

Econ 3542: Experimental and Behavioral Economics
Exam #2 Review Questions

▪ **CHAPTER 12: Bargaining in the Lab**

- What is the typical result on proposals in the simple ultimatum game? What is the (selfish) theoretical prediction? What could be causing the difference between the two?
 - Proposers offer about 40% of the pie, and it is usually accepted. Rejection rates increase as offers decrease, with basically no rejections ever when 50% of the pie is offered. Some research also shows that a given % offer is even less-likely to be rejected for larger pie-sizes.
 - The (selfish) theoretical prediction is that the smallest possible amount will be offered, which is then accepted by the responder who should prefer even \$.01 rather than zero.
 - The difference between theoretical prediction and actual outcomes could be a concern for fairness, a fear of offers being rejected, or even fear that the experimenter will think the proposer is a jerk if proposing too little.
- What is a “double-blind” method in experiments, and how has this type of method been used in evaluating results from the dictator game experiments?
 - The double-blind method is a way of ensuring that subjects’ decisions are not only anonymous amongst subjects, but also anonymous to the experimenter. So, the experiment has no way of knowing what your decisions were in a double-blind experiment (the experimenter has the decision data, but just can’t link that to any subject by name...ID numbers and coded envelopes are used for the double-blind procedure).
 - In the dictator game, offers were significantly less when using a double-blind treatment, showing that some offers were due to the lack of anonymity of subject decisions with respect to the experimenter (offers were still, however, greater than zero on average).
- Name at least two experimental variables that have been shown to affect outcomes in the dictator or ultimatum games
 - earned rights to be the proposer (tends to decrease offers in ultimatum)
 - posted-offer (retail market) context (tends to decrease offers in ultimatum)
 - double-blind (tends to decrease dictator offers)
 - pessimism (reduces the minimum acceptable offer of ultimatum responders)
- Neuroeconomics has found that when proposers make unfair ultimatum offers, this activates two brain regions in responders. The first is the “deliberative” thinking area (i.e., prefrontal cortex), and the second is which general area? (I’m not looking for a specific technical brain region name).
 - Unfair offers have been shown to activate the “emotion” region of the brain also. More specifically, they cause similar brain activation compared to when someone smells a foul odor!

▪ **CHAPTER 13: Behavioral Labor Economics (trust, reciprocity)**

- Describe the “Trust” game, and highlight the two key behavioral outcomes that can be analyzed from this game
 - In the trust game, the first-mover can choose to keep or pass any portion of a fixed amount of money \$X. Whatever is passed is multiplied by some factor M (e.g., if tripled, then M=3) and the second-mover can choose to keep some or all of that passed (and expanded) amount, or pass some back.
 - Key outcome measure are amount initially passed (to examine one’s “trust”), and the amount returned by the second-mover (to examine one’s “trustworthiness”)
- Describe field experiment applications of the trust game (describe at least two).
 - CEOs are more trusting and trustworthy than college students (discuss some more details of the experiment)
 - outcomes in “trust” experiment have also been successful at predicting future loan payback rates (more detail)
- **CHAPTER 14: Voluntary Contributions**
 - Describe a detailed setup (i.e., parameterization) for a voluntary contributions public goods game, where the Nash equilibrium is to free-ride, but it is efficient to contribute 100% towards provision of the public good.
 - Let w be one’s endowment of tokens, let x be one’s contribution to a group good, and let π be one’s payoff. Suppose each subject starts with a token endowment of 20 tokens, and there are 4 people in the “group”. A token can be either kept in a private account to earn \$.10, whereas a token placed in the group account earns \$.05 for each and every group member. Payoffs can be written as $p = (.10)(w-x) + (.05)(\sum x)$. Here, the private incentive is to free ride (i.e., the MPCR=.05 is less than .10, which is the private incentive to keep a token). If everyone free-rides, total group earnings are \$8 (\$2 per person). If everyone contributes to the group account, total group earnings would be \$16 (\$4 per person). So, the efficient outcome is to contribute everything, but the equilibrium prediction is that everyone free-rides and contributes nothing.
 - Describe two alternative hypotheses about contributions in a public goods game with respect to increasing the group size. That is, discuss one hypothesis regarding why larger groups might contribute less, and another hypothesis that indicates why contributions should rise. (Note: these will necessarily be non-Nash hypotheses, because we are assuming that we preserve the Nash prediction of complete free-riding while we manipulate the group size).
 - One might predict larger groups decrease the percentage that each person contributes, because it is easier to be “anonymous” or think that there are plenty of others to contribute instead.
 - One might predict larger groups increase the percentage that each person contributes, because a token contributed to the group account is multiplied by a larger number of group participants, thus giving you more bang for your contribution buck (the data are more in favor of this result)
 - How might one evaluate efficiency in a public goods experiment?

- simply evaluate total tokens contributed divided by the efficient level of contributions. This measure will go from 0-100.

- **CHAPTER 29: Optimal Search Behavior**

- Suppose that the marginal revenue of a job search is given by:

$$MR=75-w$$

Suppose also that the marginal cost of a job search is given by:

$$MC=15+w$$

where w is the current wage offer the employee faces.

- a) What is this worker's reservation wage?

- The worker optimally calculates the reservation wage by setting $MR=MC$, so that $75-w=15+w$. This yields $w_r^*=\$30$.

- b) Assume that the worker has skill level $k^*=50$, and that whatever a worker's skill level is, the wages employers offer as a function of the skills they require are $w(k)=k$. So, with skill level k^* the worker is considered qualified for jobs requiring $k \leq k^*$. Assume also that the worker has imperfect information jobs in the labor market, but the worker knows that the distribution of potential jobs is such that there is an equal chance of finding a job offering wage \$21-\$120 (e.g., a 1% chance of finding a job offering \$21, a 1% chance of finding a job offering \$22, all the way up to a 1% change of finding a job offering \$120).

What is the chance that this worker will find an acceptable job offer for which he/she is qualified? (*note: your answer will require information from part (a)*).

- The worker will accept any offer greater than $w_r^*=\$30$, and is qualified only for jobs paying wages less than or equal to \$50. This is a range of wages of \$20, and given the probability of wage description above, there is a 20% chance of the worker being offered a wage in this range.

- c) What is the expected wage from this worker's job search?

- The expected wage from search is just the mid-point of the acceptable (and qualified to get) wage range (i.e., mid-point of the \$30-\$50 wage range), given that each wage within this range is equally likely. So, the expected wage from search is $w=\$40$.

- d) Suppose that unemployment insurance benefits just got worse, such that the worker's marginal cost of search is now $MC=25+w$ (i.e., the "out-of-pocket" search costs increase from 15 to 25). What does this do to the worker's reservation wage, the expected duration of job search (i.e., the probability of finding an acceptable job offer), and the expected wage from the job search?

- Recalculation shows that now $w_r^*=25$ (optimal reservation wage falls), search duration will fall (because more offers are now acceptable), and the expected wage from search falls to \$37.50.

- The previous question helps you understand the context behind setting up an optimal search experiment. How might the assumption of risk aversion affect

predictions in an optimal search experiment, and what have been the general results of optimal search experiments?

- The optimal reservation wage is calculated assuming risk-neutrality. A risk averse person would have a lower reservation wage than a risk neutral person.
- Results are generally consistent with optimal search predictions, with some deviations in the direction predicted by risk aversion.

▪ **CHAPTER 30: Information updating and Bayes Rule (sleep dep discussion also)**

- Suppose there are two cups, a red and a blue cup. Both cups contain 5 balls, but the red cup has 4 red and 1 blue ball, while the blue cup has 4 blue and 1 red ball. Use Bayes rule to calculate the posterior probability that the red cup is used if the prior (base rate) odds of using the red cup was 1/4, and we draw one red ball as the evidence (i.e., not knowing exactly which cup was used, only knowing the prior odds). How does your answer differ if 2 red balls are drawn (with replacement)? What about if 2 blue balls are drawn?

- If the evidence is one red ball, then the Bayes rule posterior odds of it being the red cup that was used are

$$P(\text{redcup} | \text{evidence}) = \frac{P_{\text{redcup}} \cdot P(\text{evidence} | \text{redcup})}{P_{\text{redcup}} \cdot P(\text{evidence} | \text{redcup}) + P_{\text{bluecup}} \cdot P(\text{evidence} | \text{bluecup})}$$

which is $\frac{(\frac{1}{4}) \cdot (\frac{4}{5})}{(\frac{1}{4}) \cdot (\frac{4}{5}) + (\frac{3}{4}) \cdot (\frac{1}{5})} = \frac{.2}{.35} = .57$. So, given the new evidence,

the Bayesian person now considers it *more* likely that the red cup is being used, because of the new information, even though the base rate was much more in favor of the blue cup being used.

- If 2 red balls were drawn as evidence, the Bayes rule posterior odds are:

$$\frac{(\frac{1}{4}) \cdot (\frac{4}{5} \cdot \frac{4}{5})}{(\frac{1}{4}) \cdot (\frac{4}{5} \cdot \frac{4}{5}) + (\frac{3}{4}) \cdot (\frac{1}{5} \cdot \frac{1}{5})} = \frac{.16}{.19} = .84 \text{ (or, 84\% chance it is the red cup)}$$

- If 2 blue balls were drawn as evidence, then we have

$$\frac{(\frac{1}{4}) \cdot (\frac{1}{5} \cdot \frac{1}{5})}{(\frac{1}{4}) \cdot (\frac{1}{5} \cdot \frac{1}{5}) + (\frac{3}{4}) \cdot (\frac{4}{5} \cdot \frac{4}{5})} = \frac{.01}{.49} = .02 \text{ (or, a 2\% chance it is the red cup)}$$

- Describe two alternative Bayes rule experiments, where the outcome measures differ. Talk about the benefits and drawback of each approach.
 - Two approaches are dichotomous choice or elicited probabilities
 - For dichotomous choice, the benefit is that it is simple to understand, but the drawback is that the data do not show strength of preference.
 - For the probability elicitation, the drawback is that the elicitation procedure is somewhat complicated, but the benefit is that it supposedly generates a measure of actual subjective probability belief.

- What does emerging research show about the effects of total sleep deprivation on Bayes rule outcomes and risky choice?
 - TSD did not alter accuracy of choice in a (dichotomous choice) Bayes rule experiment, although it did significantly decrease the weight placed on new information. That is, is altered the subjects' decision model.
 - TSD was shown to decrease one's sensitivity to risk. For gambles involving gains, risk averse subjects became less risk averse. When the gambles were for losses, subjects were risk-loving, on average, and following TSD they became less risk-loving.

- **CHAPTER 32: Statistical Discrimination**
 - Describe the key difference between statistical discrimination and other models of discrimination? Give examples of each.
 - Statistical discrimination is not prejudice-based. A prejudice-based model would say, for example, that 18-year old male drivers are charged higher auto insurance rates because insurance companies personally dislike these drivers. A statistical discrimination model would say that young male drivers are charged higher auto insurance rates because they belong to a group of drivers that have a higher statistical likelihood of accident.
 - Give examples of two different types of experiments that have been used to study statistical discrimination, and highlight their key results
 - Davis (1987) studied maximal quality selection, and found that when drawing more samples from one group, the employer inferred higher quality of that group (based on the "highest" draw getting higher when drawing more often from that favored distribution).
 - Dickinson and Oaxaca (2006) found that statistical discrimination can be based on characteristics of a productivity distribution (for workers) other than the mean of the distribution. Workers from "riskier" groups, with identical mean productivity levels, were paid less on average.
 - Gneezy and List (see chapter 32) use a field experiment of disabled drivers and auto repair quotes (a statistical discrimination story fits their data best)