20-27 subjects in D1 and either 23 or 24 subjects in D3 consistent with broad bracketing. The difference is not statistically

[41]Narrow bracketing predicts that at least 5 should go to asset/person B. All other subjects were at least as close to the narrow bracketing predictions as to broad bracketing predictions.

TABLE 12. Percent of all allocations consistent with EA-BB-Mon

	0 errors	1 errors	2 errors	3 errors	4 errors
0 slack	2.5	7.1	13.4	20.9	29.4
1 slack	9.2	17.2	26.1	35.5	45.2
2 slack	18.9	29.2	39.6	50.0	60.0
3 slack	30.5	42.1	53.3	63.8	73.3
4 slack	43.2	55.2	66.2	76.1	84.5
5 slack	56.0	67.6	77.8	86.4	93.1

Each cell indicates percentage of all possible allocations consistent with EA-BB-Mon in both D1 and D3 at indicated level of slack and error allowance in Social and Risk experiments.

TABLE 13. EA-BB-Mon in Risk

	BB-Mon			EA-BB-Mon			n
	0 errors	1 errors	2 errors	0 errors	1 errors	2 errors	
all	7	8	10	10	15	24	99
0 errors NB-SARP	1	1	1	1	1	2	23
1 errors NB-SARP	1	1	1	1	1	3	34
2 errors NB-SARP	1	1	1	1	1	4	43
Classified NB	3	3	3	3	5	9	77

Each cell indicates number of subjects within the subgroup indicated by first column that pass the test in first row with number of errors in second row.

TABLE 14. EA-BB-Mon in Social

	BB-Mon			EA-BB-Mon			n
	0 errors	1 errors	2 errors	0 errors	1 errors	2 errors	
all	12	12	12	12	13	15	102
0 errors NB-SARP	1	1	1	1	1	2	15
1 errors NB-SARP	1	1	1	1	1	2	36
2 errors NB-SARP	1	1	1	1	1	2	44
Classified NB	2	2	2	2	2	3	77

Each cell indicates number of subjects within the subgroup indicated by first column that pass the test in first row with number of errors in second row.

significant when allowing for either 0, 1, or 2 errors (all p-values greater than 0.7, Fisher's exact test). Again, this suggests that extremeness aversion does not affect the fraction of broad bracketers by too much.

Appendix F. Order effects

We varied the order of both the overall decisions and of the parts within each two-part decision (see Table 15). Subjects in the lab sessions either completed decisions in order D1-D5 or in order D4, D3, D2, D1, D5.[42] We perform every pairwise test of the effect of the order in which decisions were faced separately for each experiment, comparing sessions who completed that decision earlier to those who completed it later (Table 16). Every such rank-sum test yields a p-value exceeding 0.10 with the exceptions of D1.2 and D2 in the Shopping Experiment ($p = 0.07, 0.02$ respectively). We performed 21 such tests, did not hypothesize the existence of order effects, and standard corrections (like the Bonferroni correction) for multiple hypothesis testing would render these tests insignificant. We thus attribute these differences to sampling variation, though the former difference may reflect learning.

We also varied the order of parts within each of the multi-part decisions, D1 and D3, and performed rank-sum tests of whether order affects allocations, separately for each part. Two of these 12 tests return a p-value < 0.05, the D1.1 test for Risk ($p = 0.02$) and the D3.2 test for Social ($p = 0.05$).[43] We did not hypothesize any order effects and standard corrections for multiple testing would render these insignificant. Again, this is probably due to sampling variation.[44]

[42]There were 6 subjects in Social who completed a different order due to a printing error, but we saw no reason to exclude these subjects from the analysis. The order was fully randomized in online sessions.

[43]One might conjecture that some subjects first narrowly bracket their choice in the the first part they face, and then select a broadly-bracketed best-reply to their previous choice in the second part they face. This is most cleanly tested using order variation in our Shopping Experiment, and we illustrate with reference to D3. In D3, a subject who faced Part 1 first would buy 5 of each fruit in Part 1 and then best-reply to that in Part 2 by buying 2 apples and 9 oranges – only 1 of 50 subjects does this. A subject who faced Part 2 first would buy 4 apples and 6 oranges in it, then reply with 6 apples and 4 oranges in Part 1 – only 6 of 51 subjects do this. This suggests that the heuristic of narrow bracketing in the first part faced, then best-replying in the second part faced, cannot explain many subjects' decisions in our setting.

[44]The median allocations are the same for both orders of the parts for each of D1.1, D1.2, D3.1, and D3.2 in both Risk and Social. Mean allocations in Risk to Asset A in D1.1 are 3.5 when Part 1 is first vs. 4.3 when Part 2 is first. But in Social, the mean allocation to A in D1.1 is 4.7 for both order variations. And in Risk, we see an effect in the opposite direction in D3.2: the mean allocation of is 3.7 to Asset C when Part 2 is first versus 3.3 when Part 1 is first. In contrast, in D3.2 of Social, the mean allocation is 4.1 to A when Part 2 is first versus 5.0 when Part 2 is second. The lack of consistency of these effects both within each experiment and when comparing a part in Risk to the same part Social suggests that these effects do not merit a systematic explanation.

TABLE 15. Orders

Order		Risk	Social	Shopping
(D1.1,D1.2), D2, (D3.1,D3.2), D4, D5	1M	14	24	15
(D1.2,D1.1), D2, (D3.1,D3.2), D4, D5	1L	16	14	15
(D1.1,D1.2), D2, (D3.2,D3.1), D4, D5	1H	19	15	17
(D3.2,D3.1), D2, (D1.1,D1.2), D4, D5	2X[45]	0	6	0
D4, (D3.2,D3.1), D2, (D1.2,D1.1), D5	2F	15	14	16
D4, (D3.1,D3.2), D2, (D1.2,D1.1), D5	2L	18	16	20
D4, (D3.2,D3.1), D2, (D1.1,D1.2), D5	2H	17	13	18
Total		99	102	101

TABLE 16. Tests of Order Effects

Order Comparison	Risk, medians			Social, medians			Shopping, medians		
	O1	O2	p-value	O1	O2	p-value	O1	O2	p-value
D1.1, Orders O1 vs O2	4	4	0.37	5	5	0.14	1	1	0.32
D1.2, Orders O1 vs O2	8	8	0.21	8	8	0.44	6	6	0.07
D2, Orders O1 vs O2	7	7	0.69	7	7	0.62	10	10	0.02
D3.1, Orders O1 vs O2	5	5	0.76	5	5	0.98	5	5	0.23
D3.2, Orders O1 vs O2	4	4	0.17	5	5	0.95	4	4	0.17
D4, Orders O1 vs O2	8	8	1.00	8	8	0.30	6	6	0.36
D5, Orders O1 vs O2	4	4	0.17	5	5	0.65	4	4	0.49
D1.1, order of parts	4	4	0.02	5	5	0.71	2	1	0.23
D1.2, order of parts	8	8	0.55	8	8	0.43	6	6	0.81
D3.1, order of parts	5	5	0.33	5	5	0.59	5	5	0.68
D3.2, order of parts	4	4	0.27	5	5	0.05	4	4	0.71

Entries for p-values are for a rank-sum test of the null hypothesis of the same distribution of allocations in the two orders. The first 7 tests compared 1L, 1H, and 1M allocations to 2L, 2H, 2F, 2X allocations. The D1.1, order of parts test compares allocations in D1.1 in orders in which D1.1 comes before D1.2 to orders in which D1.2 comes first (i.e. 1M, 1H, 2H, 2X vs. 1L, 2L, 2F); remaining order of parts tests are analogous.

One might hypothesize that some subjects learn make decisions that are more consistent with broad bracketing in the second two-budget-set round they face. We test this more directly using Shopping Experiment data, by comparing the number of errors a subject makes in each of D1 and D3 relative to optimal decisions implied by broad bracketing with the induced value function. 51 subjects deviate less severely from broad bracketing in the second two-part round than in the first, while 36 exhibit the opposite pattern ($p = 0.13$,

[45]Note that order 2X was unintended: it was printed, and run, due to a copy-and-paste error. However, we saw no reason to exclude it from our analysis.

sign test); the average difference is 1.20 fewer errors in the second two-part round ($p = 0.01$, paired t-test). This suggests that such learning effects are relatively small.

Appendix G. Relation to Preregistration Plan

We preregistered analysis plans for the Risk, Social, and Shopping Experiments online (https://osf.io/5wzrg, https://osf.io/362py, https://osf.io/8mraq)

Compared to our preregistrations for Risk and Social, we proposed "risk/inequity averse" preferences, but we instead used symmetric. In our setting, risk/inequity aversion implies symmetry but not vice versa. Our NB-SARP and BB-SARP tests are the direct tests mentioned; both assume strict symmetric preferences. Where we mentioned "GARP" in the preregistration plan for partial-narrow bracketing, we should have said "SARP." This should be clear since our experiment is designed to have power to perform SARP but not GARP tests.

In our classification, we did not include expected value/risk-seeking/linear preferences as a separate category. We note that choices consistent with such preferences are rare, and linear preferences have low predictive power. Thus including this as a separate category would not substantially affect our classification.

Our preregistration for Shopping indicated a plan to apply similar WARP-style test as for Risk and Social. After reflection, we decided that since we had induced the payoff function, it made more conceptual sense to apply the direct tests that use that information rather than WARP/GARP tests. The approach in the paper allows sharper conclusions,

Appendix H. Experimental Materials

We provide instructions and quizzes for all experiments, sample decision sheets for each, and the payoff table for the Shopping Experiment. An experimental round of choices was stapled together with the cover sheet on the first page.

FIGURE 7. Risk: Instructions

Investment task

There will be five rounds of the investment task. The first page of each round will announce the number of accounts in that round. At the end of each round, raise your hand so that the experimenter can collect your decisions and give you the decision sheet for the next round. At the end of all rounds, one round will be randomly selected to be the "round that counts". You will be paid your earnings from the round that counts based on (and only based on) your decisions in that round. Since any round could be the round that counts, you should behave in each round as if it is the round that counts.

In each round of this task, you will buy risky investments in up to two different "investment accounts". Each investment generates a return that depends on a roll of a six-sided dice. You have a separate budget for each account that can be spent only in that account. The dice will be rolled once, and you receive the returns from all your investments in all accounts in that round.

Example

As an example, suppose that in the round-that-counts you have two accounts.

You have 20 ECU in Account 1, which has two investments available; each investment costs 1 ECU per unit.

One unit in Asset A pays

\$0.40 if the dice roll is 1, 2, or 3;

\$0.10 if the dice roll is 4, 5, or 6.

One unit in Asset B pays

\$0.25 if the dice roll is 1, 2, or 3;

\$0.25 if the dice roll is 4, 5, or 6.

You have 15 ECU in Account 2, which has two investments available; each investment costs 1 ECU per unit.

One unit in Asset C pays

\$0.60 if the dice roll is 1 or 2;

\$0.00 if the dice roll is 3, 4, 5, or 6.

One unit in Asset D pays

\$0.30 if the dice roll is 1 or 2;

\$0.30 if the dice roll is 3, 4, 5, or 6.

Suppose that

In Account 1: you allocate 5 ECU to Asset A and 15 ECU to Asset B;

In Account 2: you allocate 8 ECU to Asset C and 7 ECU to Asset D.

Then, if the dice roll is **2**, you will be paid:

$$5 \times \$0.40 + 15 \times \$0.25 + 8 \times \$0.60 + 7 \times \$0.30 = \$12.65.$$

FIGURE 8. Risk: Quiz

Please answer the following questions and raise your hand after you have done so.

Question.

Suppose that a round has two accounts. Do your purchases in Account 1 affect what items you can afford to purchase in Account 2?

YES / NO (highlight one)

Question.

Suppose that in a round of the experiment has two accounts. Account 1 has two assets available, A and B. Account 2 has two different assets available, C and D.

Each unit of Asset A pays $0.50 if the dice roll is 1 or 2 and $1.00 if the dice roll is 3, 4, 5, or 6;

Each unit of Asset B pays $1.00 if the dice roll is 1 or 2 and $0.50 if the dice roll is 3, 4, 5, or 6.

Each unit of Asset C pays $0.50 if the dice roll is 1 or 2 and $0.00 if the dice roll is 3, 4, 5, or 6;

Each unit of Asset D pays $0.00 if the dice roll 1 or 2 and $1.00 if the dice roll is 3, 4, 5, or 6.

Suppose that you invest as follows:

in Account 1, you invest 2 ECU in Asset A and 6 ECU in Asset B;

in Account 2, you invest 4 ECU in Asset C and 2 ECU in Asset D.

1. If this round determines your payment, then how much will you earn if the dice roll is 2?

   _____

2. If this round determines your payment, then how much will you earn if the dice roll is 6?

   _____

FIGURE 9. Risk: Cover Sheet for Round 1 (order 1M)

Subject # Session

Round 1

In round 1, you have 2 investment accounts.

FIGURE 10. Risk: D1.1 Decision Sheet

Investment Account 1

You have **10 ECU** available in Account 1. Two assets are available for purchase, Asset A and Asset B.

The price of Asset A is **1 ECU per unit**.

The price of Asset B is **1 ECU per unit**.

One unit in Asset A pays

$1.00 if the dice roll is 1, 2, or 3;

$0.00 if the dice roll is 4, 5, or 6.

One unit in Asset B pays

$0.00 if the dice roll is 1, 2, or 3;

$1.20 if the dice roll is 4, 5, or 6.

Please highlight a feasible combination of purchases of Asset A and Asset B from the list below.

0 units of Asset A and 10 units of Asset B.

1 unit of Asset A and 9 units of Asset B.

2 units of Asset A and 8 units of Asset B.

3 units of Asset A and 7 units of Asset B.

4 units of Asset A and 6 units of Asset B.

5 units of Asset A and 5 units of Asset B.

6 units of Asset A and 4 units of Asset B.

7 units of Asset A and 3 units of Asset B.

8 units of Asset A and 2 units of Asset B.

9 units of Asset A and 1 unit of Asset B.

10 units of Asset A and 0 units of Asset B.

FIGURE 11. Risk: D1.1 Decision Sheet

Investment Account 2

You have **16 ECU** available in Account 2. Two assets are available for purchase, Asset C and Asset D.

The price of Asset C is **1 ECU per unit**.

The price of Asset D is **1 ECU per unit**.

One unit in Asset C pays

\$1.00 if the dice roll is 1, 2, or 3;

\$0.00 if the dice roll is 4, 5, or 6.

One unit in Asset D pays

\$0.00 if the dice roll is 1, 2, or 3;

\$1.00 if the dice roll is 4, 5, or 6.

Please highlight a feasible combination of purchases of Asset C and Asset D from the list below.

0 units of Asset C and 16 units of Asset D.

1 unit of Asset C and 15 units of Asset D.

2 units of Asset C and 14 units of Asset D.

3 units of Asset C and 13 units of Asset D.

4 units of Asset C and 12 units of Asset D.

5 units of Asset C and 11 units of Asset D.

6 units of Asset C and 10 units of Asset D.

7 units of Asset C and 9 units of Asset D.

8 units of Asset C and 8 units of Asset D.

9 units of Asset C and 7 units of Asset D.

10 units of Asset C and 6 units of Asset D.

11 units of Asset C and 5 units of Asset D.

12 units of Asset C and 4 units of Asset D.

13 units of Asset C and 3 units of Asset D.

14 units of Asset C and 2 units of Asset D.

15 units of Asset C and 1 unit of Asset D.

16 units of Asset C and 0 units of Asset D.

FIGURE 12. Social: Instructions

Division task

There will be five rounds of a task where you will asked to allocate tokens between two other participants who will herein be labelled "person A" and "person B". They will not be told your identity, and you will not be told their identities. That is, you will remain completely anonymous to each other.

In each round of this task, you will have tokens in up to two different accounts. You decide how to allocate tokens between person A and person B in each account. The value per token allocated to each of A and B may vary across rounds and across accounts. You have a separate budget of tokens for each account that can be allocated only in that account. Payments for a given round will be determined by the sum of the value of all tokens allocated in all accounts in that round.

The first page of each round will announce the number of accounts in that round. At the end of each round, raise your hand so that the experimenter can collect your decisions and give you the decision sheet for the next round.

You and every other participant has numbered a sealed envelope at the beginning of the experiment. Each participant has been randomly allocated to a group and role (A or B); this is recorded in the envelope. The round that counts to determine your payment has also been randomly selected and recorded in each envelope. Your group has been randomly and anonymously matched to determine the payment of another group and one round of your choices will determine the earnings of person A and person B in that group. Since each round could be the round that counts and actually determines a two other subjects' payments, you should treat each round as if it is the round that counts.

Example

As an example, suppose that in the round-that-counts there are two accounts.

There are 10 tokens in Account 1.

One token is worth \$0.80 to A and \$0.60 to B.

There are 12 tokens in Account 2.

One token pays \$1.00 to A and \$0.20 to B.

Suppose that

In Account 1: you allocate 4 tokens to A and 6 tokens to B.

In Account 2: you allocate 2 tokens to A and 10 tokens to B.

Then,

A's earnings are $4 \times \$0.80 + 2 \times \$1.00 = \$5.20$;

B's earnings are $6 \times \$0.60 + 10 \times \$0.20 = \$5.60$.

FIGURE 13. Social: Quiz

Please answer the following questions and raise your hand after you have done so.

Question.

Suppose that a round has two accounts. Does your allocation in Account 1 affect what you have available to allocate in Account 2?

YES / NO (highlight one)

Question.

Suppose that a round of the experiment has two accounts.

In Account 1, each token pays $0.40 to A and $0.60 to B.

In Account 2, each token pays $0.30 to A and $0.40 to B.

Suppose that you invest as follows:

in Account 1, you allocate 2 tokens to A and 4 tokens to B;

in Account 2, you allocate 6 tokens to A and 1 token to B.

1. If this is the round that counts for this group, then how much will person A receive?

   _____

2. If this is the round that counts for this group, then how much will person B receive?

   _____

FIGURE 14. Social: D5 Decision Sheet

Account 1

You have **10 tokens** available in Account 1.

Each token allocated to A is worth $1.00.

Each token allocated to B is worth $1.20.

Please highlight a feasible allocation of tokens between A and B.

0 tokens for A and 10 tokens for B.

1 token for A and 9 tokens for B.

2 tokens for A and 8 tokens for B.

3 tokens for A and 7 tokens for B.

4 tokens for A and 6 tokens for B.

5 tokens for A and 5 tokens for B.

6 tokens for A and 4 tokens for B.

7 tokens for A and 3 tokens for B.

8 tokens for A and 2 tokens for B.

9 tokens for A and 1 token for B.

10 tokens for A and 0 tokens for B.

FIGURE 15. Shopping: Instructions

Shopping Task

There will be five rounds of the shopping task. At the end of all rounds of the experiment, one round will be randomly selected to be the "round that counts". You will be paid your earnings from the round that counts based on (and only based on) your decisions in that round. Since any round could be the round that counts, you should behave in each round as if it is the round that counts.

In each round of this task, you will buy up to two different fictitious "fruits" at up to two "stores". You have a separate gift certificate (denominated in experimental currency units – ECUs) at each store that can be spent only at that store. However, your monetary earnings for the experiment are based on the total amount of each fruit in your final bundle for a round after you have completed your shopping at all stores.

The first page of each round will announce the number of stores in that round. At the end of each round, raise your hand so that the experimenter can collect your decisions and give you the decision sheet for the next round.

How Your Payment is Determined

Your monetary payment will be calculated from your final bundle in the round that counts according to the function

$$Payment = \frac{2}{5}\left(\sqrt{\#apples} + \sqrt{\#oranges}\right)^2.$$

To help you calculate the payment you would receive for a final bundle, we have provided tables at the end of the experiment that indicates the payment that would result from all possible final bundles (and some impossible ones).

As an example of how your payment will be calculated, suppose you buy:

1 apple and 5 oranges at Store 1,

2 apples and 6 oranges at Store 2.

Then your final bundle is

3 apples and 11 oranges.

To calculate your payment locate the entry in the "3 apples" column and the "11 oranges" row of the payment table.

Notice three features of the payment table:

(i) A final bundle with more of every fruit earns a higher payment.
(ii) A mix of fruits earns a higher payment: a final bundle with 5 apples and 5 oranges earns you a higher payment than a final bundle with 8 apples and 2 oranges, which in turn earns a higher payment than a final bundle with 10 apples and 0 oranges.
(iii) A final bundle with 7 apples and 3 oranges earns the same final payment as a final bundle with 3 apples and 7 oranges.

If the prices of apples and oranges are not the same, you thus face a trade-off between buying as many units of fruit as possible versus buying a mix that includes both fruits.

FIGURE 16. Shopping: Quiz

How to Shop in each Store

You will have a separate gift certificate at each store denominated in Experimental Currency Units (ECUs). The page for each store will present you with the prices of the fruits in that store. You must highlight one of the feasible apple-orange-watermelon combinations at each store to spend your gift certificate. Feasible combinations will be denoted in a list. If that combination does not appear in the, then it is not affordable with your gift certificate at that store.

To illustrate how you make your decision in each store, consider the following hypothetical store; you have a 6 ECU gift certificate for this store, and apples and oranges each cost 1 ECU per unit of fruit. Then your store page will be laid out as follows.

Store

You have a **6 ECU** gift certificate to spend.

The price of apples is **1 ECU per apple**.

The price of oranges is **1 ECU per orange**.

Please highlight a feasible combination of apples and oranges from the list below to make your purchase from this store.

0 apples and 6 oranges.

1 apple and 5 oranges.

2 apples and 4 oranges.

3 apples and 3 oranges.

4 apples and 2 oranges.

5 apples and 1 orange.

6 apples and 0 oranges.

Question 1.

How much would you earn if a round with only the store above was the round that counts, and you had chosen the bundle you indicated above?

Question 2.

Suppose that the round that counts had two stores. In Store 1, you bought 1 apple and 4 oranges. In store 2, you bought 3 apples and 5 oranges. What would your earnings be for the experiment?

FIGURE 17. Shopping: D3.2 Decision Sheet

Store 2

You have a **24 ECU** gift certificate at Store 2.

The price of apples is **3 ECU per apple**.

The price of oranges is **2 ECU per orange**.

Please highlight a feasible combination of apples and oranges from the list below to make your purchase from this store.

0 apples and 12 oranges.

0 apples and 11 oranges.

1 apple and 10 oranges.

2 apples and 9 oranges.

2 apples and 8 oranges.

3 apples and 7 oranges.

4 apples and 6 oranges.

4 apples and 5 oranges.

5 apples and 4 oranges.

6 apples and 3 oranges.

6 apples and 2 oranges.

7 apples and 1 orange.

8 apples and 0 oranges.

Figure 18. Shopping Payoff Table

	0 apples	1 apple	2 apples	3 apples	4 apples	5 apples	6 apples	7 apples	8 apples	9 apples	10 apples	11 apples	12 apples	13 apples	14 apples	15 apples	16 apples	17 apples	18 apples	19 apples	20 apples	21 apples	22 apples
0 oranges	0.00	0.40	0.80	1.20	1.60	2.00	2.40	2.80	3.20	3.60	4.00	4.40	4.80	5.20	5.60	6.00	6.40	6.80	7.20	7.60	8.00	8.40	8.80
1 orange	0.40	1.60	2.33	2.99	3.60	4.19	4.76	5.32	5.86	6.40	6.93	7.45	7.97	8.48	8.99	9.50	10.00	10.50	10.99	11.49	11.98	12.47	12.95
2 oranges	0.80	2.33	3.20	3.96	4.66	5.33	5.97	6.59	7.20	7.79	8.38	8.95	9.52	10.08	10.63	11.18	11.73	12.26	12.80	13.33	13.86	14.38	14.91
3 oranges	1.20	2.99	3.96	4.80	5.57	6.30	6.99	7.67	8.32	8.96	9.58	10.20	10.80	11.40	11.98	12.57	13.14	13.71	14.28	14.84	15.40	15.95	16.50
4 oranges	1.60	3.60	4.66	5.57	6.40	7.18	7.92	8.63	9.33	10.00	10.66	11.31	11.94	12.57	13.19	13.80	14.40	15.00	15.59	16.17	16.76	17.33	17.90
5 oranges	2.00	4.19	5.33	6.30	7.18	8.00	8.78	9.53	10.26	10.97	11.66	12.33	13.00	13.65	14.29	14.93	15.56	16.18	16.79	17.40	18.00	18.60	19.19
6 oranges	2.40	4.76	5.97	6.99	7.92	8.78	9.60	10.38	11.14	11.88	12.60	13.30	13.99	14.67	15.33	15.99	16.64	17.28	17.91	18.54	19.16	19.78	20.39
7 oranges	2.80	5.32	6.59	7.67	8.63	9.53	10.38	11.20	11.99	12.75	13.49	14.22	14.93	15.63	16.32	17.00	17.67	18.33	18.98	19.63	20.27	20.90	21.53
8 oranges	3.20	5.86	7.20	8.32	9.33	10.26	11.14	11.99	12.80	13.59	14.36	15.10	15.84	16.56	17.27	17.96	18.65	19.33	20.00	20.66	21.32	21.97	22.61
9 oranges	3.60	6.40	7.79	8.96	10.00	10.97	11.88	12.75	13.59	14.40	15.19	15.96	16.71	17.45	18.18	18.90	19.60	20.30	20.98	21.66	22.33	23.00	23.66
10 oranges	4.00	6.93	8.38	9.58	10.66	11.66	12.60	13.49	14.36	15.19	16.00	16.79	17.56	18.32	19.07	19.80	20.52	21.23	21.93	22.63	23.31	23.99	24.67
11 oranges	4.40	7.45	8.95	10.20	11.31	12.33	13.30	14.22	15.10	15.96	16.79	17.60	18.39	19.17	19.93	20.68	21.41	22.14	22.86	23.57	24.27	24.96	25.65
12 oranges	4.80	7.97	9.52	10.80	11.94	13.00	13.99	14.93	15.84	16.71	17.56	18.39	19.20	19.99	20.77	21.53	22.29	23.03	23.76	24.48	25.19	25.90	26.60
13 oranges	5.20	8.48	10.08	11.40	12.57	13.65	14.67	15.63	16.56	17.45	18.32	19.17	19.99	20.80	21.59	22.37	23.14	23.89	24.64	25.37	26.10	26.82	27.53
14 oranges	5.60	8.99	10.63	11.98	13.19	14.29	15.33	16.32	17.27	18.18	19.07	19.93	20.77	21.59	22.40	23.19	23.97	24.74	25.50	26.25	26.99	27.72	28.44
15 oranges	6.00	9.50	11.18	12.57	13.80	14.93	15.99	17.00	17.96	18.90	19.80	20.68	21.53	22.37	23.19	24.00	24.79	25.57	26.35	27.11	27.86	28.60	29.33
16 oranges	6.40	10.00	11.73	13.14	14.40	15.56	16.64	17.67	18.65	19.60	20.52	21.41	22.29	23.14	23.97	24.79	25.60	26.39	27.18	27.95	28.71	29.46	30.21
17 oranges	6.80	10.50	12.26	13.71	15.00	16.18	17.28	18.33	19.33	20.30	21.23	22.14	23.03	23.89	24.74	25.57	26.39	27.20	27.99	28.78	29.55	30.32	31.07
18 oranges	7.20	10.99	12.80	14.28	15.59	16.79	17.91	18.98	20.00	20.98	21.93	22.86	23.76	24.64	25.50	26.35	27.18	27.99	28.80	29.59	30.38	31.15	31.92
19 oranges	7.60	11.49	13.33	14.84	16.17	17.40	18.54	19.63	20.66	21.66	22.63	23.57	24.48	25.37	26.25	27.11	27.95	28.78	29.59	30.40	31.19	31.98	32.76
20 oranges	8.00	11.98	13.86	15.40	16.76	18.00	19.16	20.27	21.32	22.33	23.31	24.27	25.19	26.10	26.99	27.86	28.71	29.55	30.38	31.19	32.00	32.80	33.58
21 oranges	8.40	12.47	14.38	15.95	17.33	18.60	19.78	20.90	21.97	23.00	23.99	24.96	25.90	26.82	27.72	28.60	29.46	30.32	31.15	31.98	32.80	33.60	34.40
22 oranges	8.80	12.95	14.91	16.50	17.90	19.19	20.39	21.53	22.61	23.66	24.67	25.65	26.60	27.53	28.44	29.33	30.21	31.07	31.92	32.76	33.58	34.40	35.20

Appendix I. Online Risk Experiment Results

	Tabs, Basic			Side-by-Side, Basic			Tabs, Examine			Side-by-Side, Examine		
# errors	0	1	2	0	1	2	0	1	2	0	1	2
NB-WARP (D1.1 and D5)	41	50	52	36	41	43	26	34	38	26	38	45
NB-WARP (D1.2 and D4))	43	46	47	38	43	43	34	37	39	38	42	46
NB-WARP (D3.2 and D5)	41	49	53	26	34	43	25	34	41	25	40	45
NB-WARP (D1.1 and D3.2)	40	49	53	30	37	46	27	38	44	23	39	41
NB-WARP (all)	29	36	41	21	25	36	18	28	33	16	29	36
BB-WARP (D1 and D2)	5	6	49	8	8	48	4	5	39	3	5	43
BB-Mon (D1)	2	3	6	2	2	3	5	5	8	4	4	6
BB-Mon (D3)	4	5	6	1	1	3	4	4	5	0	0	4
BB-Mon (both)	2	2	3	1	1	1	4	4	4	0	0	0
# subjects	56			50			46			48		

Entries count the # of subjects who pass test at the listed error allowance.

Table 17. Tests of NB-WARP and BB-WARP

	Tabs, Basic			Side-by-Side, Basic			Tabs, Examine			Side-by-Side, Examine		
# errors	0	1	2	0	1	2	0	1	2	0	1	2
NB-SARP	24	29	33	18	21	27	17	24	27	13	22	26
BB-SARP	0	0	0	0	0	0	1	1	2	0	0	0
PNB	31	35	41	26	31	34	27	30	33	28	32	37
PNB-PE	32	35	41	26	32	35	28	31	35	29	32	38
# subjects	56			50			46			48		

Entries count the # of subjects who pass each test at the listed error allowance.

Table 18. Full Tests of Symmetric Models

	Percent Selten Score Maximized			
	Tabs, Basic	Side-by-Side, Basic	Tabs, Examine	Side-by-Side, Examine
Broad Bracketing	0	0	2	0
Narrow Bracketing	48	41	34	45
PNB	1	0	0	0
PNB-PE	0	1	1	0
Unclassified	7	8	9	3
# subjects	56	50	46	48

TABLE 19. Classification of subjects

Appendix J. Online Shopping Experiment Results

	D1			D3			Both			Full		
# errors	0	1	2	0	1	2	0	1	2	0	1	2
NB	6	7	20	18	23	30	4	5	11	4	5	8
BB	5	5	7	4	4	4	3	3	3	3	3	3
PNB	12	15	33	23	29	37	7	9	15	7	9	12
PNB-PE	12	15	33	23	29	37	7	9	15	7	9	12
# subjects	46											

Entries count the # of subjects who pass each test at the listed error allowance.

Table 20. Shopping Tests

	Percent Selten Score Maximized Online Shopping
Broad Bracketing	5
Narrow Bracketing	33
PNB	4
PNB-PE	0
Unclassified	4
# of subjects	46

Table 21. Classification of subjects

Versions 2 and 3. When we conducted our main Online Shopping Experiment, we recruited 150 US-based subjects from Prolific Academic, randomly assigning each to one of the three treatments, with 46 assigned to the main treatment, 54 to V2, and 49 in V3. Treatment V1 is identical to the Paper one reported, without a kink in the budget of D2. The two

other versions of our Online Shopping Experiment were intended to reduce the reliance of our tests on corner solutions being optimal for a broad bracketer. In V2, we made D1.1 and D3.1 binary choices that forces each subject to pick a corner or near-corner solution (Table 22). In V3, we used the full budget set consistent with the implied prices in V2 for D1.1 and D3.1. In order to be able to distinguish between the predictions of narrow and broad bracketing, we multiplied all budgets by a factor of 4 and divided the payoff function by 4 (to retain the same stakes). Table 22 presents the budget sets used in each version.

		V1			V2			V3		
Decision	Part	I	p_a	p_o	I	p_a	p_o	I	p_a	p_o
D1	1	8	2	1	36	1 (sold only in a 30-pack)	6	36	1	6
	2	24	2	2	108	3	4	108	3	4
D2	1	40	2	2	160	2	2	160	2	2
D3	1	30	3	3	24	1 (sold only in a 24-pack)	4	24	1	4
	2	24	3	2	48	2	3	48	2	3
D4	1	12	1	1	48	1	1	48	1	1
D5	1	48	6	4	192	6	4	192	6	4

p_a: price/apple
p_o: price/orange

TABLE 22. Experimental Tasks for Online Shopping Experiments V1, V2, and V3

Unfortunately, these changes and the move to online made behavior much noisier, to the point that it is impossible to draw many conclusions from V2 and V3. In hindsight, we believe that enriching the budget space made it too difficult for a subject to efficiently use the calculator to explore the budget space, which in turn increased noise. This is seen most clearly in D5, where the optimal allocation in the original experiment and V1 is to purchase 4 apples and 6 oranges, and the optimum in V2 and V3 is to purchase 12 apples and 30 oranges (discreteness). In the original paper version, only 9% of subjects fail to make the optimal purchase, and on average, subjects are 0.20 oranges off the optimal allocation. In V1, 42%

of subjects make a mistake, being off by 1.16 oranges on average. In V2 and V3, more than 87% made a mistake and more than half were off by more than 9 oranges. Table 23 reports the fraction of optimal choices and the median and mean errors from payoff-maximization in D4 and D5.[46] These decisions are directly comparable across all versions of the experiment (noting that the budget is multiplied by 4 in V2 and V3). Strikingly, a far higher fraction of subjects make errors in all online versions, and this is especially pronounced in V2 and V3. The average magnitude of errors is also much larger in the online experiments than in the original paper experiment. This difference is consistent with previous work by Snowberg & Yariv (2021) that showed that student subjects tend to exhibit less noisy behavior than subjects recruited from a representative sample or from Mechanical Turk (which are more similar to the Prolific Academic subject pool).

	D4			D5		
	Fraction	Median	Mean	Fraction	Median	Mean
Paper	0.01	0	0.02	0.09	0	0.20
V1	0.13	0	0.26	0.41	0	1.13
V2	0.19	0	0.85	0.87	8.5	8.24
V3	0.14	0	0.53	0.90	9	8.16

Table reports the fraction of participants making an error, the median and mean number of oranges away from the optimum for the main Paper experiments and versions 1, 2, and 3 of the online experiments separately for D4 and D5.

TABLE 23. Comparing Errors

Our goal was to compare broad bracketing in V2 with broad bracketing in V3. While we attempted to perform our classification exercise with V2 and V3, the classification was much noisier. In V2, 31 of 54 subjects are unclassified, with 9 classified to broad, 5 to narrow, and 9 to partial. However, only 15 subjects were within 8 errors of any of the three models (4 classified broad, 3 narrow, and 8 partial). In V3, only 4 of 49 subjects could be classified (1 broad, 1 narrow, 2 partial). This appears to be primarily due to the higher level of noise in the online experiment. Unsurprisingly given the small sample, a Fisher's exact test of the

[46]Recall that we measure errors in terms of lines on our decision sheets in our original experiments and analogously in terms of available slider positions in our online experiments. In D4 and D5, there was one slider position for every affordable number of oranges.

hypothesis that there is no difference in the ratio of number of subjects classified as narrow to those classified as broad between V2 and V3 is insignificant, $p = 1.0$.

Table 24 reports the number of people in each treatment who are within 0, 4 and 8 errors of the optimal allocation for NB and BB. To deal with the high level of noise, we compare the ratio of people who pass NB versus BB across the two treatments. For each error allowance, we perform a separate Fisher's exact test of the hypothesis that there is no difference in the ratio of the number of subject within that allowance of narrow's prediction to the the number of subject within that allowance of broad's prediction between V2 and V3. Unsurprisingly given the small sample, we find no significant differences in the ratio between these two treatments. This further suggests that extreme avoidance is not driving our results.

	V2		V3		V2 vs. V3
# errors	NB	BB	NB	BB	p-value
0	2	0	0	0	1.00
4	3	0	0	0	1.00
8	3	3	1	0	1.00

Each entry is the number of subjects who are within that error allowance of NB/BB.

TABLE 24. V2 and V3: testing the broad to narrow bracketer ratio

Appendix K. Online Risk Experiment Screenshots

The Online Risk Experiment and Online Shopping Experiment were both programmed using oTree (Chen *et al.*, 2016).

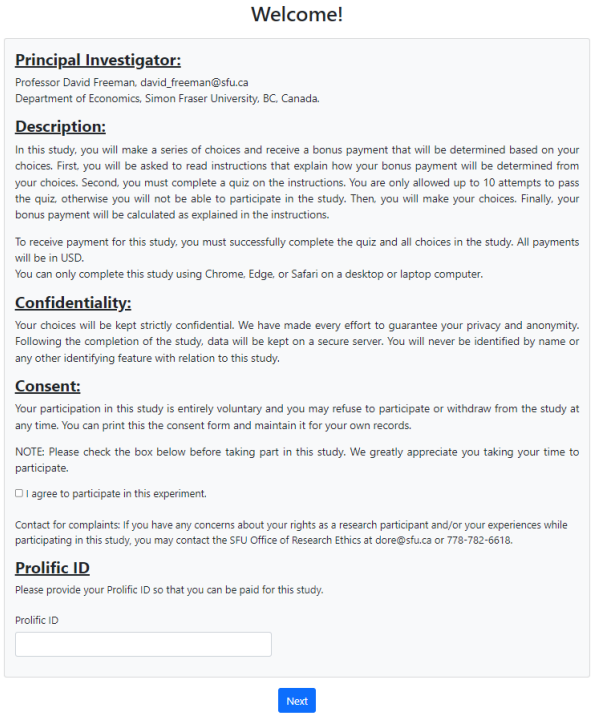


Figure 19. Consent Form

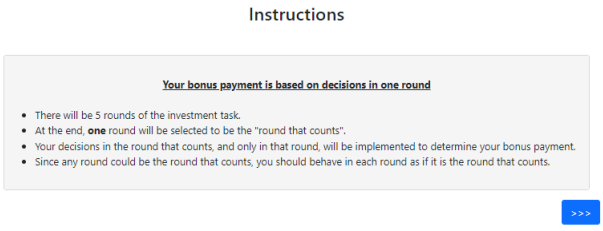


Figure 20. Instructions, Page 1

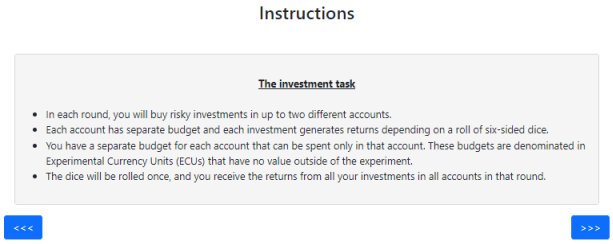


FIGURE 21. Instructions, Page 2

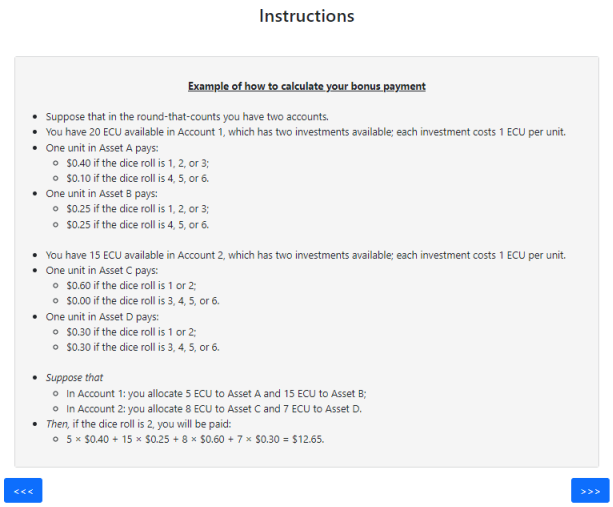


FIGURE 22. Instructions, Page 3

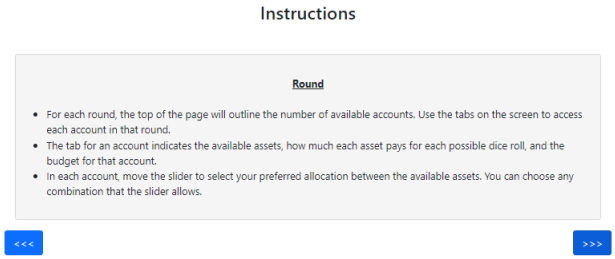


FIGURE 23. Instructions, Page 4, Basic Versions

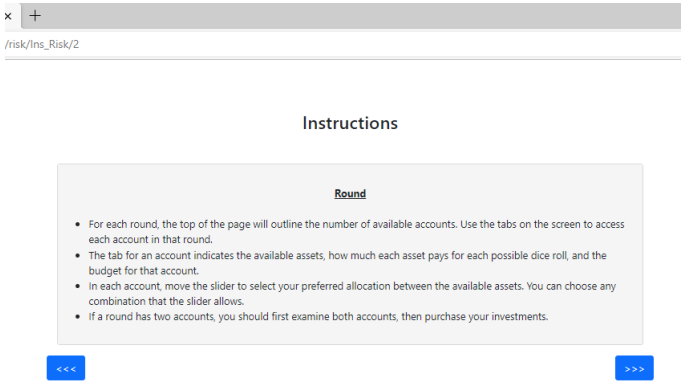


FIGURE 24. Instructions, Page 4, Examine Versions

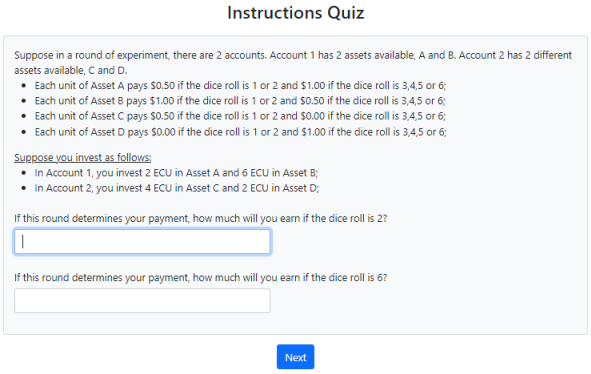


FIGURE 25. Quiz, Page 1, Basic Versions

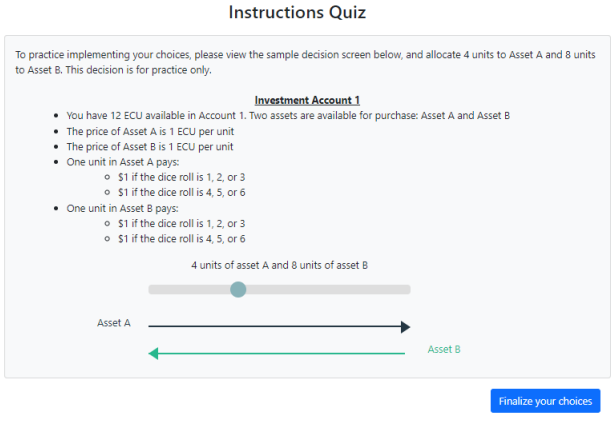


FIGURE 26. Quiz, Page 2, Basic Versions

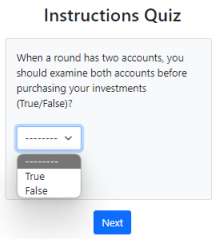


FIGURE 27. Quiz, Additional Question, Examine Versions

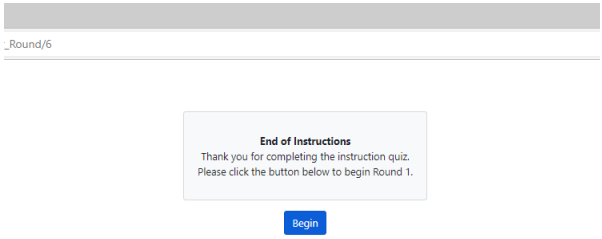


FIGURE 28. Quiz End

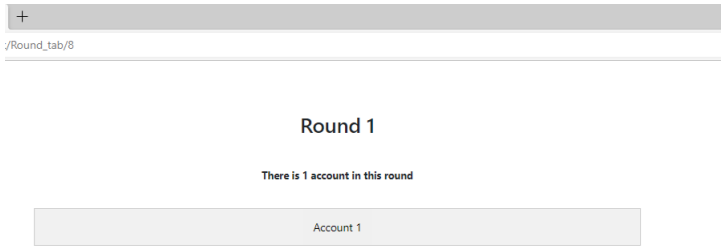


FIGURE 29. Round 1 initial screen, one-part decision randomly selected for Round 1

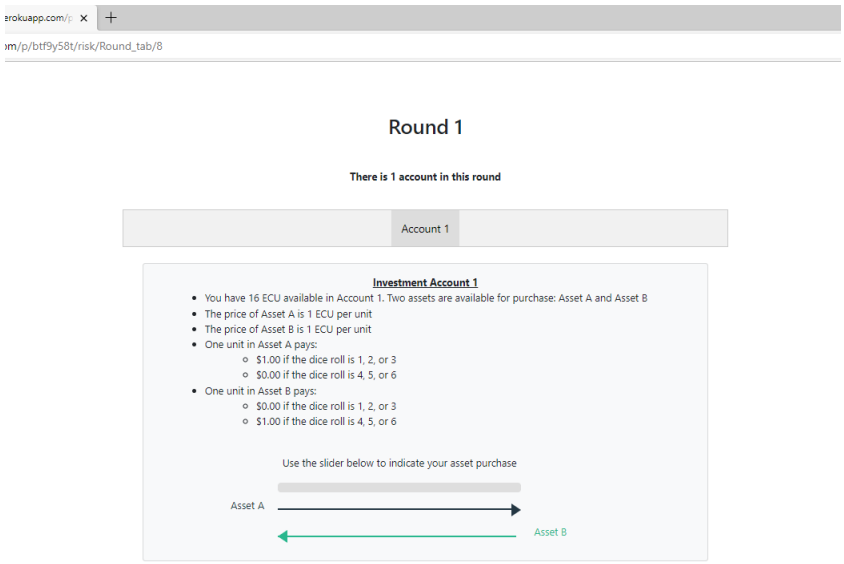


FIGURE 30. Round 1 decision screen, one-part decision randomly selected for Round 1

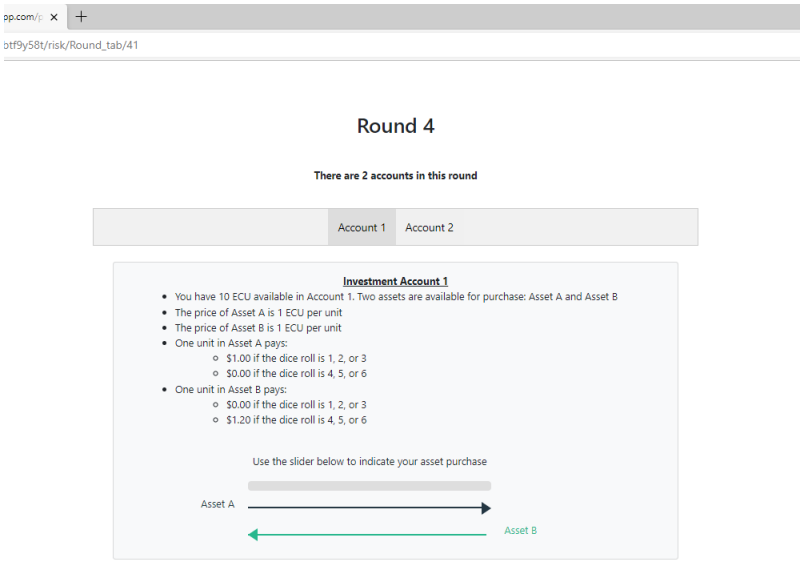


FIGURE 31. Round 4 decision screen, tabs version, two-part decision randomly selected for Round 4

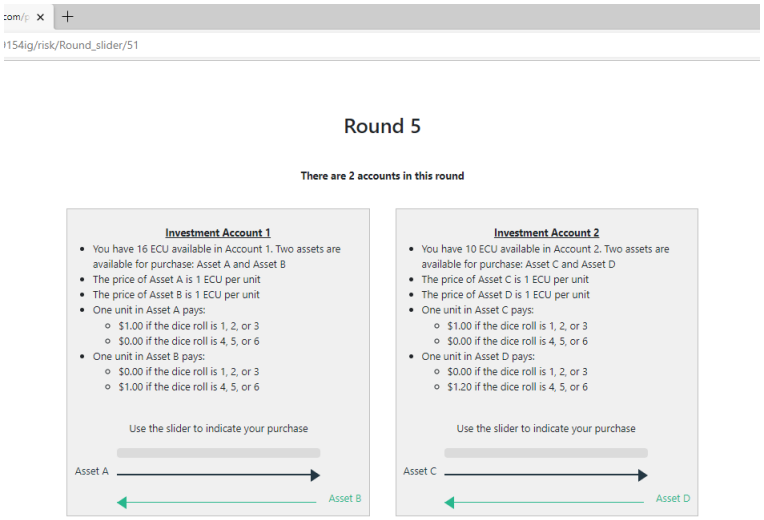


FIGURE 32. Round 5 decision screen, side-by-side version, two-part decision randomly selected for Round 5

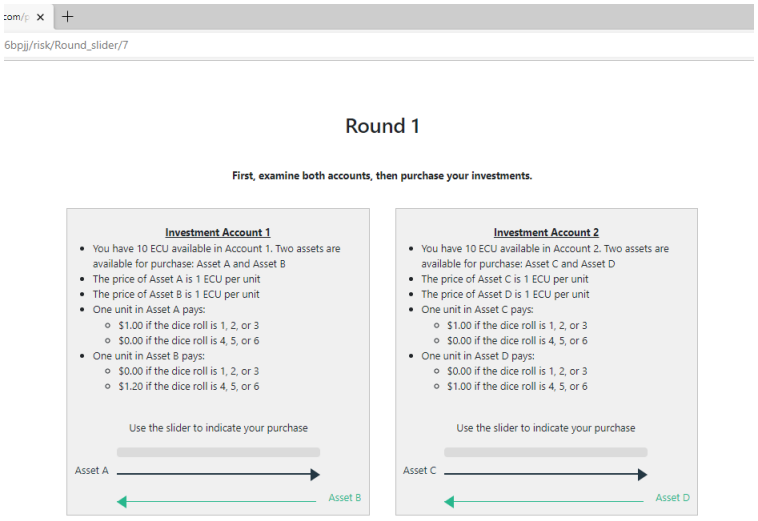


FIGURE 33. Round 1 decision screen, examine + side-by-side version, two-part decision randomly selected for Round 1

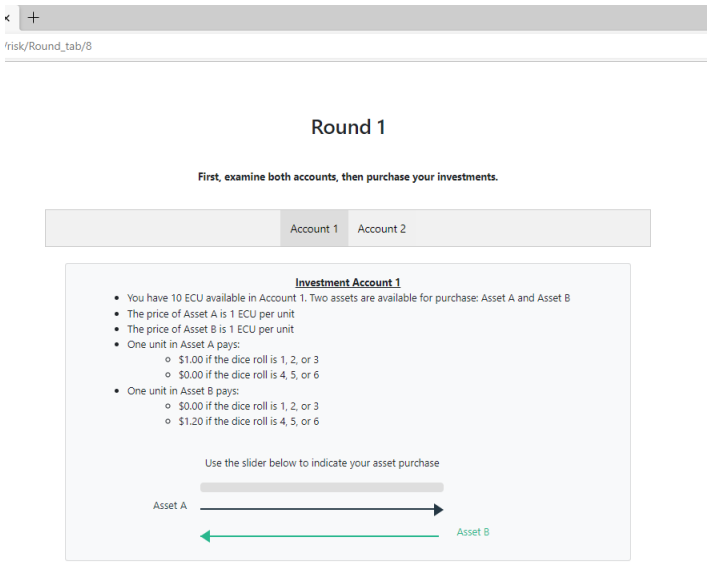


FIGURE 34. Round 1 decision screen, examine + tabs version, two-part decision randomly selected for Round 1

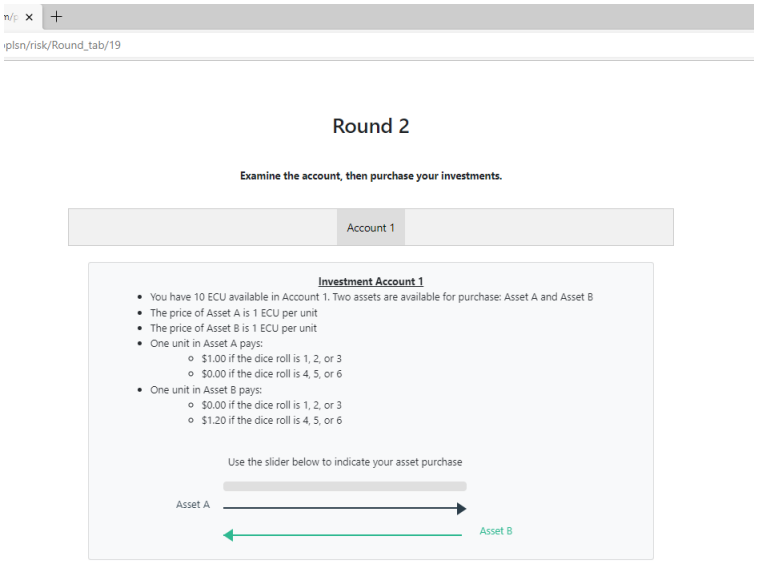


FIGURE 35. Round 2 decision screen, examine + tabs version, one-part decision randomly selected for Round 2

The final survey was the same as in the Online Shopping Experiment, and screenshots of it are provided in the next section.

Appendix L. Online Shopping Experiment Screenshots

The recruitment procedure and consent form were identical to the Online Risk Experiment.

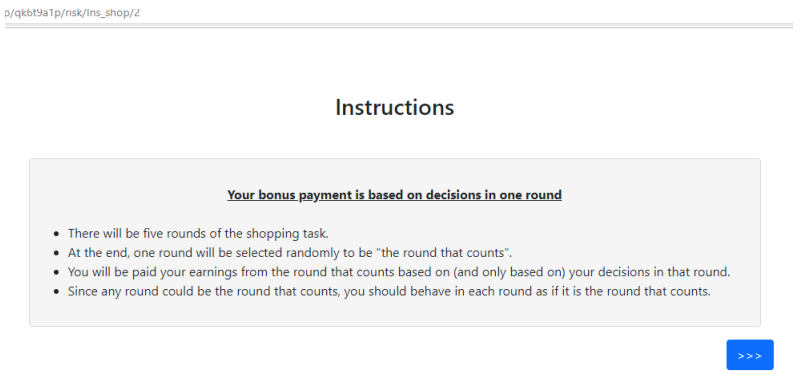


Figure 36. Instructions Page 1

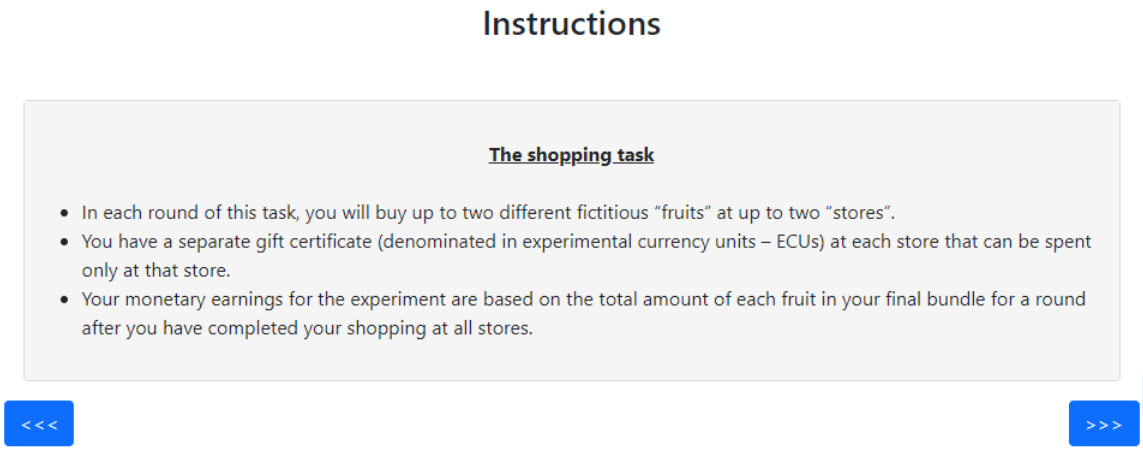


Figure 37. Instructions Page 2

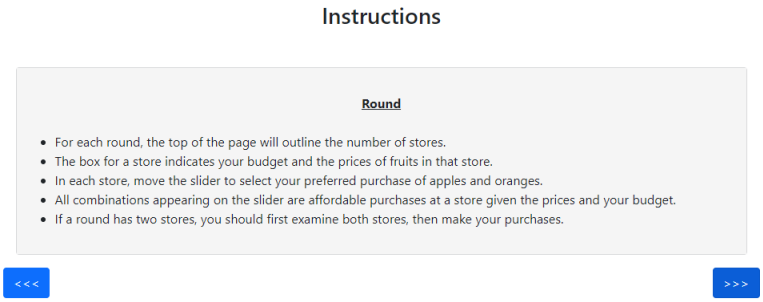


FIGURE 38. Instructions Page 3

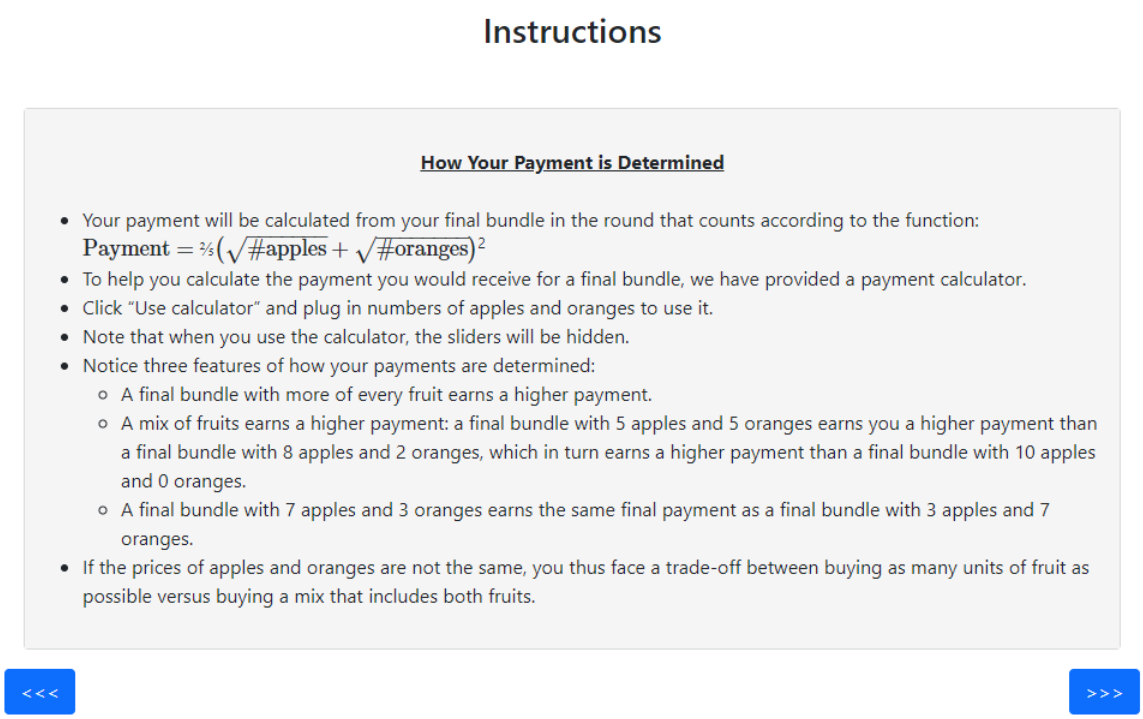


FIGURE 39. Instructions Page 4

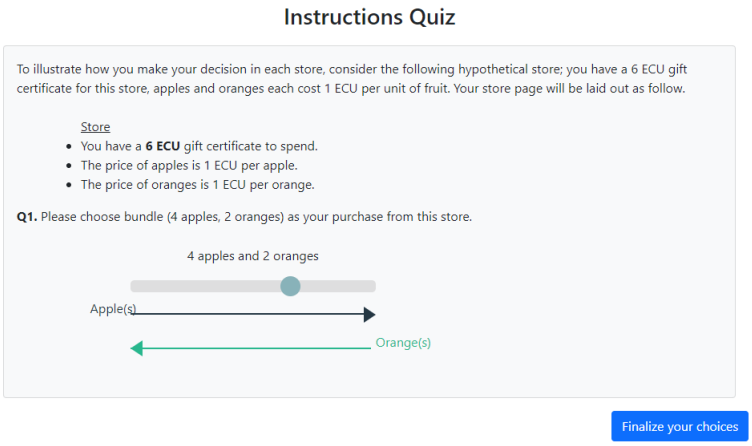


FIGURE 40. Instructions Quiz Q1

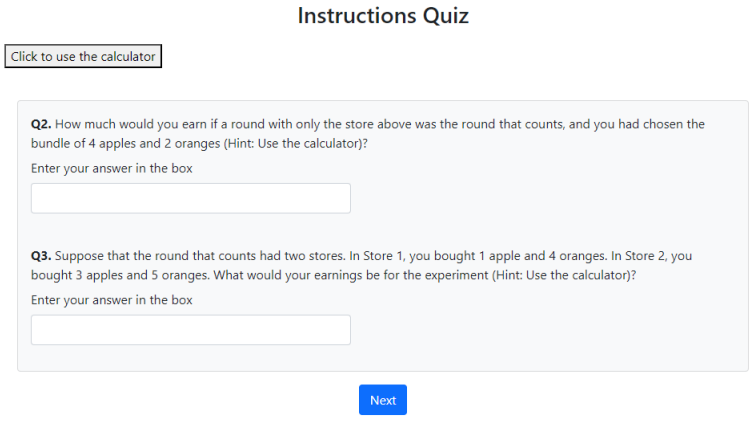


FIGURE 41. Instructions Quiz Q2

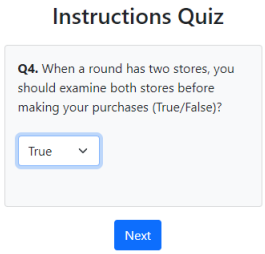


FIGURE 42. Instructions Quiz Q3

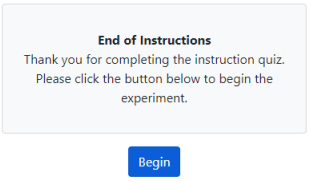


FIGURE 43. End of Instructions

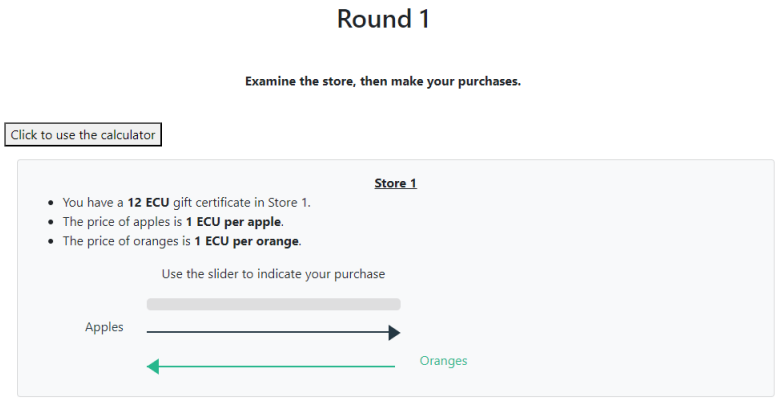


FIGURE 44. Sample Round 1 (randomly determined to be D4 in this case)

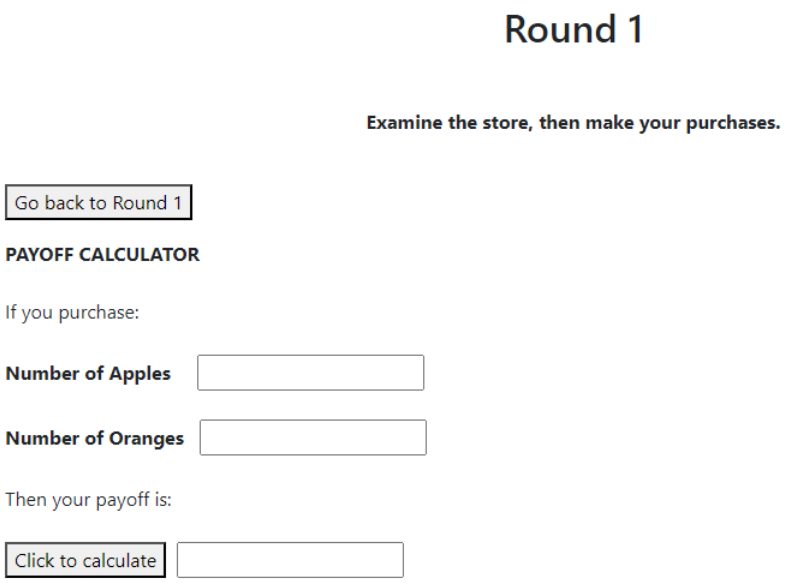


FIGURE 45. Calculator Screen

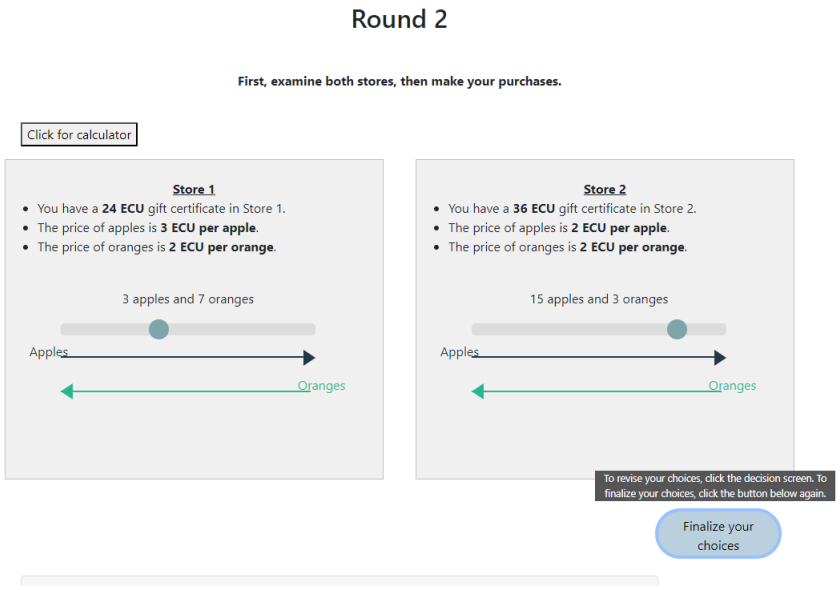


FIGURE 46. Sample Round 2 (randomly determined to be D3 in this case), showing prompt before finalizing choices

In order to simplify the visual interface and the programming task, our Online Shopping Experiment no longer offers a "sale" price in D2. Instead, it offers a budget of 40 ECU and prices of 2 ECU per fruit for both apples and oranges. This is visually shown in Figure 47.

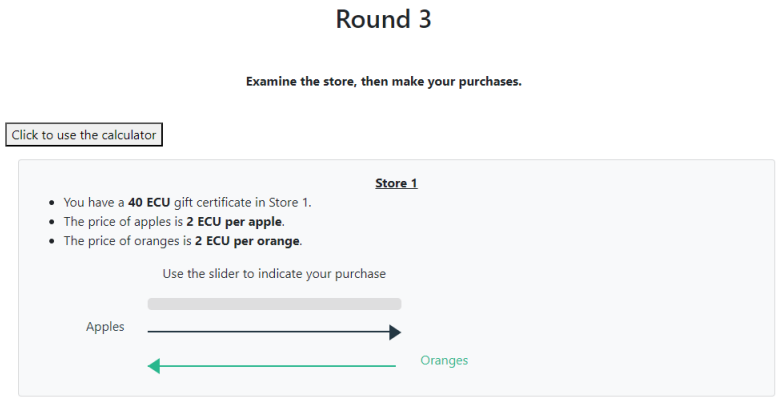


FIGURE 47. Sample Round 3 (randomly determined to be D2 in this case).

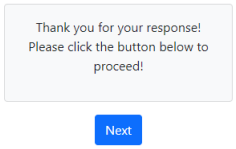


FIGURE 48. After Round Screen, appears after each decision screen in all online experiments

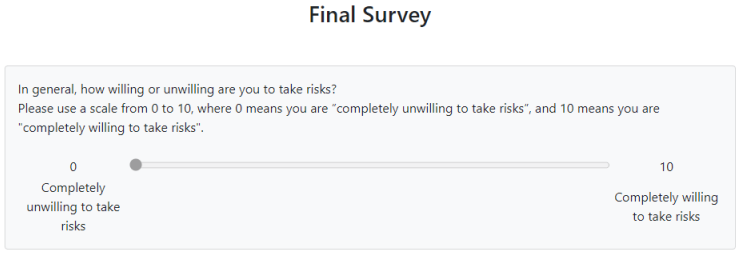


FIGURE 49. Survey Page 1 (self-reported risk aversion)

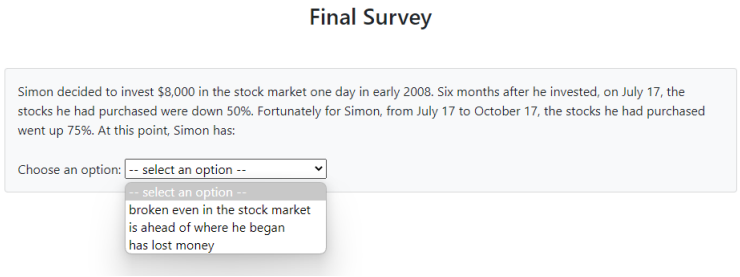


FIGURE 50. Survey Page 2 (CRT)

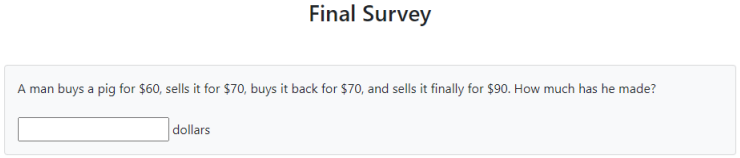


FIGURE 51. Survey Page 3 (CRT)

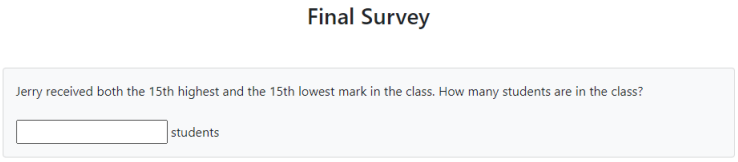


FIGURE 52. Survey Page 4 (CRT)

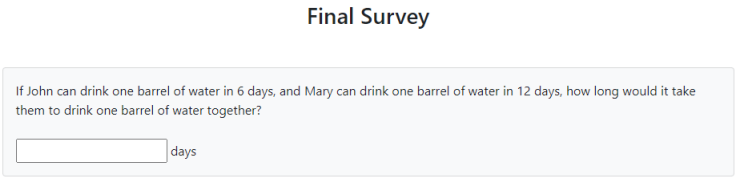


FIGURE 53. Survey Page 5 (CRT)

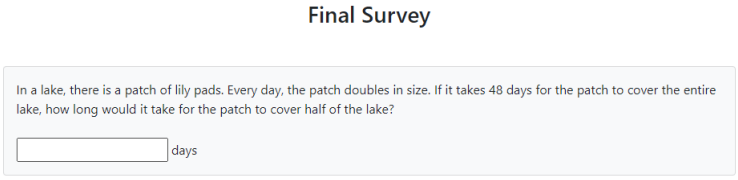


FIGURE 54. Survey Page 6 (CRT)

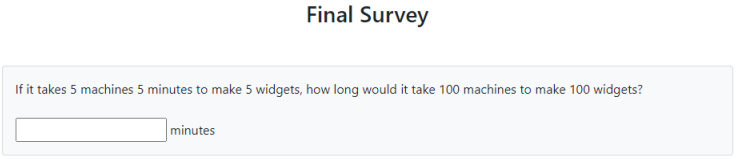


FIGURE 55. Survey Page 7 (CRT)

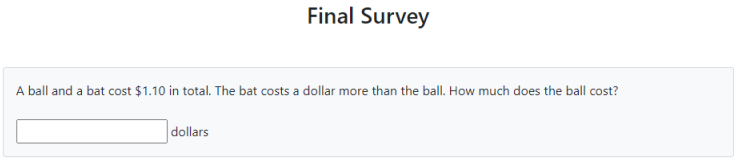


FIGURE 56. Survey Page 8 (CRT)

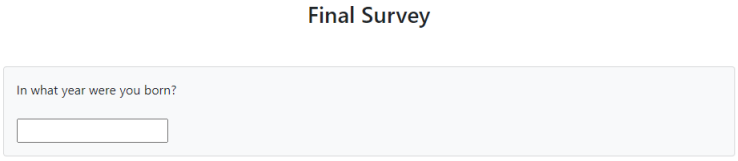


FIGURE 57. Survey Page 9 (age)

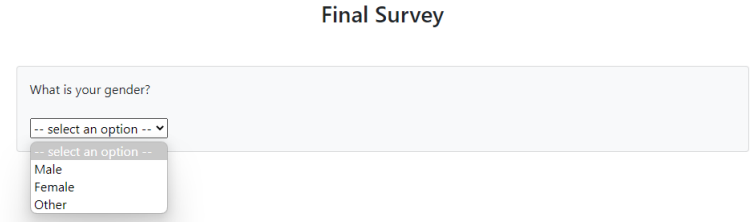


FIGURE 58. Survey Page 10 (gender)

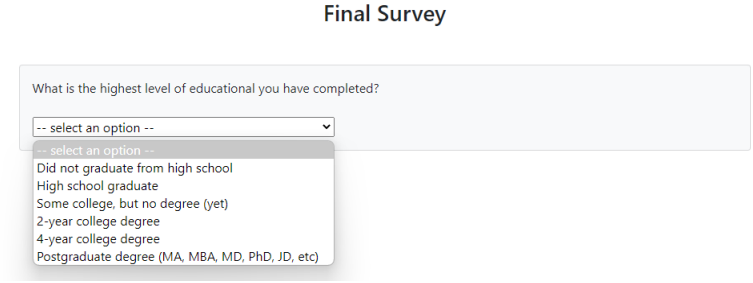


FIGURE 59. Survey Page 11 (education)

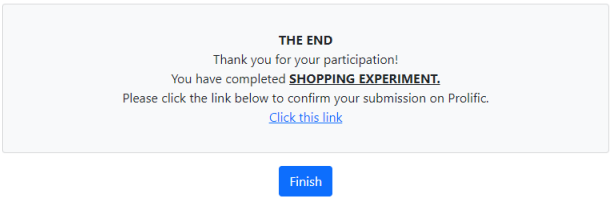


FIGURE 60. End Page