

DO SEX RATIO CHANGES IMPACT EXPERIMENTAL ECONOMIC DECISION MAKING BY MALES?

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ABSTRACT

Economics' understanding of how changes in the sex ratio impact (male) decision making is limited. To date, research has focused on key sex differences in behaviour, without exploring or understanding how changes in the sex of those around us impacts behaviours like risk, altruism and cooperation.

This thesis uses a unique experimental economics laboratory design to explore how changes in the sex ratio impact male decisions and behaviour. By changing the sex of the experimenter present in the laboratory, the study is able to explore how key changes in all male or mixed sex populations are impacted when the sex ratio is artificially manipulated. Key findings of this study show that sex differences are present in some of the games participants played, particularly when males only were compared across varying sex ratio environments.

We also find that the sex of the experimenter may subconsciously influence male's altruistic tendencies in a positive direction. As understanding symmetrical and sex differentiated interactions is critical to key specialisation of economic research (namely, labour economics, education, household behaviour, applied microeconomics more widely) further research is warranted in to how changes in the sex ratio impact male decision making and behaviour, both in the lab and the field.

METHOD

To explore the effects of sex ratios on male behaviour, a laboratory experiment was conducted. The main reason for utilising a laboratory setting for this study was to generate the desired behavioural attributes, notably altruism, cooperation, risk-preferences and reciprocity, with significant control across different sex ratio environments. We could also elicit whether the sex of the research assistants (RA's) influenced male decision making, particularly in all male environments. Table 1 below illustrates the multiple one-shot economic games that were played by participants whilst Table 2 breaks down the various treatment groups of the study.

Table 1: Economic games

Implemented Games	Behavioural Attributes
Bomb Risk Elicitation Task (BRET)	Risk preferences
Public Goods Game	Cooperative altruism
Dictator Game	Pure altruism
Trust/Investment Game	Reciprocal altruism

Table 2: Treatment Groups

Treatment	Description	Observations	Sex Ratio*
FF	Female-biased sample with female research assistants	40	0.7619
FM	Female-biased sample with male research assistants	33	0.8286
MF	Male only sample with female research assistants	43	0
MM	Male only sample with male research assistants	35	0

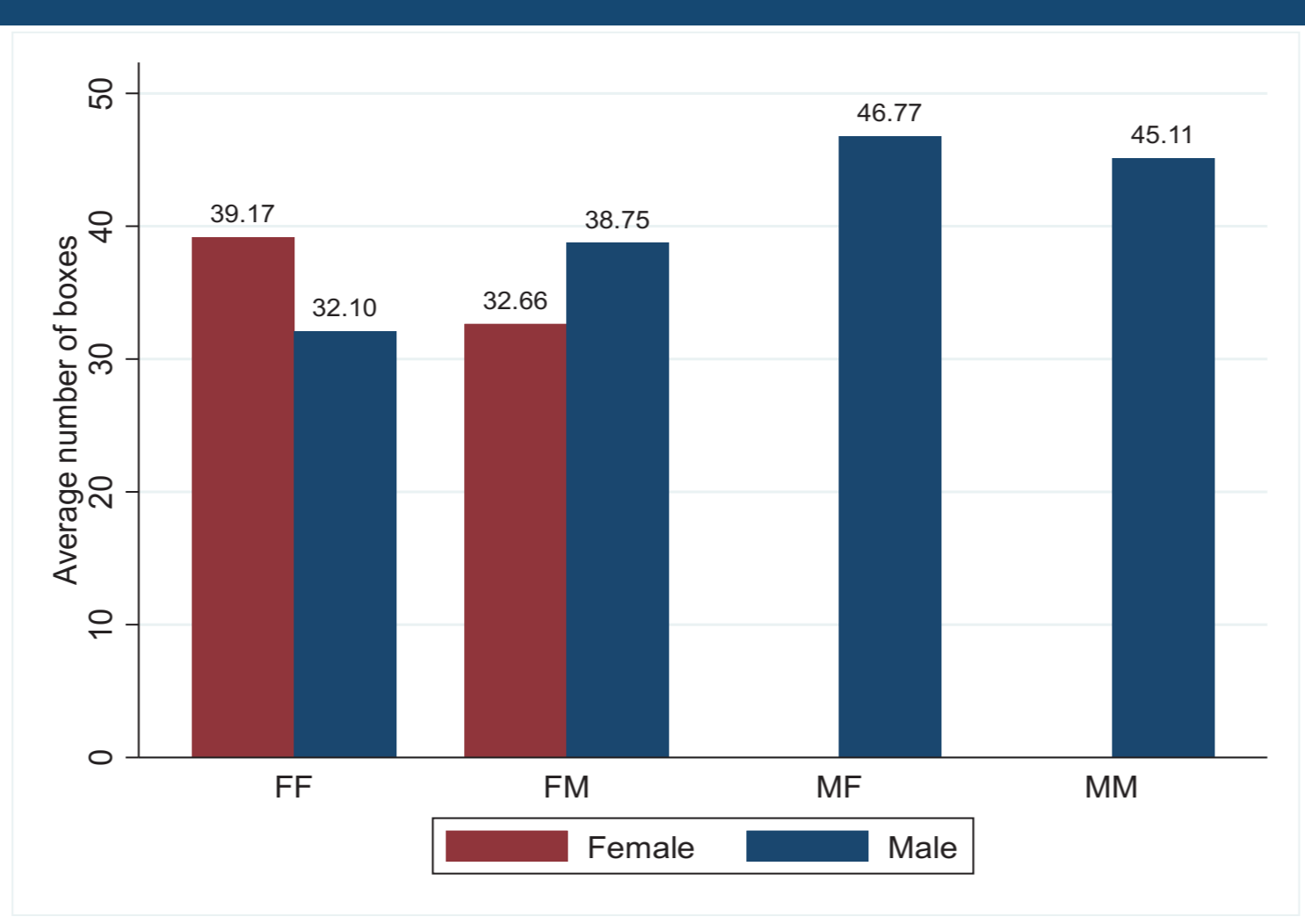
*Sex ratio is females/males, excluding experimenters

RESULTS

BRET

- Significant sex differences in risk attitude between females and males in the male only treatments ($z = 3.710$, $\text{Prob} > |z| = 0.0002$).
- Males in the FF and FM treatments displayed reduced risk on average than those in the male only treatments, though it is statistically insignificant (likely due to the small sample of males in the female-biased treatments)
- The presence of the female experimenters in the male only treatments (MF) slightly raises average risk, however the difference is statistically insignificant ($z = 0.349$, $\text{Prob} > |z| = 0.7273$).

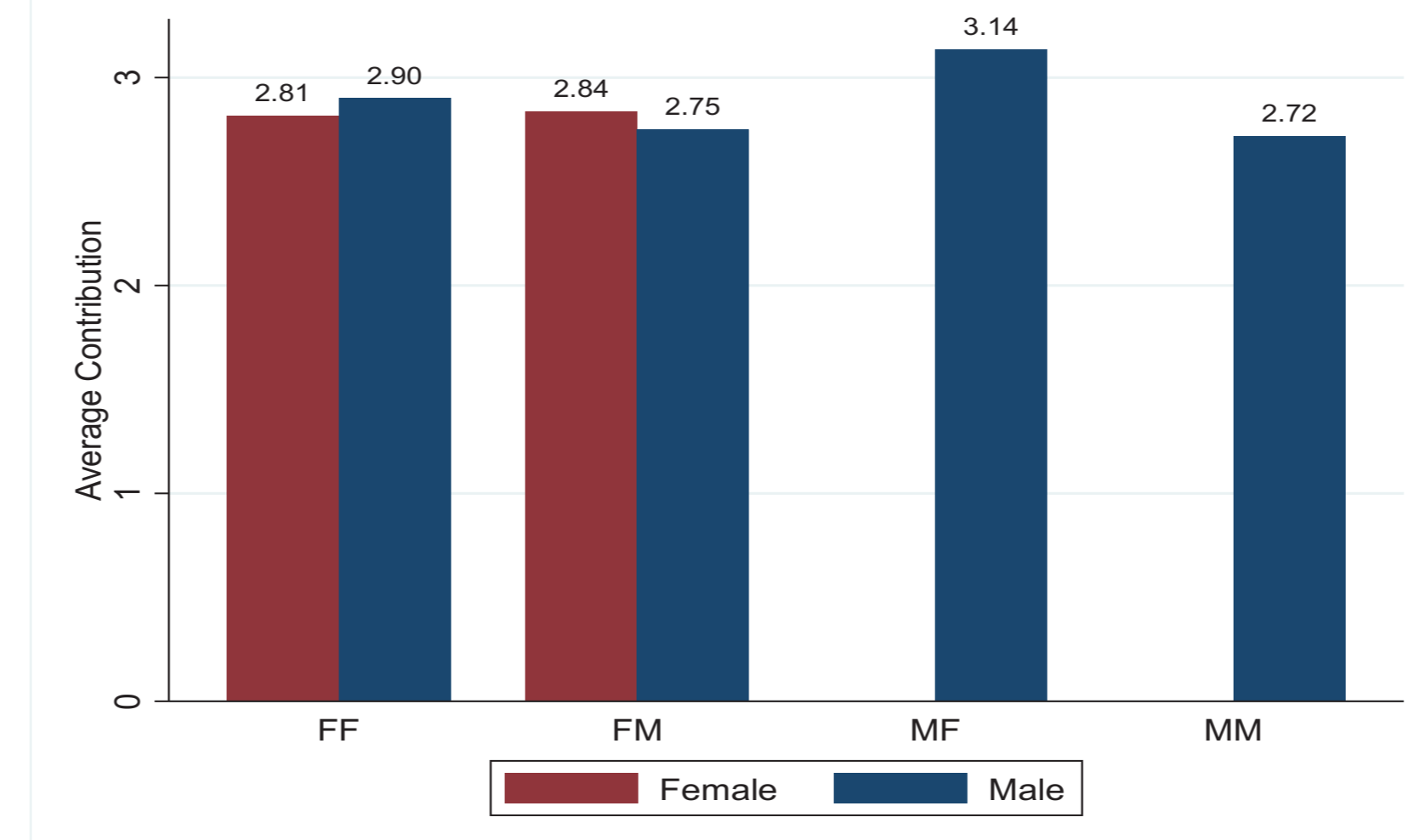
Figure 1: Average boxes over treatments and sex



Public Goods Game

- Looking at Figure 2, we can see that there is essentially no difference between the two female-biased treatments ($z = 0.022$, $\text{Prob} > |z| = 0.9822$), even when it is broken up by sex.
- For the two male-only treatments, contributions were higher on average when exposed to the female researcher, however this difference is also insignificant ($z = 0.999$, $\text{Prob} > |z| = 0.3179$).

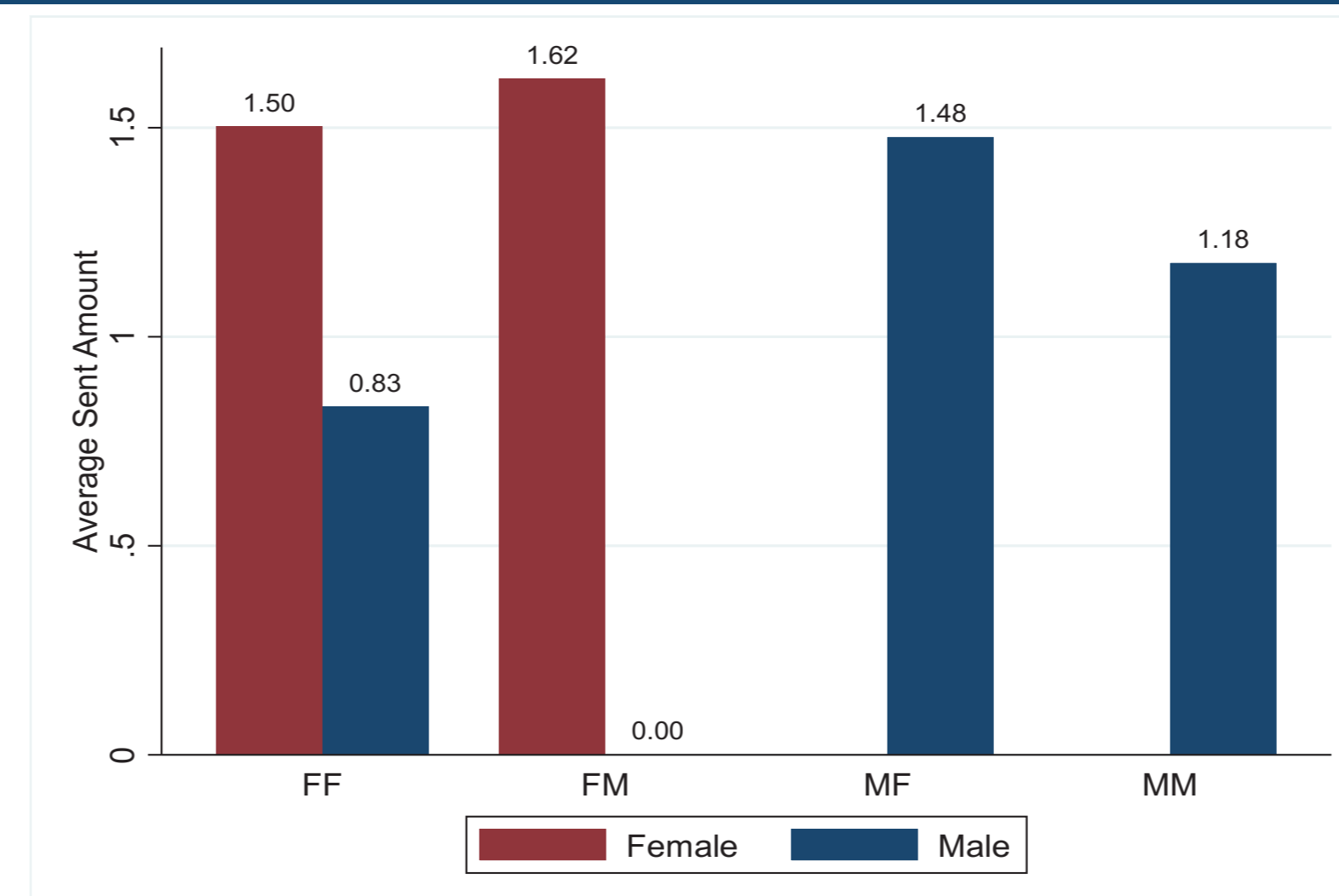
Figure 2: Average contributions over treatments



Dictator Game

- Breaking up the average sent amounts (Figure 4.4) when comparing the two male-only treatments, we can see that much like in the public goods game, males appear to be more altruistic when exposed to the female research assistants, however, this difference is insignificant after performing a Wilcoxon Mann-Whitney test ($z = 0.75$, $\text{Prob} > |z| = 0.4435$).
- If we compare the overall female average sent amount to male average sent amount in the MM treatment only, there does appear to be a sex difference. A Wilcoxon Mann-Whitney test confirms this but only at a 10% significance level ($z = 1.867$, $\text{Prob} > |z| = 0.0619$).
- This finding proposes that females in mixed-environment settings are more altruistic than males in male only settings.

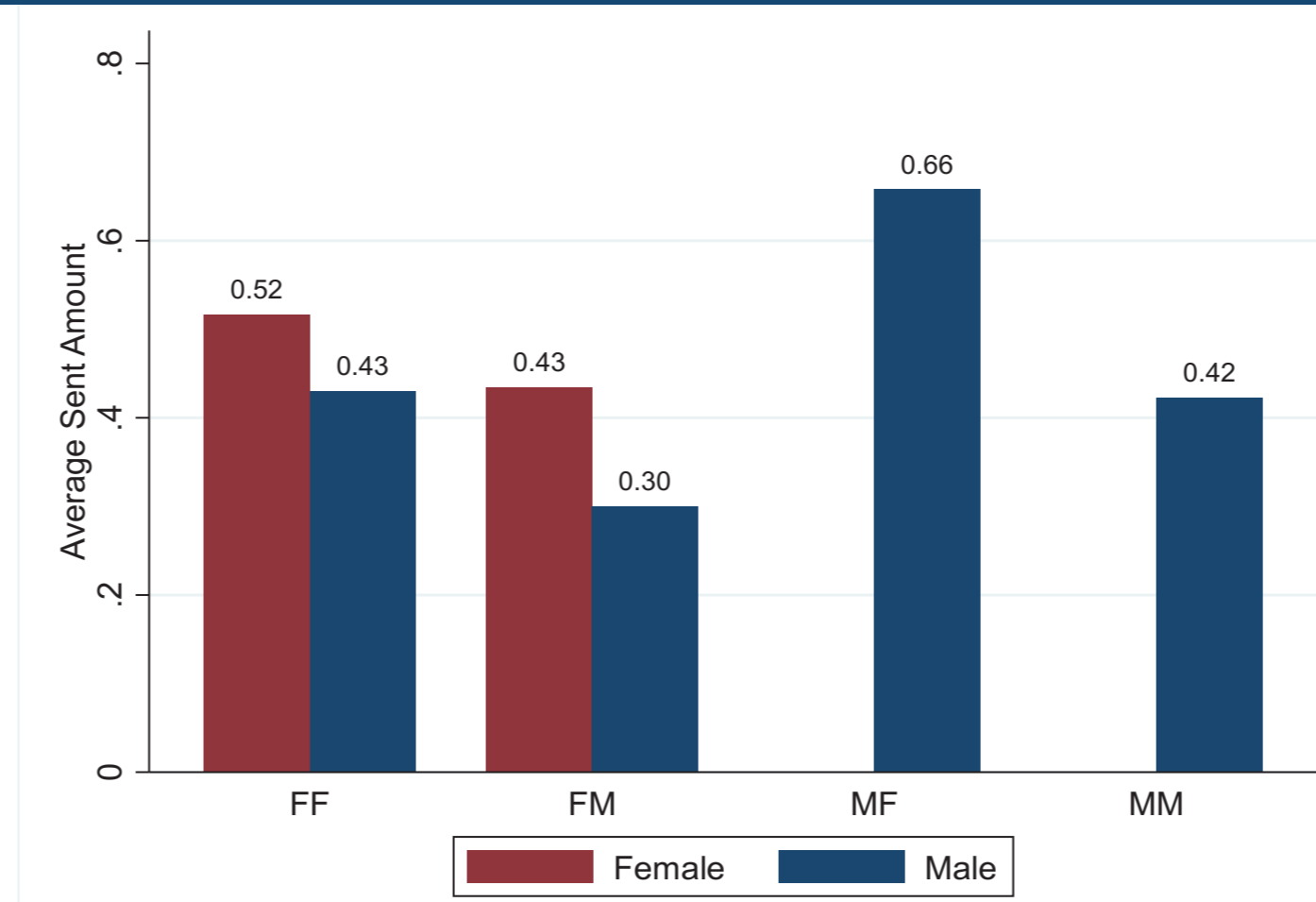
Figure 3: Average dictator sent amount over treatments



Trust Game – Trustor/Sender

- Firstly, we observe that the differences between the two male-only treatments (MF and MM) are highly significant at the 1% level ($z = 3.035$, $\text{Prob} > |z| = 0.0024$). This result implies that male trusting behaviour differs when being observed by two female researchers as opposed to a completely male environment with male researchers.
- Significant differences in male behaviour between FF and MF ($z = -2.938$, $\text{Prob} > |z| = 0.0033$) as well as FM and MF ($z = -3.344$, $\text{Prob} > |z| = 0.0008$).
- Substantially significant difference by male Trustors in the MF condition over all other conditions, suggests that the sex of the experimenter is an important facet that directs behaviour, particularly in environments where the sex ratio is extremely male-biased.

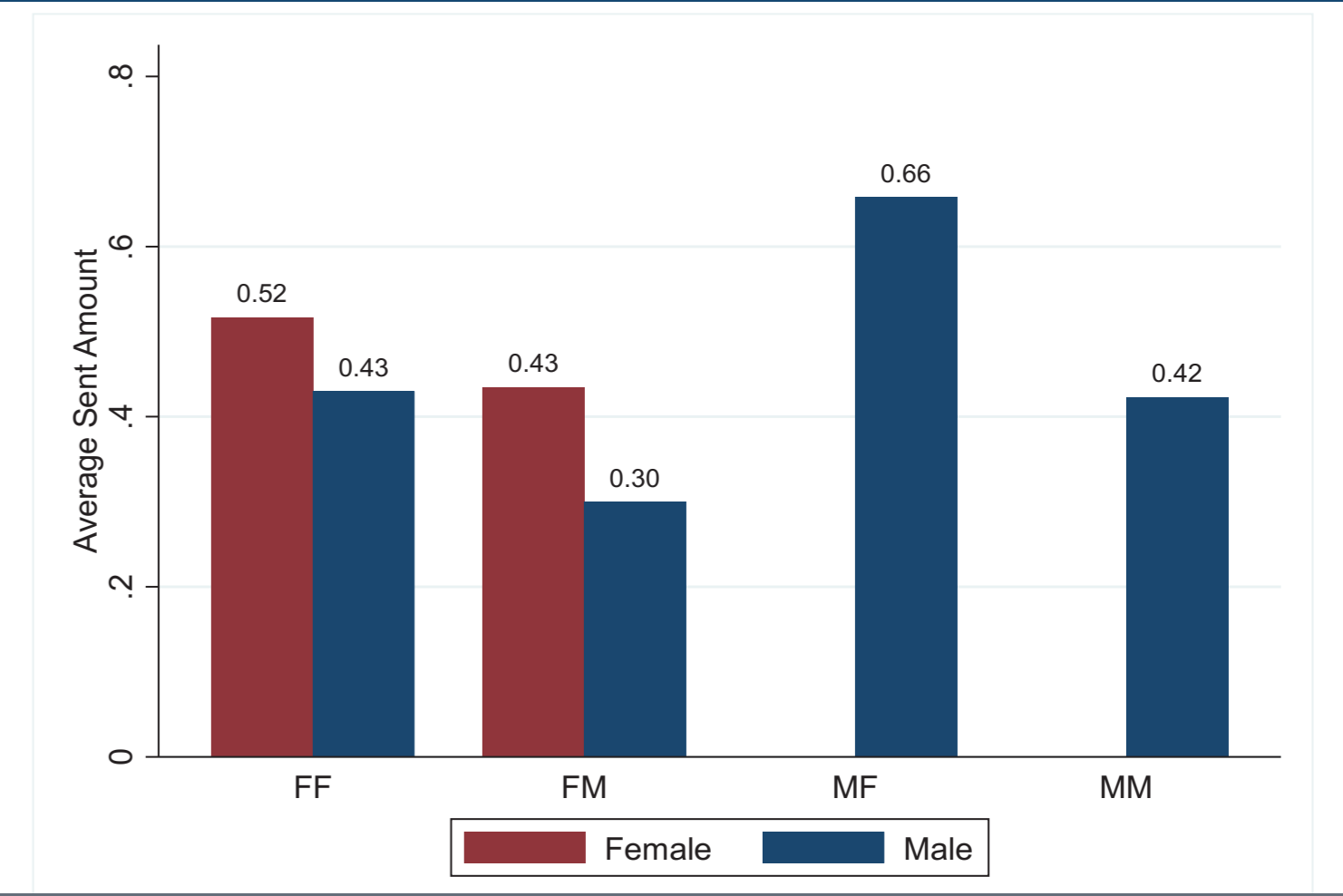
Figure 4: Average trust sent amount over treatments



Trust Game – Trustee/Receiver

- Figure 4 displays the average proportioned sent back amounts by the trustee. Firstly, we can see that there are significant differences between the two male only treatments at a 5% confidence level ($z = 2.017$, $\text{Prob} > |z| = 0.0437$).
- This result confirms that the presence of female experimenters within the environment are positively altering the way males reciprocate towards one another.
- Male only environments, including male experimenters (MM treatment), send back smaller amounts on average than all other treatments.

Figure 4: Average trust sent amount over treatments



LIMITATIONS

Sample size

- The number of observations collected across all treatments means the statistical analysis conducted in this study was not as robust as it could have been with a larger sample size.
- The sample size was limited primarily due to two reasons, 1) the funding constraints associated with the cost of incentivising's participants (participation fee) and employing the RA's (wages) to conduct the studies. And 2) the time constraint for data capture considering the Honours degree window of only approximately 9 months.

FUTURE RESEARCH

How attraction plays a role in the impact changes in the sex ratio.

- If changes in the sex ratio do in fact impact males decision making in economic games at a proximate level, behavioural & experimental economics research would do well to establish if the distal driver of such is in fact attraction to the opposite sex vs. pure male-male competition. Establishing if there is in fact a difference between the two as a male motivation in behaviour also allows behavioural & experimental economics to draw stronger multidisciplinary links with the biology and evolutionary psychology literature that has for more than a century explored inter-sexual and intra-sexual competition as a key driver in male-female behaviour in different and same sex groups.

Observe behaviour over multiple rounds of the implemented games

- For the purpose of econometric analysis, repeated iterations for each of the games played by participants would certainly provide greater analytical power. From a theoretical perspective, observations of repeated games would provide valuable information on both a learning or updating effect by males, but also whether risk, altruistic or cooperative behaviour increases or diminishes competitive behaviour both by males alone, and in mixed sex populations.