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Room composition effects on risk taking by gender

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Abstract

We present evidence of a direct social context effect on decision-making under uncertainty: the gender composition of those in the room when making individual risky decisions significantly alters choices even when the actions or presence of others are not payoff relevant. In our environment, decision makers do not know the choices made by others, nor can they be inferred from the experiment. We find that women become more risk taking as the proportion of men in the room increases, but the behavior of men is unaffected by who is present. We discuss some potential mechanisms for this result and conjecture it is driven by women being aware of the social context and imitating the expected behavior of others. Our results imply that the environment in which individual decisions are made can change expressed preferences and that aggregate behavior may be context dependent.

Keywords Gender · Decision context effects · Risk aversion · Experiment

JEL Classification C91 · D81 · J16

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1 Introduction

Our decisions and behavior can be strongly influenced by who is in our presence. Choices and actions may be different in groups of the same gender than in those of mixed gender. But, can we be influenced by the group gender composition, even if others have no bearing on our choices either now or in the past, and decisions are made in absolute privacy? Understanding whether such effects exist is important because they imply that the mere presence of certain others can affect the choices of individuals. The existence of these effects means that the gender composition of teams or even the design of the built environment, which dictates who one is surrounded by, could impact behavior.

Despite its relevance to understanding decision making, there is no direct evidence showing that who is in the room affects behavior, absent strategic interaction, information transfer, or payoff relevance of others' decisions. We address this by randomly varying the gender composition of the group present when decisions are made in an economic experiment. Importantly, the presence and behavior of those individuals provide no information and are not strategically or payoff relevant.

The results are striking. We find that the gender composition of the room alters individual behavior. Women are more risk taking as the proportion of men in the room increases, whereas men are unaffected. We explore several potential mechanisms for this change and conjecture it is driven by conformity and awareness of social context.

In our research design, individuals are invited to participate in a laboratory experiment on decision making and are randomly assigned to a particular date and time. After all participants arrive, they are randomly assigned to one of two rooms and a seat within the room. Each room is identical with four computers arranged around a table in a way that guarantees privacy of decisions but allows participants to naturally observe the gender composition of the room. At no point is the composition of the room, or gender, explicitly mentioned.

Participants are asked to make a series of eight decisions which consist of dividing \$10 between a certain option and a risky option.[1] The properties of the risky option change over the eight decisions and include lotteries with an expected value less than, equal to, and greater than one dollar per dollar invested. In each session, participants are randomly split into two two rooms to make these decisions.

The composition of the room, in our environment, can affect behavior only through some mechanism unrelated to payoff or behavioral information channels. By randomly assigning participants to experimental sessions, we minimize selection on unobservables and the chance that participants know one another or would interact with each other afterwards. By randomly assigning participants to one of two rooms, we generate different environments based on gender. By asking participants to perform a task that is individual in nature, we eliminate the effect of payoff dependence. By keeping decisions confidential and randomizing the presentation

[1] The design is based on Gneezy and Potters (1997). It is a simple design that requires participants to make a choice between how much to invest in a risky and safe lottery (Charness et al. 2013).

order of decisions, we make it difficult to infer any information on the decisions of others for a particular lottery. Finally, by randomizing the lottery used to calculate payoffs we reduce any meaningful earnings comparisons across participants, should they engage in such cheap talk after the experiment.

Consistent with previous research (Croson and Gneezy 2009; Eckel and Grossman 2008b), we confirm that women are more risk averse than men. This gives us confidence that our data are not atypical. Room composition has a significant effect on behavior, but it is one-sided. Women become less risk averse in the company of men, but men are unaffected by who is in the room. The effect for women is large—a woman is 3.5 times more likely to invest a dollar in a risky lottery when surrounded by men compared to when she is surrounded by women.

We consider several mechanisms and conjecture that this result is driven by women being more aware of the social context and adjusting their decisions to mimic the expected behavior of those surrounding them.[2] This is consistent with psychology studies which find that women are more likely to conform than men (Bond and Smith 1996), evidence that individuals guess correctly that women's behavior is more risk averse than men's (Eckel and Grossman 2008a) and social comparison theory (Levinger and Schneider 1969).

Our paper is not the first to experimentally investigate the role of audience or room composition on individual behavior. However, in other studies, the actions of participants are linked through behavioral, informational, strategic, or other payoff channels. For example, in bargaining, social dilemma or tournament experiments the choices of the other participants are strategically payoff relevant. In dictator experiments, the gender composition of the room may affect expectations about the gender of the recipient and thus be behaviorally relevant.[3]

The literature most closely related to our study examines gender composition of groups and risk attitudes. Adolescent girls are found to be more risk taking when in same-sex groups (Booth and Nolen 2012), and women become less risk averse over time in a same-sex class (Booth et al. 2014).[4] The results of these studies are consistent with research on gender differences in competitive attitudes (Gneezy et al. 2003; Niederle and Vesterlund 2007), where women are more likely to compete in same-sex groups, and suggest the importance of audience effects and signaling (Bohnet and Frey 1999; Charness et al. 2007; Andreoni and Bernheim 2009). By contrast, our results show that when competition, strategic interaction, payoff dependence,

[2] Gender differences in development and behavior appear early in life (McClure 2000; Zahn-Waxler et al. 2008; Baron-Cohen et al. 2005). One of these differences is that girls are better at reading the social environment than boys.

[3] See Eckel and Grossman (2001) for gender composition in ultimatum games, Gneezy et al. (2003) for tournaments, Bogan et al. (2013) for risk decisions of groups, Charness et al. (2007) for public and private decisions, Lindquist and Säve-Söderbergh (2011) for decisions in Jeopardy's daily double, Cooper and Rege (2011) and Rohde and Rohde (2011) for peer effects in risky decisions, and Ambrus et al. (2015) for aggregation of individual risk preferences.

[4] In Booth and Nolen (2012), adolescent boys and girls are randomly assigned to sit in 4-person groups in a large auditorium and complete five tasks in total, including a maze tournament with their group prior to choosing in a binary-choice lottery task.

previous interactions, feedback and audience effects are not possible, women are less risk averse in the presence of *men*, not women.

There are several implications of our results. Peer effects (Bertrand et al. 2000; Duflo and Saez 2003; Conley and Udry 2010) may be even more basic and fundamental, apart from those due to payoff relevant information transmission between group members.[5] If this is the case, some choices are a reflective reaction to who is in the room. This highlights the potential importance of the environment in which decisions are made. For example, if a woman makes more risky investments when in the presence of men, the surroundings in which women consider financial or retirement decisions could have an important impact on the ultimate financial health of women and their families. Our results also have organizational implications, since they suggest that aggregating individual preferences to predict group behavior would produce different outcomes than those produced by examining group behavior directly.

Finally, our results show that gender differences in behavior are not immutable. A woman's behavior in male-dominated activities could end up being similar to that of a man's. However, this might not be costless. While the observed behavior of both men and women might be similar, women might enjoy the task less. This would be consistent with women's preferences having a strong effect on job selection even in the absence of any other observable differences (e.g. Dohmen and Falk 2011; Buser et al. 2014).

The paper is organized as follows. Section 2 describes our experimental design, Sect. 3 shows results, Sect. 4 discusses potential explanations for the results, and Sect. 5 concludes.

2 Experimental design

The experiment is designed to identify the effect of different gender compositions of rooms on individual decisions over risky investments. The decisions that participants make are uncorrelated and independent to decisions made by others in the room, and this allows us to isolate the effect of room composition on decision-making.

We collect data from three different sites. At the first two sites (Georgia State University and Georgia Institute of Technology), an equal number of men and women (between 8 and 10 in total) are invited to participate in a randomly-assigned experimental session on a particular date and time. Participants cannot choose a different date or time. Upon arrival at the lab, participants are randomly assigned to one of two isolated rooms with identical setups. One room is called A and the other B. The letter of the room and a seat number is written on an index card. The index cards for the two rooms are shuffled in front of participants, and each participant chooses a face-down card assigning a room and a seat. This procedure produces randomly-determined room compositions and more rooms of mixed gender than rooms with

[5] This also speaks to Manski's (2000) point that peer effects are difficult to identify because they are confounded by information and strategy.

only one gender. Most sessions had two 4-person rooms, and because of no-shows, some had one or two of the rooms with 3 participants.[6]

At the third site (Vanderbilt University), the room assignment procedure differed slightly. We invited an equal number of men and women (10 in total) to assure 8-person sessions and focused data collection on same-sex and unequal mixed-sex rooms. In any session, the two room compositions are either same sex, (4 w, 0 m) and (0 w, 4 m), or mixed sex, (3 w, 1 m) and (1 w, 3 m). These room compositions are randomly assigned to days and times, and participants are invited to a randomly-assigned session date and time. Again, participants cannot choose another date and time. Upon arrival, participants are randomly assigned to the room compositions for that session.[7]

Apart from these differences in room assignment procedures, the experimental sessions proceeded identically across the three sites. We find no evidence that room composition is correlated with time of day. For our main results, we control for session fixed effects to account for differences in procedures, selection and any time of day effects. Our main results hold if we restrict the sample to only 8-person sessions and if we also include 6- and 7-person sessions as well. Both sets of results are presented in Table 1.

Each room has a table with four laptop computers arranged such that, when seated, each participant's computer screen is not visible to any other participant (see Fig. 1 for a picture of the room setup). There are no privacy dividers, and all participants can see everyone else in the room during the entire experiment. The room composition is never explicitly mentioned to the participants, but they can naturally see who else is in the room. Each laptop has a computer mouse to facilitate decision making, and there is a bingo cage with numbered balls on the table. Participants enter the room and sit at the seat number listed on their index card. The seat number also serves as the login number. The instructions for the experiment are on the computer screen, and the participants follow along as an experimenter reads the instructions out loud. Participants are not allowed to communicate with one another at any point during the experiment. A copy of the instructions is in the Appendix. Both experimenters were male and were randomly assigned to rooms as well.[8]

Participants make individual decisions over eight separate lotteries. The lotteries we use are similar to those used by Gneezy and Potters (1997) except that half of the investment decisions include the possibility to lose more than the amount invested. This measure of risk preferences is appealing to use because it is based on a simple, intuitive investment decision, rather than a multiple price list of binary lottery choices.

For each lottery, a participant is asked how many dollars out of $10 he would like to put in a lottery that pays H with 50% probability and L with 50% probability,

[6] At the first two sites, there are 21 8-person sessions and 14 6- and 7-person sessions. From the 8-person sessions, 6 of the 42 rooms are single-sex.

[7] At the third site, there are 12 8-person sessions, with 6 rooms each of (4 w, 0 m), (3 w, 1 m), (1 w, 3 m) and (0 w, 4 m).

[8] We find no evidence that room composition is correlated with either experimenter.

Table 1 Lottery investment by room composition and gender

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ordered logit	Ordered logit	Quantile reg	Quantile reg	OLS	OLS	OLS	OLS
	Invest	Invest	Invest	Invest	Zero Invest	Zero Invest	Ten Invest	Ten Invest
	Women	Men	Women	Men	Women	Men	Women	Men
Panel A: 8-person sessions								
Proportion of males	1.68*	− 0.77	3.00*	− 1.50	− 0.43***	0.20	− 0.05	− 0.08
	(0.94)	(1.00)	(1.79)	(2.21)	(0.14)	(0.16)	(0.13)	(0.17)
Randomization test *p* value	0.032	0.313	0.044	0.318	0.003	0.127	0.623	0.457
Observations	936	1176	936	1176	936	1176	936	1176
Num of participants	117	147	117	147	117	147	117	147
Session FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lottery FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared			0.28	0.35	0.21	0.26	0.15	0.25
Log likelihood	− 1968	− 2264	–	–	− 319.6	− 465.2	9.156	− 388.3
Panel B: 6-, 7- and 8-person sessions								
Proportion of males	2.13**	− 0.14	3.75**	− 0.00	− 0.53***	0.00	0.05	− 0.07
	(0.94)	(0.77)	(1.70)	(2.80)	(0.13)	(0.14)	(0.13)	(0.13)
Randomization test *p* value	0.000	0.766	0.000	1.000	0.000	0.981	0.422	0.529
Observations	1272	1576	1272	1576	1272	1576	1272	1576
Num of participants	159	197	159	197	159	197	159	197
Session FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lottery FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared			0.26	0.35	0.20	0.25	0.15	0.25
Log likelihood	− 2670	− 3036	–	–	− 455.8	− 614.7	28.35	− 530.6

All regressions in Panels A and B include standard errors clustered by participant as well as session-level fixed effects, a dummy for each lottery choice, proportion of non-whites in the room and a dummy for nonwhite. Panel B regressions also include a dummy variable for 3-person rooms

***$p < 0.01$; **$p < 0.05$; *$p < 0.10$

Fig. 1 Room setup for experiment

where H > \$1 > L. The participant can allocate any amount from zero to ten dollars, in one dollar increments, in the lottery. Any dollar not allocated to the lottery pays \$1 with certainty. For the eight lotteries, H can take on one of four values, {\$1.50, \$2.00, \$2.50, \$3.00}, and L can take on one of two values, {\$0, − \$0.50}. The eight lotteries are constructed from all possible combinations of H and L. Three of the lotteries have an expected payoff strictly less than \$1, two have an expected payoff equal to \$1 and three are strictly greater than \$1.

Figure 2 shows a picture of the decision screen for a lottery where H = \$1.50 and L = − \$0.50. The participant enters the amount of money he would like to allocate to the lottery in the box on the left side of the screen. On the right side is a table that lists total earnings for all possible amounts of money put in the lottery, conditional on whether the high payoff, H, or low payoff, L, is randomly chosen. The participant enters the amount to put in the lottery and clicks update. The payoffs for that decision are highlighted in the table. The participant is free to change his decision at any time and can easily move between the eight decisions to make changes. The confirm button for each decision must be clicked before all decisions can be submitted.

It is important to note that payoffs in the experiment depend only on the individual's own decisions and chance. The choices of the other participants in the room have no bearing whatsoever on an individual's payoffs. Our setup is different from previous studies that have looked at the effect of room composition because in those studies the actions or presence of others had some impact on an individual's payoffs or expectations. Our design, by contrast, allows us to measure the effect of the

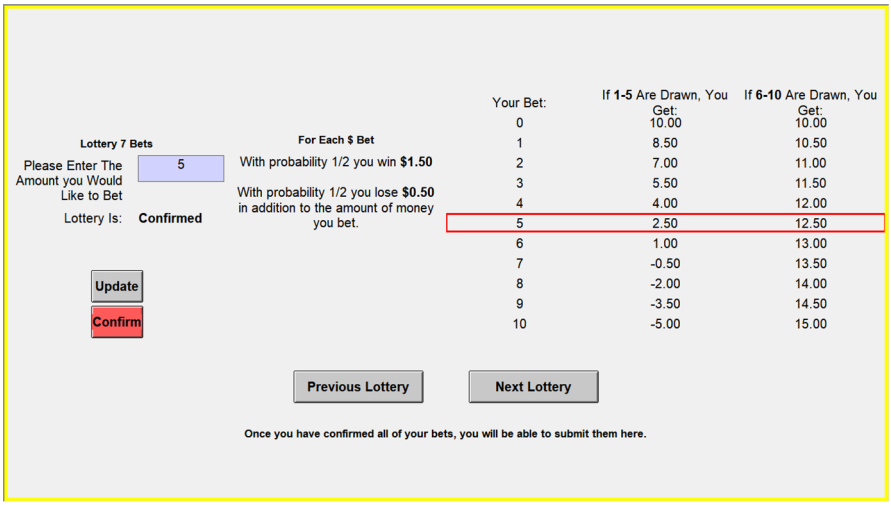

Fig. 2 Example decision screen for payoffs of \$1.50 or − \$0.50

environment (room composition) on decisions without these type of payoff or expectation confounds.

The eight lotteries are presented in a random order for each participant. Because of this, at any given time during the decision-making phase of the experiment, the individual participants in the room are making different decisions. This is an important element of the experimental design because it ensures that choices across participants for a particular lottery are uncorrelated. This allows us to further isolate environmental effects from choices.

Decisions are made on the computer. When all eight decisions are submitted by everyone in the room, one decision is randomly chosen to be paid by using the bingo cage. Eight balls, numbered 1–8, are placed in the bingo cage and mixed up in front of the participants. One ball is drawn from the cage, with the number on the ball corresponding to the decision number to be paid. Because the eight lotteries over which the participants made decisions are presented in a random order for each participant, paying for a particular decision number meant that each participant is ultimately paid for a different lottery.

Once a decision has been chosen to be paid, two more bingo balls are put in the bingo cage, numbered 9 and 10. The bingo cage is mixed up again, and a ball is chosen to determine the amount paid for the decision chosen. Bingo balls with numbers 1–5 paid one amount and balls numbered 6–10 paid another amount. Finally, whether the amount paid for each set of numbers is the larger or smaller amount (\$*H* or \$*L*) also differs across participants. This means that a draw of ball number 1, for instance, may pay a low return for one participant but a high return for another. All participants know these procedures ahead of time. Our protocol ensures that participants have little to learn from others decisions, attitudes or reactions. Participants make different decisions over the course of the experiment, and in addition, their payments are not correlated in any way.

Total earnings from the experiment include the payoff from the lottery chosen for payment plus a $6 show-up fee. Participants are paid in cash privately. Because the lotteries include losses, total earnings from the experiment could be as low as $1. Average earnings were $17.02 (SD $7.45), and the experiment lasted 30 minutes in total. In the 8-person sessions, across the three sites, there were 264 participants, 33 sessions and 66 rooms (each room had 4 people). The distribution of gender composition of the rooms is: 7 all-women rooms, 13 rooms with one man, 15 of equal number of men and women, 20 rooms with one woman and 11 all-men rooms.[9] Our main results include 8-person sessions and control for session fixed effects. We also present the results when 6-, 7- and 8-person sessions are pooled.

Over half of the participants were male (55.7%). The most common self-classifications for race are White (50.4%), Black (20.4%) and Asian (16.3%) with 12.9% in other classifications.[10] We control for the racial composition of the room in the data analysis and find no significant effect.

3 Results

There are two main results. First, we confirm that men are more risk taking than women. Second, the gender composition of the room affects the risk taking behavior of women but has no effect on men.[11] In particular, women become more risk taking in the company of men.

Our first result is illustrated in Fig. 3. The figure shows the average amount of money invested in the lottery by men and women for each of the eight lotteries. The lotteries are ordered from left to right such that the lotteries are increasing in expected value and variance. The first three lotteries on the left have an expected payoff of less than $1, the middle two have an expected payoff of $1, and the last three lotteries have an expected payoff greater than $1.[12] A risk neutral individual should not invest in the first three lotteries, should be indifferent in investing in the middle two and should invest all his $10 in the last three.

The figure shows that investment in the lottery increases for both men and women as expected payoff goes up. The amount of money invested, however, is always larger for men than women for every lottery, and it is significantly larger in four of the eight lotteries. This result confirms previous research both generally (Croson and

[9] When we combine 6-, 7- and 8-person sessions, there are 356 participants, 47 sessions and 94 rooms (74 4-person rooms and 20 3-person rooms). In these pooled data, the distribution of gender composition of the rooms is: 9 all-women rooms, 24 rooms with one man, 18 of equal number of men and women, 27 rooms with one woman and 16 all-men rooms.

[10] In the pooled 6-, 7- and 8-person sessions, 55.3% are male, 53.1% are White, 18.3% are Black, and 16.6% are Asian.

[11] Manski (1999) would call this a contextual effect (e.g. the propensity of the individual to behave in some way varies with the distribution of background characteristics of the group).

[12] Most participants (93.2%) are consistent, in that the average amount of money invested in lotteries with an expected payoff of $1 or more is at least as large as for those with an expected payoff of less than $1. On average, men are more consistent than women: 97% and 88% respectively.

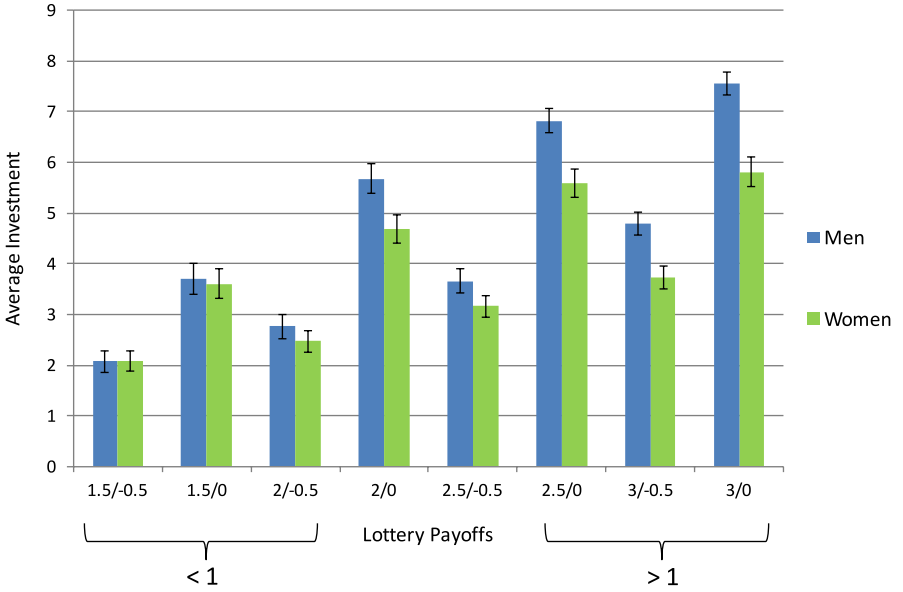

Fig. 3 Average investment by lottery and gender (error bars are standard errors of the mean)

Gneezy 2009) and specifically in tasks similar to the one used here (Charness and Gneezy 2012). It also gives us confidence that our data are not anomalous.

Our second result is illustrated in Table 1. The table presents regression results of the amount of money invested in the lottery as a function of the gender composition of the room, dummies for each lottery and session-level fixed effects. Fixed effects at the session level control for any time of day effects and imply that our results compare different randomly determined room compositions in the same time slot on the same day. Panel A presents the results for 8-person sessions only, and Panel B presents the results for the pooled data of 6-, 7- and 8-person sessions. The regressions are run separately for men and women, and gender composition is specified as the proportion of men in the room and ranges from zero to one (e.g. 0, 0.25, 0.33, 0.5, 0.67, 0.75, or 1).[13] Because of repeated observations over the eight lotteries, errors are clustered by participant.

Column 1 in Table 1 reports an ordered logit regression of the lottery bet on the gender composition of the room. The results show that women put significantly more money in the lottery as the proportion of men in the room increases. As an example, looking at the results from the 8-person sessions (Panel A), going from a room of all women to one of being the only woman in the room, the odds of investing an

[13] All results hold if we instead specify gender composition with dummy variables for whether the participant is the minority sex in the room or the room is composed of all the same sex. Women put more money in the lottery when they are the minority sex in the room. Results in Table 1 also hold if lotteries are grouped by expected payoff of> \$1, = \$1 and< \$1 (see Online Appendix).

additional $1 in the lottery increases by 3.5, all else constant.[14] Men, however, do not change the amount placed in the lottery as the gender composition of the room changes (column 2). This gender gap in response to the proportion of men in the room is significant.[15] As a robustness check, if we drop the all-female or all-male sessions and rerun the specifications in Columns 1 and 2, the main result still holds. Women invest more in the lottery as the proportion of men in the room increases, men do not, and the gender difference in response is significant.[16] The results for the pooled 6-, 7- and 8-person sessions (Panel B) are larger in magnitude and more statistically significant.

The remaining columns in Table 1 illustrate the effects of room composition on alternative measures of the lottery investment. Columns 3 and 4 report a median regression of the amount invested in the lottery. The results confirm that women invest more in the lottery as the proportion of men in the room increase and men are unaffected. In 8-person sessions, the median investment by women significantly increases by $3. Columns 5 and 6 report the results of a linear probability regression of a dummy variable that equals one if the participant invested zero dollars in the lottery. Women are significantly less likely to invest nothing in the lottery as the number of men in the room increases, and for men, there is no effect. The final two columns (Columns 7 and 8) report the effects of room composition on going "all in" the lottery (investing all $10). Room composition has no effect for women or men. Taken together, the results from Columns 5–8 suggest that the overall change in behavior of women is primarily due to a decrease in zero-bets as the proportion of men in the room increases. The results for the pooled sessions (Panel B) show similar effects.

To test the robustness and power of our results, we conducted a randomization test for each of the models presented in Table 1 by randomly re-assigning treatments. This procedure, originally due to Fisher (1960), is consistent with Young's (2019) recent approach to test the significance of experimental results. More specifically, in each of 1000 randomizations, the variable "Proportion of males" is permuted across rooms in our data. This is done separately for rooms of three and rooms of four. This allows us to randomly re-assign treatment while maintaining the structure of the data-generating process by assuring that each participant in a given room has the same randomly re-assigned treatment and receives a treatment consistent with the

[14] An ordered logit is preferred in this setting because the investment decision may be nonlinear. The return of a dollar invested in the lottery is different across lotteries and the marginal utility of a dollar gained could be decreasing as gains increase (in the case of a risk averse individual). The coefficient associated with the proportion of men in the room is 1.68, the odds conditional on a 0.75 unit increase in this variable is $exp(1.68 \times 0.75) \sim 3.5$.

[15] In a pooled regression with a dummy variable for being male and interaction terms with all the independent variables for the specification in Column 1, the coefficient on the interaction term on the proportion of males in the room is − 2.34 (p value of 0.088).

[16] Without the all-female sessions, the coefficient on the proportion of males in the room is 1.65 (p value = 0.071) for women and − 0.77 (p value = 0.444) for men. Without the all-male sessions, these are 1.68 (p value = 0.074) and − 1.16 (p value = 0.284) respectively. Testing the gender difference in response yields a p value of 0.087 without the all-female sessions and 0.053 without the all-male sessions.

number of individuals present in their room. For each randomization, we estimate each model presented in Table 1 and calculate the p value of the treatment effect by comparing the estimated coefficient on "proportion of males" for the actual data to the distribution of estimated effects in the randomized trials. This test was conducted using the *ritest* command in Stata (Heß 2017).

All our main results hold. The p values associated with these tests are reported in Table 1 and are similar to or stronger than those of conventional hypothesis tests for each of our regressions.

In sum, our results show that women are affected by who is in their presence when making individual choices over risky investments but men are not. Women become significantly less risk averse as the proportion of men in the room increases.

4 Discussion

In this section, we consider some possible explanations for our main result. Given that our study was not designed to test mechanisms, we discuss which explanations we can reject using auxiliary data from our experiments and conjecture which might be consistent with the results. Supporting evidence in this section is based on 8-person sessions, but similar results hold for the pooled data.

Room composition might prime gender identity. Since gender identity is more likely to be salient when a person is in the minority (McGuire 1984) and women are generally found to be more risk averse than men (Croson and Gneezy 2009; Eckel and Grossman 2008b), we would expect women to focus more on this aspect of gender identity in groups in which they are in the minority.[17] If risk aversion is seen as an expectation of how women should behave, then this mechanism suggests women's behavior would be most risk averse in groups where they are in the minority. As shown in Table 1, this is not the case and thus does not appear to be a plausible explanation.

In general, participants might feel rushed when making decisions because of the observable behavior of others in the room (e.g. time taken to finish the task, number of mouse clicks). We find that those who make their decisions faster also tend to make riskier choices. The correlation between the total time to complete all eight lottery decisions and the average amount invested in the lottery is -0.288 (p value $= 0.000$).[18] If women feel rushed to complete the task in the presence of men, they may make riskier decisions than in groups of women.[19] There is some evidence for this.

[17] Gender stereotypes of risk attitudes have been found to be persistent (see Grossman 2013; Grossman and Lugovskyy 2011).

[18] The total time to finish the task is the time it takes the participant to complete and submit all eight decisions. The correlation for women is -0.333 (p value $= 0.000$) and for men is -0.226 (p value $= 0.006$).

[19] Kocher et al. (2013) find that risk aversion over gains is not affected by being rushed while risk aversion over pure losses actually increases.

Table 2 Ordinary least squares regressions of time taken to submit decisions and number of clicks made by room composition and gender (8-person sessions)

Variables	(1) Time to submit Women	(2) Time to submit Men	(3) Num of clicks Women	(4) Num of clicks Men
Proportion of males	43.73	− 44.33	45.36***	− 18.95
	(50.09)	(41.80)	(17.01)	(22.12)
Constant	315.62***	332.80***	107.90***	147.72***
	(21.32)	(31.99)	(7.24)	(16.93)
Observations	117	147	117	147
R-squared	0.01	0.01	0.06	0.01

Standard errors in parentheses

***$p < 0.01$; **$p < 0.05$; *$p < 0.10$

In Table 2, columns 1 and 2 show OLS regression results of the total time taken to make decisions by men and women on room composition, and Columns 3 and 4 show similar regression results for total number of mouse clicks taken to make all decisions. Neither men nor women are significantly affected by room composition for time to complete decisions, but women have a higher number of mouse clicks as the proportion of men in the room increases. Table 3 (columns 1 and 2) shows that women invest more in rooms where others are making their decisions faster, whereas men are unaffected.[20] This suggests that women are paying attention to the time taken by others, may feel rushed and then make riskier decisions.

Participants might seek to either conform to or imitate the behavior of others in the group. Our findings are consistent with the joint hypothesis that women are aware of the social context, expect men to be less risk averse than women, and attempt to mimic the behavior of others in the room.

Eckel and Grossman (2008b) find that female participants are more risk averse than men and that this is correctly predicted by others. We collected incentivized data on beliefs at our third site (Vanderbilt). Participants were asked their beliefs of the average investment of the others in the room in three of the eight lotteries. They were paid $1 for one randomly chosen belief question if their answer was within $1 of the true average of the investments of others in the room.[21] Consistent with Eckel and Grossman (2008b), in our data both men and women expect the average investment of others to be larger when they are in rooms with more men, however these differences are small and not statistically significant.

[20] There is no significant effect of the number of mouse clicks on the average risky investment. Coefficients on the average number of clicks by others on average risky investment are − 0.005 (p value = 0.209) for women and 0.004 (p value = 0.378) for men.

[21] This procedure elicits a participant's belief about the modal $3 interval for the average bet of others.

Table 3 Ordinary least squares regressions of average investment, time taken to submit decisions and number of clicks by behavior of others in room and gender (8-person sessions)

Variables	(1) Avg investment Women	(2) Avg investment Men	(3) Time to submit Women	(4) Time to submit Men	(5) Num of clicks Women	(6) Num of clicks Men
Avg time taken by others	− 0.006***	0.002	0.440***	0.629***		
	(0.00)	(0.00)	(0.13)	(0.09)		
Avg number clicks by others					0.423***	0.683***
					(0.10)	(0.12)
Constant	5.731***	4.064***	190.938***	104.809***	70.095***	43.775***
	(0.62)	(0.63)	(43.35)	(30.01)	(12.84)	(16.15)
Observations	117	147	117	147	117	147
R-squared	0.08	0.01	0.09	0.24	0.14	0.19

Standard errors in parentheses

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$

Table 3, columns 3–6, show that both men's and women's time to complete the task and number of mouse clicks made are positively correlated with the time to finish and the number of mouse clicks made by others in the room. This is consistent with both men and women paying attention to the observable actions of others, however, only women are affected by the composition of the room. Women may internalize the social context and mimic what others around them are likely deciding to do based on their gender. In this way, our results are consistent with the tendency of women to conform more than men as shown in the Asch and Guetzkow (1951) line of conformity studies (Cooper 1979; Eagly and Carli 1981; Bond and Smith 1996) and social comparison theory (Levinger and Schneider 1969).

In sum, we conjecture that our main finding, that women become less risk averse as the proportion of men in the room increases, may be driven by women taking into account the social context, feeling rushed and conforming to the expected behavior of others.

5 Conclusion

We examine the influence of social context on individual decision making in the absence of behavioral information feedback, strategic interaction or payoff relevant information. To do this, we randomly assigned experimental participants to sessions and within sessions to two different rooms and asked them to make a series of private lottery decisions involving gains and losses. Participants faced menus that were personalized in terms of the order in which the lotteries were presented, the lottery selected to determine payoffs and the randomizing device used with each individual. That is, experimental participants faced completely individualized decisions with no meaningful way to link their decisions, payoffs and actions to the decisions, payoffs and actions of other participants in the room.

We find that, even under these strict conditions, individual decisions are strongly influenced by the gender composition of the room: women become less risk averse as the proportion of men in the room increases. The effect is large. A woman is 3.5 times more likely to place a dollar in a lottery when surrounded by men compared to when she is surrounded by women.

The results are most consistent with research showing women are more likely to conform than men (Bond and Smith 1996). We conjecture that the results may be driven by women paying attention to their surroundings and incorporating the social context into their decisions by matching their choices to a common expectation of how men and women decide when making risky investments.

Our experiment shows that the characteristics of those around us have an effect on decisions independent of feedback or payoff-relevant information. Decisions over risky alternatives made while surrounded by others are affected by the gender mix in the room even when decisions are individual and uninformative to the decisions of others. The effect is manifested in the decisions of women, not men, and seems to be due to the activation of homegrown expectations and imitation.

The findings depart from previous literature that has found women more risk taking and competitive in same-sex groups and suggest that once other interacting

factors have been removed preferences are expressed differently. The results also have implications for the measurement of individual preferences and their aggregation. Depending on the environment in which individual decisions are made, individual and aggregate preferences could differ significantly, even when decisions are private. It also shows that women might adapt more to their environment than men independent of their underlying preferences. The composition of one's peers, co-workers or friends could have a fundamental effect on preferences, apart from payoff-relevant information.

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