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First Name:

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Requirements: You have 90 minutes. The last two pages are marked scrap: you must detach them. There are no aids allowed. Please keep these papers closed on your desk until the start of the test is announced. Only test pages 6 – 8 and not scrap pages will be marked. Write your final answer on pages 6 and 7 (using page 8 if absolutely necessary). No additional paper is provided beyond page 8: your answer must fit. Write legibly.

Background: These sources – announced ahead of time – prepare you for this test: (1) Lectures 14, 15 & 17, HW 17 (“Hypothesis Testing: Significance, Rejection Regions, p_1 vs. p_2 ”, “Hypothesis Testing: Type I and II Errors & Power,” & “Inference about the difference between u_1 & u_2 using \bar{X}_1 & \bar{X}_2 ”), (2) Sections 12.8 – 12.10 & Chapter 14 of our textbook (“Comparing Two Proportions,” “Two Types of Error,” “Power,” & “Comparing Two Means”), (3) Tutorial sessions on February 14, 2014 with Prof. Murdock including the handouts and slides, (4) Question 2 on Term Test #2, January 31, 2014 (“Does Price Matter in Charitable Giving? Evidence from a Large-Scale Natural Field Experiment”), (5) TK71 and HW TK71 (Tversky, Amos and Daniel Kahneman (1971) “Belief in the Law of Small Numbers,” *Psychological Bulletin*, 76(2), pp. 105 – 110), (6) Andreoni, James and Lise Vesterlund (2001) “Which is the Fair Sex? Gender Differences in Altruism” *The Quarterly Journal of Economics*, 116(1), pp. 293 – 312.

Structure: This test gives quantitative results that you must interpret. A single main question is followed by supporting questions that help guide you towards a full answer to the main question.

Guide to answering effectively:

- Directly and fully address the question. **[Required to earn points]**
 - To give a complete answer to the main question, address the supporting questions.
- To answer the questions, *apply* relevant course concepts to the quantitative results given. **[45 points]**
 - Critically evaluate the results.
- Write your answer using complete sentences and well-organized paragraphs. **[5 points]**
 - Use complete sentences throughout.
 - Answer with multiple well-structured paragraphs that coherently answer the main question.
 - Your response is expected to be about 1 ½ pages long (handwritten).
 - Spend about 45 minutes considering/outlining your arguments and about 45 minutes writing.
 - Use the scrap pages for a first draft/outline.

Student #:

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	Analysis	Writing	Raw Score	Your Mark (out of 100%)
<i>Point Value:</i>	45	5	50	
Points Earned:				

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On February 14, 2014 students in ECO220Y participated in an exercise like the original participants from Andreoni and Vesterlund's "Which is the Fair Sex: Gender Differences in Altruism" published in 2001 and hereafter abbreviated as A&V (2001). Specifically, each participant divided tokens between her/himself and another randomly selected participant in the room (whose identity would never be revealed). Each person made eight allocation decisions – budgets 1 through 8 shown below¹ – where the number of tokens and the point values to each person (self and other) varied. Each point is worth \$0.10 to all participants in all cases.

1. Divide 40 tokens: *Hold* _____ @ 1 point each, and *Pass* _____ @ 3 points each.
2. Divide 60 tokens: *Hold* _____ @ 1 point each, and *Pass* _____ @ 2 points each.
3. Divide 75 tokens: *Hold* _____ @ 1 point each, and *Pass* _____ @ 2 points each.
4. Divide 60 tokens: *Hold* _____ @ 1 point each, and *Pass* _____ @ 1 point each.
5. Divide 100 tokens: *Hold* _____ @ 1 point each, and *Pass* _____ @ 1 point each.
6. Divide 60 tokens: *Hold* _____ @ 2 points each, and *Pass* _____ @ 1 point each.
7. Divide 75 tokens: *Hold* _____ @ 2 points each, and *Pass* _____ @ 1 point each.
8. Divide 40 tokens: *Hold* _____ @ 3 points each, and *Pass* _____ @ 1 point each.

ECO220Y (2014) attempted to replicate the original study. One difference is that rather than pay everyone for one randomly selected allocation as A&V (2001) did using a research grant, ECO220Y (2014) paid randomly selected participants using money students donated and \$60.00 donated by Prof. Murdock.²

A&V (2001) had data from four sessions. These included 70 volunteers from intermediate and upper-level economics courses at the University of Wisconsin in 1995 and 72 volunteers at Iowa State University in 1997 for a total sample of 142 (95 males and 47 females). ECO220Y (2014) used data from three sessions on February 14, 2014 during ECO220Y tutorials with Prof. Murdock: 200 participated (75 males and 125 females).

Next are the abstract from A&V (2001), quotes from TK71, and three tables of results for the A&V (2001) and ECO220Y (2014) data. The first two tables are in a format like "Table II" in A&V (2001).

Abstract from A&V (2001): We study gender differences in altruism by examining a modified dictator game with varying incomes and prices. Our results indicate that the question "which is the fair sex?" has a complicated answer—when altruism is expensive, women are kinder, but when it is cheap, men are more altruistic. That is, we find that the male and female "demand curves for altruism" cross, and that men are more responsive to price changes. Furthermore, men are more likely to be either perfectly selfish or perfectly selfless, whereas women tend to be "equalitarians" who prefer to share evenly.

Quotes from TK71: "[Researchers] have an exaggerated belief in the likelihood of successfully replicating an obtained finding." (p. 105) "Altogether our respondents evaluated the replication rather harshly. This follows from the representation hypothesis: if we expect all samples to be very similar to one another, then almost all replications of a valid hypothesis should be statistically significant." (p. 108) "Unrealistic expectations concerning the replicability of significance levels may be corrected if the distinction between size and significance is clarified, and if the computed size of observed effects is routinely reported." (p. 110)

¹ Both A&V (2001) and ECO220Y (2014) randomized the order the eight allocation choices appeared to each participant.

² Nearly all students voluntarily donated \$2.00 to a collection jar as suggested by Prof. Murdock in the lectures leading up to the tutorials. A few gave other loose change or declined to give. All ECO220Y students were welcome to participate regardless of donating and were told so ahead of time. At the time of the donation, students knew only that it would fund an exercise that we would do and that they would not get the money back but did have some chance of making money.

Table 1: Mean Payoff to Other Party from A&V (2001)

Budget	Token endowment	Income m	p_o/p_s	All subjects (n=142)	Males (n=95)	Females (n=47)	t -stat
1	40	4.00	1/3	3.79	4.18	3.01	1.96
2	60	6.00	1/2	4.03	4.30	3.49	1.48
3	75	7.50	1/2	4.68	5.00	4.03	1.53
4	60	6.00	1	1.54	1.36	1.91	-2.26
5	100	10.00	1	2.52	2.33	2.92	-1.42
6	60	12.00	2	1.42	1.21	1.82	-2.07
7	75	15.00	2	1.71	1.42	2.29	-2.35
8	40	12.00	3	0.89	0.67	1.32	-2.97
Average				2.57	2.56	2.60	-0.24

Table 2: Mean Payoff to Other Party from ECO220Y (2014)

Budget	Token endowment	Income m	p_o/p_s	All subjects (n=200)	Males (n=75)	Females (n=125)	t -stat
1	40	4.00	1/3	4.78	4.69	4.83	-0.24
2	60	6.00	1/2	4.80	4.68	4.88	-0.37
3	75	7.50	1/2	6.11	5.71	6.35	-1.02
4	60	6.00	1	2.27	1.80	2.56	-3.84
5	100	10.00	1	3.57	2.61	4.14	-4.69
6	60	12.00	2	2.14	1.54	2.50	-4.12
7	75	15.00	2	2.65	2.00	3.05	-3.53
8	40	12.00	3	1.36	1.01	1.58	-3.19
Average				3.46	3.01	3.74	-4.42

Table 3: Mean Payoff to Other Party: Comparing A&V (2001) with ECO220Y (2014)

Budget	Males				Females			
	A&V Mean (s.d.)	ECO220Y Mean (s.d.)	Difference (s.e.)	P-value (2-tailed)	A&V Mean (s.d.)	ECO220Y Mean (s.d.)	Difference (s.e.)	P-value (2-tailed)
1	4.18 (4.22)	4.69 (4.22)	-0.51 (0.65)	0.438	3.01 (2.83)	4.83 (3.62)	-1.82 (0.52)	< 0.001
2	4.30 (3.77)	4.68 (3.91)	-0.38 (0.59)	0.520	3.49 (2.63)	4.88 (3.13)	-1.39 (0.47)	0.004
3	5.00 (4.67)	5.71 (4.54)	-0.72 (0.71)	0.313	4.03 (2.77)	6.35 (3.69)	-2.31 (0.52)	< 0.001
4	1.36 (1.48)	1.80 (1.51)	-0.44 (0.23)	0.059	1.91 (1.31)	2.56 (1.03)	-0.65 (0.21)	0.003
5	2.33 (2.51)	2.61 (2.42)	-0.29 (0.38)	0.450	2.92 (2.27)	4.14 (1.85)	-1.22 (0.37)	0.002
6	1.21 (1.57)	1.54 (1.64)	-0.33 (0.25)	0.189	1.82 (1.68)	2.50 (1.53)	-0.68 (0.28)	0.018
7	1.42 (1.96)	2.00 (2.14)	-0.57 (0.32)	0.075	2.29 (2.12)	3.05 (1.84)	-0.76 (0.35)	0.034
8	0.67 (1.11)	1.01 (1.23)	-0.33 (0.18)	0.070	1.32 (1.27)	1.58 (1.21)	-0.26 (0.21)	0.233

Your audience: Presume that your readers have also just read the previous two pages. However, they need your help to understand what the numbers in the tables mean and what conclusions should be drawn. Last year they took a course like ours but struggled with it. Strive to write a suggested solution that explains the results and conclusions. Use a professional tone like a suggested solution.

Main question: How do the results from ECO220Y (2014) compare with those from A&V (2001)?

Supporting questions: (These help guide you towards a full answer to the main question.)

- Discussion of Tables 1 and 2 (one or two paragraphs recommended):
 - What does Table 1 show regarding economically significant and/or statistically significant differences between males and females? (Remember to provide the context and units.)
 - What does Table 2 show regarding economically significant and/or statistically significant differences between males and females? (Remember to provide the context and units.)
 - How do the results in Tables 1 and 2 compare? Include any differences and any similarities.
- Discussion of Table 3 (one or two paragraphs recommended):
 - What is the point of Table 3? In other words, what can we learn from Table 3 that we could not deduce simply from studying Tables 1 and 2?
 - What test do the P-values refer to? (Be specific and give context.) Interpret the P-value results.
 - Using Table 3, how do the results for males and females compare across the two studies? Are there significant differences? Similarities?
- Critical interpretation of results (one or two paragraphs recommended):
 - Overall, how similar are the results from A&V (2001) and ECO220Y (2014)? What are the most plausible explanations for any notable differences between the A&V and ECO220Y results?
 - Does the main difference in the experimental design – having a grant pay all participants versus having donations pay a random selection of participants – affect the results? If so, how? Explain and bolster your arguments by referencing results from Table 3.
 - Should we conclude that ECO220 (2014) failed to replicate the original findings in A&V (2001)? Make specific references to the quotes from TK71 (given on page 3 of this test).

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 - Your response is expected to be about 1 ½ pages long (handwritten).
 - Spend about 45 minutes considering/outlining your arguments and about 45 minutes writing.
 - Use the scrap pages for a first draft/outline.

Write your final answer on these pages to be graded. Use scrap pages for a draft/outline that is not graded.

