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Gender composition and group dynamics: Evidence from a laboratory experiment with microfinance clients

Lars Ivar Oppedal Berge[a,b,*], Kartika Sari Juniwaty[c,a,1], Linda Helgesson Sekei[c]

[a] NHH Norwegian School of Economics, Helleveien 30, 5045 Bergen, Norway
[b] Chr. Michelsen Institute, 5892 Bergen, Norway
[c] Umeå University, 901 87 Umeå, Sweden

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ABSTRACT

We investigate the effect of gender composition on the group dynamics of microfinance clients in Tanzania using a laboratory experiment. We focus on three dimensions: (i) the ability to collaborate on problem-solving, (ii) joint decision-making in risk taking, and (iii) the willingness to cooperate in a public-goods game. Our main finding is that female groups are better at collaborating in problem-solving than male and mixed groups, and are also more willing to take risks. However, in the public-goods game we find no robust evidence of female groups contributing more than male and mixed groups. Our findings suggest that one reason why female loan groups often have higher repayment rates than male and mixed groups may be that female groups are more able to collaborate and find common solutions to common challenges.

> "Loan group composition should be based on gender; once you have a single man in a group of women, there is a problem." (Female loan-group member)

1. Introduction

Microfinance institutions (MFIs) typically require borrowers to form joint liability groups as a substitute for the lack of physical or financial collateral.[1] There are a number of joint decisions to be made in a loan group, and the ability and willingness of its members to collaborate and cooperate is clearly of great importance. For instance, if someone in the loan group has a problem with their business and their loan repayments, members must jointly find solutions and decide how to deal with this. Similarly, when a member applies for a larger loan, the loan group members must jointly decide whether to accept the increased risk that this creates for the loan group.[2]

* Corresponding author at: Norwegian School of Economics, Helleveien 30, 5045 Bergen, Norway.
E-mail address: lars.ivar.berge@nhh.no (L.I.O. Berge).
[1] Center for International Forestry Research, Bogor 16115, Indonesia and Universitas Indonesia, Depok 16424, Indonesia.

[1] For an excellent survey of the economics of microfinance, see Armendáriz de Aghion and Murdoch (2010). For recent evidence on the general impact of microcredit, see Banerjee et al. (2015). See also, for example, Giné and Karlan (2014) and Giné et al. (2010) who study the impact of joint liability and other loan group features.

[2] Microfinance proponents also argue that the loan group structure can create non-financial benefits for its members, in particular for women, who may have limited other possibilities to meet outside their homes to discuss business, and potentially also do business together (Feigenberg et al., 2014).

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Given the growth of MFIs, and the importance of such institutions for the development of small-scale business in poorer countries, designing and composing well-functioning loan groups could potentially be of great importance for poverty reduction and development. While many researchers have examined different features of loan groups, such as joint liability and the role of frequent repayment, few discuss the role of loan group composition. Exceptions include Anthony and Horne (2003) and Sharma and Zeller (1997), who both find that the percentage of women in a loan group correlates positively with individual repayment rates. Similarly, D'Espallier et al. (2011) find that having a higher percentage of women clients in MFIs is associated with lower portfolio risk, fewer write-offs, and fewer provisions, while Wydick (1999) reports that gender heterogeneity negatively influences informal provision of insurance in loan groups.

> Loan group composition should be based on gender; once you have a single man in a group of women, there is a problem. (Female loan-group member)

Although indicative, these studies do not provide information about mechanisms that may explain why women-dominated groups tend to avoid repayment problems, and they have not established a causal relationship between gender composition and loan group outcomes.

In this paper, we report from a lab experiment conducted among microfinance clients in Tanzania, where we randomly allocated the microfinance clients into groups in the lab. This experimental design allows us to explore how gender composition of (lab) groups influences three important dimensions of group dynamics among microfinance clients; the groups' ability to collaborate and solve a common challenge, the willingness to take risks as a group, and the willingness to cooperate and contribute to resolving a social dilemma. We believe that our group games may shed light on the group dynamics of the loan groups also outside the lab.

Ability to collaborate is measured based on how groups solve multiple-choice problems face to face. This problem-solving exercise captures real-life situations in which loan group members must work together to find solutions to common challenges.

Willingness to take risks as a group is captured by letting groups decide jointly, face to face, whether to invest in a risky asset or not. This game resembles real-life situations in which loan groups must make joint decisions involving risk, such as accepting group members' loans or investment projects.[3]

Willingness to cooperate is measured based on the groups' contributions in a public goods game. Unlike the group games on ability to collaborate and risk-taking, contributions in the public goods game were done anonymously. This game captures an essential dimension of cooperation in many group settings, namely the issue of individual free riding at the cost of the group's common welfare.

Our main finding is that group composition shapes the groups' ability to collaborate: all-female groups outperform both mixed and all-male groups in the problem solving game, even though women perform no better than men at the individual level. Moreover, we also find evidence of all-female groups taking more risk than mixed groups, and to some extent we also find that all-female groups take more risk than all-male groups. On the other hand, in cooperation-game, we find no robust evidence of female groups contributing more than male and mixed groups to the public good.

We contribute to the experimental literature on group dynamics along two dimensions. To our knowledge, we are the first to use a face-to-face problem-solving exercise in order to shed light on how gender composition may influence groups' ability to collaborate, and our findings indicate that this dimension may capture important gender differences.[4] Moreover, our study is also among the first to investigate how gender composition shapes a group's common risk decision in a face-to-face environment.

While there are few previous studies to contrast our findings in the problem-solving exercise, Booth and Nolen (2012a) found similar patterns as in our risk-game, as they found that young girls behaved less risk-aversely in a lottery task when assigned to groups of girls or attending single-gender schools.[5] However, Castillo et al. (2015) found that women in fact took more risks as the share of men in the room increased, contrasting our findings from the risk game. On the other hand, the (lack of) findings in the public-goods game are in line with most previous studies investigating public-goods games, suggesting that neither gender nor gender composition is important when explaining contributions (see Sell et al., 1993; Eckel and Grossman, 2008).[6] However, investigating behavior in a prisoner's dilemma game Charness and Rustichini (2011)

[3] Sharma and Zeller (1997) suggest that one reason why female loan groups may be better at repaying loans is that they invest in less risky projects.

[4] Face-to-face communication has also previously been used in experimental settings, such as in Bochet et al. (2006), studying public good contributions. In a survey article, Sally (1995) found that non-binding face-to-face communication increased contributions substantially in games with voluntary contribution mechanism.

[5] Investigating willingness to compete, Booth and Nolen (2012b) also found that the gender of peers mattered, as they found that girls from single-sex schools behaved more like boys, and that girls from single-gender experimental groups were more competitive than girls from mixed experimental groups. Furthermore, also investigating the role of group composition, Dufwenberg and Muren (2006) found that women-dominated groups were more generous and egalitarian, although the most generous groups were those with two men and one woman.

[6] In the experimental literature on general gender differences, it is well established that there are systematic gender differences in preferences. For instance, men are more willing to take risks and to compete, and men and women react differently to changes in the decision-making environment (see, e.g., Niederle and Vesterlund, 2007; Croson and Gneezy, 2009; Charness and Gneezy, 2012)

found that men cooperated less often when observed by other men, whereas women cooperated more often when observed by other women.[7]

We also contribute to the literature on microfinance and loan groups by conducting our experiment with small-scale entrepreneurs who are members of loan groups. Our findings suggest that one reason why female loan groups are found to do well (see Anthony and Horne, 2003; Sharma and Zeller, 1997) may be that female groups are more able to collaborate than male and mixed groups.[8]

The rest of the paper is organized as follows. In Section 2, we describe the experimental context and design. In Section 3, we explain our empirical strategy. In Section 4, we present our results, while we discuss our findings in Section 5. Section 6 concludes the paper.

2. Experimental design

2.1. Experimental context and sample

The experiment was conducted in October 2010 at Research on Poverty Alleviation (REPOA), a research institute in Dar es Salaam, Tanzania. To conduct the experiment, we invited 309 microfinance clients from the Buguruni branch of Tanzania's largest MFI, the Promotion of Rural Initiative and Development Enterprises (PRIDE), to earn money at a "Workshop on Microfinance and Entrepreneurship". 229 of the invitees attended the workshop.

At the time of the experiment the participants were all members of loan groups each consisting of five borrowers. PRIDE employs a modified Grameen Bank model, and approximately 65% of its clients are women.[9] Most importantly, group members are jointly liable for each other's loans and must attend weekly loan meetings. That is, if group members do not repay their loans, or do not attend a loan meeting, their peers must step in. Otherwise, the whole group will be denied future credit. Therefore, group members have incentives not only to monitor their peers' investments and businesses, but also to help group members by sharing business knowledge and experience. According to the MFI, group members partly self-select into groups and are partly assigned randomly to groups with fewer than five members in the case where empty spaces exist due to exit of members.[10]

Borrowers must have a business in order to obtain a loan. According to the guidelines, loans must be spent on the business, although monitoring by PRIDE is limited. Because of this requirement, most PRIDE members are self-employed. Both male and female members are often involved in small-scale commercial activities, such as running small kiosks or vegetable stalls, while females are more often than males involved in various service-businesses (often outside the home), including hairdressing and tailoring. Men, on the other side, tend to be more often than women involved in light manufacturing, such as carpentry or brick making. According to previous studies of PRIDE clients from the same branch (Berge et al., 2015), average profits for these types of entrepreneurs are around 20,000 Tanzanian Shillings (TZS) per day.[11] Although median profit is somewhat lower, most households' earnings likely exceed the international poverty line of 1.25 USD per day per household member.[12]

Table 1 presents descriptive sample statistics on the subjects participating in the lab experiment. As in PRIDE, women are in the majority, making up 56% of the sample, and their average age is 36 years.[13] Lab participants have on average slightly more than seven years of education. Nearly 90% have completed primary school, with nearly all being able to read. Participants have an average of 1.5 businesses each. These are often complementary businesses such as tailoring and reselling of clothes, or running a small restaurant as well as a kiosk. On average, participants have been with PRIDE for nearly three and a half years, and average savings are almost 50% of the average loan. Weekly savings are compulsory and also serve as partial collateral. With average loan sizes of 300,000 TZS (Around 200 USD), most participants have not reached the top of the group-loan ladder, which at the time of the experiment was 1,000,000 TZS.[14] Approximately 40% of the participants were in loan groups composed exclusively of members of the same gender. Although most background characteristics are

[7] Charness and Rustichini suggest that the underlying mechanism is that males wish to signal their formidability while females wish to signal their cooperativeness.

[8] Our study also speaks to the broader literature on the effect of gender composition. For example, in a business-game study of students, Apesteguia et al. (2012) find that both mixed and male teams outperform female teams. By contrast, in the context of student group performance in a business strategy game, Fenwick and Neal (2001) conclude that groups may be more effective when women outnumber, or at least equal, men. Smith et al. (2006) and Ahern and Dittmar (2012) consider the effects of the gender composition of corporate boards. The former conclude, unlike the latter, that the inclusion of women board members may improve firm performance. In the context of economic development, Chattopadhyay and Duflo (2004) find that women leadership in village councils in India influences the kinds of public goods provided.

[9] Details of PRIDE can be found at http://www.mixmarket.org/mfi/pride-tza or http://www.mftransparency.org/microfinance-pricing/tanzania/023-PRIDE_Tanzania/

[10] Data from other studies based on similar PRIDE clients, such as Berge et al. (2015), indicate that yearly dropout rates are at least 20%; where dropout rates are higher among clients with small loans than among clients with large loans.

[11] 20,000 TZS was approximately equal to 13.5 USD (exchange rate at November 1st, 2010).

[12] See Berge et al. (2015) for more information about PRIDE clients and their businesses.

[13] In PRIDE as a whole, between 60% and 80% of members are women, according to www.mftransparency.org (http://www.mftransparency.org/microfinance-pricing/tanzania/023-PRIDE_Tanzania/), accessed July 20th, 2015

[14] All clients must start with small loans and gradually apply for larger loans. Only around 2% of PRIDE members have individual loans, which typically are substantially larger than the largest group-based loans (http://www.mftransparency.org). PRIDE did not have a bank license at the time of the experiment and therefore could not take deposits in addition to the compulsory weekly savings.

Table 1
Sample characteristics.

	N	Mean Full sample (1)	Male (2)	Female (3)	*p*-value Female = Male (4)
Proportion female (number of m/F)	229	0.56 (0.50)	(100) (0.00)	(129) (0.00)	0.00
Age	211	36.12 (8.15)	35.02 (8.54)	36.93 (7.78)	0.09
Years of education	229	7.20 (1.99)	7.21 (1.74)	7.19 (2.16)	0.95
Proportion able to read	229	0.97 (0.18)	0.96 (0.20)	0.97 (0.17)	0.72
Number of businesses	216	1.55 (0.63)	1.48 (0.62)	1.60 (0.64)	0.18
Years of PRIDE membership	213	3.46 (3.25)	3.36 (3.20)	3.54 (3.29)	0.69
PRIDE loan	227	289.427 (275.670)	312.121 (260.205)	271.875 (294.256)	0.28
PRIDE savings	227	136.469 (111.433)	143.686 (129.070)	130.887 (95.760)	0.39
Proportion in single-gender groups at PRIDE	229	0.38 (0.49)	0.10 (0.30)	0.60 (0.49)	0.00

Note: The table shows non-lab summary statistics by gender. *p*-values are from *t*-tests of equality. Standard-deviations in parentheses. Loan and savings are in thousands of TZS. Unfortunately, sample sizes differ because of missing data. In the full sample of 229 participants, 129 were women and 100 were men.

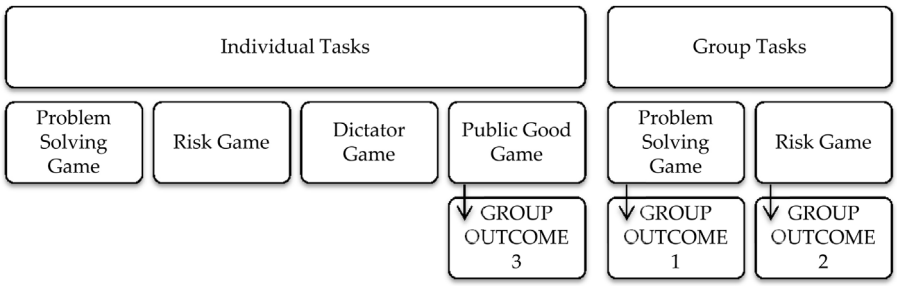

Fig. 1. Tasks in each Session.

fairly gender balanced, only 10% of male participants, compared with 60% of female participants, belong to single-gender groups. This reflects the fact that the majority of PRIDE members are women, which makes it easier for women to team up with other women, but it may also indicate a preference among women for female-only groups.

2.2. Overview of experimental design

Fig. 1 provides an overview of the lab design. The lab sessions comprised an individual component and a group component. In the former, participants made decisions on their own, without any communication with other participants. For the group session, participants were assigned to groups of four and asked to make joint decisions for the whole group, based on full face-to-face communication. All games were played independently.[15] We conducted six sessions with different participants, each lasting approximately three hours. The experiment was single blind.

2.2.1. Individual games

Participants were required to solve or make decisions in four individual games, where there was no communication with other participants: a problem-solving game, a risk game, a dictator game and a public-goods game. The first task conducted in the lab was the individual problem-solving game. Participants were asked to solve ten multiple choice problems relating to business and other topics. For each correct answer, clients received 150 TZS (about ten US cents).[16]

In the second task, participants had to make two decisions involving risk. In the first round, they could either make a safe investment, from which they with certainty would receive 1000 TZS, or they could gamble and receive either zero or 2500 TZS with equal probability. In the second round, the safe bet was increased to 1500 TZS, and the gamble was left unchanged.[17] Before participants made their first decision, they were told that the outcomes of the lotteries would be determined at the end of the session by asking one of the participants to pick one of two envelopes, each containing a sheet of paper; on one of which was written 'Lucky,' and on the other "Unlucky."

In the third task, participants played a standard dictator game. In this game, each participant received 1000 TZS, which they could either keep or share with another PRIDE client. This game was played twice. In one round, the dictators were told that the recipient was a man, and in the other, they were told that the recipient was a woman. The order of the two dictator games was varied randomly to avoid systematic differences.

[15] Instructions were given in Kiswahili. See the Appendix for the English translation.
[16] As a comparison, a typical meal with rice, beans, and meat costs approximately 1500 TZS.
[17] Unfortunately, a design mistake was made, so that the second risky bet would only make sense for risk-loving participants. We therefore only consider the first risk choice throughout our analysis.

The last individual game was a public-goods game, in which participants were assigned randomly to either single-gender or mixed-gender groups, each consisting of four participants.[18] Although we made participants aware of their group composition, they could not identify the other group members or cooperate with them in any way. This "individual group game" therefore differs substantially in nature from the group games with full face-to-face interactions, described in the next section. Furthermore, each participant in the public goods-game received an endowment of 2000 TZS, which could either be kept in a private account or donated to a group fund. Contributions to the group fund were doubled and then shared equally among the group members.[19] In addition to deciding how much to contribute to the group fund, participants were asked to state their beliefs about how much they thought their group members would contribute. Mixed groups comprised two women and two men. Because the gender composition and number of participants did not always match our randomization, we ended up with a sample of 208 participants in the public-goods game, with 17 female-only groups, 13 male-only groups, and 22 mixed groups.

2.2.2. Group games

After playing the individual games, we assigned participants randomly to mixed and single-gender groups; we ended up with 22 mixed groups, 12 male-only groups, and 18 female-only groups.[20] These groups were kept together throughout the group sessions. It was made clear that the amount earned by each group in these games would be shared equally among the four group members. Unlike in the individual games, in the group games, participants sat around a table and could freely communicate and interact with other group members, and the group were required to come up with one set of answers and choices for the whole group.[21]

The first group task was another round of the problem-solving game with similar types of problems as in the individual round, where group members jointly decided how to answer the set of multiple-choice questions. For each correct answer, the group received 600 TZS to be shared equally between the four members.

To complete the group session, another set of risk games was played. The group game was identical to the individual risk game, except that all payoffs were multiplied by four.

3. Empirical strategy

To estimate the impact of group composition, we estimate the following equation:

(1) $Y_i = \alpha + SingleGender_i\ \beta 1 + (SingleGender_i \times Male_i)\ \beta 2 + \varepsilon_i$ where Y_i is the group outcome of interest; that is, (i) the number of problems solved correctly, (ii) whether the group decided to take a risk, and (iii) the group's total contributions in the public-goods game. *SingleGender* is a dummy variable that takes a value of one if the group consists of only males or only females, and is zero otherwise. *Male* is a dummy variable that takes a value of one if the group consists of males only, β_1 therefore measures the difference between mixed and female-only groups, while β_2 measures the difference between female-only and male-only groups.[22] At the bottom of the tables we also report the sum of β_2 and β_1, which measures the difference between mixed groups and all-male groups.

In the regressions we also include a set of group-average covariates; i.e., average loan size, average years with the MFI, average years of education, average age, average dictator contributions, and the number of group members who can read.[23] Furthermore, when analyzing the problem-solving game, we control for two different measures of the group's "knowledge endowment."[24]; We also control for individual risk in the group risk game and for average beliefs in the public-goods game. In particular, beliefs may be important to control for because subjects in public-goods games are largely conditional cooperators (Chaudhuri, 2011).

All regressions are estimated by the ordinary least squares (OLS) method, apart from when analyzing the risk game. For this, as the dependent variable is binary, we use a probit model and report the marginal effects.[25]

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[18] Participants could see how the randomization was conducted.

[19] We explained the game thoroughly by conducting role-plays with research assistants as models.

[20] Because the draws in the public-good games and the other two group games were not identical, the sample of 208 participants did not overlap perfectly in both draws. All our analysis was based on these non-overlapping samples of 208 participants.

[21] Each group had a question sheet and used a pen to record responses directly on the sheet.

[22] One should interpret $\beta 2$ with some care, as the estimated coefficient measures the difference between male and female groups. It should not be given a causal interpretation because an individual cannot, by definition, belong to both a male and a female group.

[23] To control for dictator contributions, we use the relevant gender contribution; e.g., we use contributions to a female if the participant was in a female-only group, and analogously for male participants in male-only groups. For participants in mixed groups, we use the average contribution to male and female recipients.

[24] First, we simply calculate the average of the individual scores in round 1. Then to calculate "Max group endowment," we first create an indicator variable equal to one if at least one group member got the answer correct. Then, we summarize over all ten questions. In this way, we should be able to capture the spread of knowledge within a group, which may be useful when four individuals team up.

[25] Probit estimates from the risk game are similar to the OLS estimates, but the *p*-values from the probit models were slightly lower than those obtained from OLS.

Table 2
Summary statistics on individual tasks in the lab.

	Females in			Males in		
	Mixed group (1)	Single-gender group (2)	*p*-value Mixed = single (3)	Mixed group (4)	Single-gender group (5)	*p*-value Mixed = single (6)
Individual knowledge score	4.95 (1.60)	5.21 (1.56)	0.40	5.80 (1.97)	5.71 (1.62)	0.82
Proportion individual risks taken	0.45 (0.50)	0.53 (0.50)	0.45	0.45 (0.50)	0.54 (0.50)	0.41
Number of obs.	*44*	*72*		*44*	*48*	
Dictator contribution to males	455.68 (301.40)	409.56 (205.02)	0.34	462.50 (271.11)	423.08 (230.61)	0.44
Dictator contribution to females	488.64 (297.44)	431.61 (207.49)	0.23	426.13 (230.39)	419.23 (244.98)	0.89
Public-good contribution	1081.80 (845.86)	1113.2 (743.31)	0.84	954.50 (847.83)	932.7 (857.66)	0.90
Number of obs.	*44*	*68*		*44*	*52*	
Public-good beliefs	1162.3 (520.75)	1005.2 (673.35)	0.20	1234.10 (505.34)	1171.80 (490.63)	0.54
Number of obs.	*42*	*67*		*43*	*52*	

Note: The table presents summary statistics from individual-level games, by gender and type of group. We report standard deviations in parentheses. Note that samples are not perfectly overlapping. *p*-values are from *t*-tests of equality. Knowledge and risk are tabulated by the groups used in the problem-solving and risk-game, whereas dictator contributions, beliefs about public-good contributions, and public-good contributions are tabulated by the groups used in the public-good game. Unfortunately, not all participants stated their beliefs group members' public-good contributions; we therefore miss four observations for this measure.

Table 3
Summary statistics of group games in the lab.

	Means			*p*-value		
	Male groups (1)	Female groups (2)	Mixed groups (3)	Male = Female (4)	Male = Mixed (5)	Female = Mixed (6)
Correct answers in group	7.66 (0.65)	8.44 (0.78)	7.54 (0.86)	0.01	0.67	0.00
Proportion of group taking risks	0.25 (0.45)	0.44 (0.51)	0.18 (0.39)	0.30	0.65	0.08
Number of observations	*12*	*18*	*22*			
Public-good contribution	932.7 (410.2)	1113.2 (323.6)	1018.2 (477.9)	0.19	0.59	0.49
Number of observations	*13*	*17*	*22*			

Note: The table shows summary statistics from the group outcomes, by type of group. *p*-values are from *t*-tests of equality. We report standard deviations in parentheses. Public-good contributions are defined as the average contribution of the group members. Note that samples are not perfectly overlapping, and the groups were not identical in the knowledge/risk and public good games.

4. Results

4.1. Descriptive statistics

Table 2 shows descriptive statistics for individual lab outcomes by gender and type of group. Table 3 shows group-level descriptive statistics for male-only, female-only, and mixed groups. As can be seen from Table 2, at the individual level females answered around five out of ten problems correctly, while males answered slightly less than six problems correctly. As participants were randomly assigned to groups at a later stage, the non-significant differences between females assigned to either mixed or single gender groups, and between males assigned to either mixed or single-gender groups, indicate that the randomization worked well along this dimension

Furthermore, depending on the type of group participants were assigned to at a later stage, 45%–54% chose the risky investment, with patterns for men and women being virtually identical. Although not reported in the table, there are no significant gender differences in individual risk-taking, which contrasts with results from other studies of gender differences in risk preferences (Croson and Gneezy, 2009). This may be due to the fact that all our participants are entrepreneurs and members of PRIDE.[26]

[26] The lack of gender differences in individual preferences may also be due to the type of risk-eliciting task that we use. For example, in a study based on similar PRIDE clients but using a different risk measure, Berge et al. (2015) find that women are less eager to take risks than males. Berge et al.'s risk measure differed from ours, in that they summarized the number of times the participants chose the risky option while gradually increasing the value of the safe option.

Contributions in the dictator game are rather high, ranging between 409 TZS and 488 TZS of participants' endowments of 1.000 TZS. Moreover, we note that participants weakly favor their own gender.[27] Again, we see no difference in behavior between those assigned to mixed and single- gender groups.

In the public-goods game, participants could contribute up to 2000 TZS and, on average, believed that their group members would each contribute 1005–1234 TZS; participants' own average contributions were slightly lower (954–1113 TZS). Note that participants were randomly assigned to either single-gender or mixed public-goods groups, and the high *p*-values from the *t*-test indicate that public goods contributions are not influenced by group members' gender.

Table 3 shows descriptive statistics for the group games, for male, female, and mixed groups. In the group game, measuring participants' ability to collaborate, we find that female groups significantly outperform both male and mixed groups. Female groups answered on average 8.44 questions correctly compared with 7.77 and 7.54 for male and mixed groups, respectively. Similarly, whereas 44% of female groups chose the risky investment, only 25% of male groups and 18% of mixed groups did so. *t*-Tests reveal that female-only groups take significantly more risk than mixed groups (p = 0,08), while the difference between male-only and female-only groups is not significant (p = 0,30).

Moreover, as is also seen from the individual level estimates in Table 2, we see average contributions from group members in the public goods range between 932 TZS and 1113 TZS, although *t*-tests indicate that there are no significant differences between male-only, female only and mixed groups.[28]

4.2. Regression results

4.2.1. Ability to collaborate: problem-solving game

Table 4 shows the impact of gender composition on the ability to collaborate in groups. From the constant in regression 1, we see that mixed groups on average answered 7.5 out of ten multiple-choice questions correctly. We can also see that the coefficient on *SingleGender* is estimated to be nearly 0.9 and highly significant, meaning that female-only groups answered around 0.9 more questions correctly than mixed groups. We also observe that the interaction term *SingleGender*Male* is highly significant, indicating that male groups answered nearly 0.8 fewer questions correct than female groups. Furthermore, while we see that the coefficient on *SingleGender* + *SingleGender*Male* is positive, it is far from being significant, indicating that performance in mixed and male-only groups is identical.

In regression 2, having added the group's mean correct answer in the individual round, the same pattern occurs. In regression 3, we add the maximum number of correct answers that the group would have had in the individual round; that is, the number of correct scores that the group would have obtained had we counted one group member's correct answer as a correct answer for the whole group. This leaves the estimated impact of single-gender groups largely unchanged.[29]

Including a set of other group-level characteristics as explanatory variables in regression 4 reveals some interesting partial correlations, and we see that all else equal, the more altruistic the group members are, the better the group performs.[30] Similarly, the more experienced group members are at PRIDE—and at being in loan groups—the better the group performs. This suggests that experienced groups are more able to collaborate, although it is difficult to say whether this represents a learning effect or simply a selection effect (those who are able to collaborate and cooperate do not exit PRIDE). If anything, the coefficient on single-gender group becomes even larger in this regression.[31] We also note that the linear combination of *SingleGender* and *SingleGender*Male* is still not significant (*p*-value (*p*) = 0.22). This at least indicates that male groups do not perform any worse than mixed groups. The R^2 (=0.363) shows that the last model explains by far the most variation.[32]

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[27] According to several studies, the dictator game is highly sensitive to various conditions that may determine behavior (see, e.g., Andreoni and Bernheim (2009) and Andreoni et al. (2008) for an overview of altruism in experiments). Although we mainly use our measure of "altruism" as a control variable, one should interpret, in particular, contribution rates (as shown in Table 2) with care.

[28] In the experimental literature, several studies (see e.g. Buser et al., 2014) have recently correlated findings in the lab with behavior and outcomes from the real world. In the Appendix, Table A1, A2, we use our various lab-measures to predict participants loan size at the MFI. We do, however, find little evidence for robust correlations. One reason may be that we unfortunately only have data on loan size, and no measures of repayment problems or business performance.

[29] If, for instance, knowledge among group members in one type of group, e.g., among women, were much more varied at the individual level, one would also expect such groups to do better in the group round.

[30] In all regressions, the "altruism" measure is constructed to take the value of the dictator contribution to a "female PRIDE member" if the participant is a woman in a female group, and analogously for a male in a male group. For those in a mixed group, we use the average of the dictator contributions to males and females.

[31] It is possible that the group questions were simply easier for women. We therefore organized an additional "lab" in Dar es Salaam with 85 entrepreneurs and PRIDE clients (including 35 males), in which we asked the same questions, used identical incentives, and made the same amount of time available. However, this time, participants answered individually and not in groups. We found that women answered 7.24 questions correctly and that males answered only 0.017 more questions correctly: essentially identical averages. The *p*-value of 0.96 from a simple *t*-test of a gender difference indicates no inherent gender bias in the group questions.

[32] In the Appendix, Table A5, regression 1–2, we use the individual instead of the group as the unit of observation. We estimate similar regressions, but we now include a dummy for male. Our main results remains largely unchanged across these regressions. Furthermore, we investigate heterogeneous effects of being assigned to real-world single-gender or mixed groups based on participants' actual experiences with loan group composition. In the problem solving game (Table A5, regressions 3–4), there is some weak evidence that the impact for females of being assigned to female-only groups is larger for females with experience from female-only loan groups. However, the additional effect for these females is not significantly different from being zero, as seen from the non-significant coefficients on "SG group (lab)*SG loan group". Note, however, that one should be careful when interpreting the coefficients on "SG loan group", as microfinance clients partly self-selects into loan groups.

Table 4
Ability to collaborate in groups.

	(1)	(2)	(3)	(4)
	Problem solving	Problem solving	Problem solving	Problem solving
Single-gender group	0.899***	0.934***	0.914***	1.089***
	(0.261)	(0.264)	(0.265)	(0.263)
Single-gender group*male	−0.778***	−0.883***	−0.816***	−0.761**
	(0.262)	(0.260)	(0.259)	(0.286)
Group endowment knowledge		0.211		0.247
		(0.143)		(0.158)
Max group endowment knowledge			0.136	
			(0.106)	
Average altruism				0.195**
				(0.090)
Average education				−0.199
				(0.145)
Average loan size				0.055
				(0.082)
Average years with MFI				0.166**
				(0.075)
Average age				−0.029
				(0.019)
Number of members who can read				0.474
				(0.375)
Constant	7.545***	6.409***	6.320***	5.148***
	(0.184)	(0.816)	(1.009)	(1.580)
Single Gender Group+	0.121	0.051	0.099	0.328
Single-gender group*male	(0.261)	(0.246)	(0.256)	(0.261)
Observations	52	52	52	52
R^2	0.222	0.257	0.238	0.363

Note: This table presents OLS estimates. The dependent variable is the number of questions that a group was able to answer correctly (out of 10). The unit of observation is the group (consisting of four members). Single-gender group is a dummy variable that takes a value of one if a group is single gender, and zero otherwise. Single-gender group*male is an interaction term used to capture male groups. Group endowment knowledge is the total number of correct answers in the individual knowledge test given by all the members in the group. Max group endowment knowledge is the maximum number of correct answers that the group would have got from round 1, so that the group endowment from each sub-question is only dependent on at least one group member's knowing the answer. Average altruism is the average "relevant" contribution from the group members in the dictator game. Average education is the average number of years of education in the group. Average loan size is the average loan size of the four members in the group. Average years with MFI are the average number of years of membership of PRIDE for the four members of the group. Average age is the average age in the group. Number of members who can read is the number of members able to read. Single Gender Group + Single-gender group*male estimates the linear combination of these two variables, that is, the estimated difference in performance between mixed and all-male groups. Robust standard errors are in parentheses. *p < 0.10, ** p < 0.05, *** p < 0.01.

Table A3 in the Appendix shows how the role of the group's knowledge endowment varies with treatment and gender. To shed light on whether womens' knowledge is treated differently, we split the group's knowledge endowment into male and female knowledge endowments and interact this variable with single gender. Regressions 2 and 3 in Table A3 show that there is little partial correlation between the group's knowledge endowment and the group's outcome, and there is no evidence that womens' knowledge is less important than mens' knowledge in mixed groups. In addition, there is only a small correlation between the group's endowment and the outcome in both male and female groups.[33]

4.2.2. *Willingness to take risks in groups*

Table 5 shows how group composition affects willingness to take risks in groups. Similar to the group-knowledge game, we see from regression 1 that female-only groups take 24.7 percentage points more risk than mixed groups, while the additional effect for male groups is −17.2 percentage points, making the difference between all-male and mixed groups insignificant, as seen from the coefficient on *SingleGender + SingleGender*Male*. Adding the average individual risk measure in regression 2 makes the gender-interaction effect significant. This suggests that female groups differ significantly in terms of risk-taking not only from mixed groups but also from male groups. Adding the additional covariates in regression 6 reinforces this effect. We also note the strong relationship between individual risk choices and the choices that groups make, while no other explanatory variables are significant. In the Appendix, Table A6 (regression 1–2), as a robustness-check we also estimate a similar regression, but now using OLS (and not a Probit-model), and having the individual as the unit of observation. Coefficients on *SingleGender* remain largely unchanged and remains significant at the 10% level in both regression 1 and 2, but we note that the standard errors on *SingleGender*Male* increases and the coefficients are no longer

[33] Because other moments of the distribution may be important in explaining group outcomes, we performed several tests on the variances and ranges of our explanatory variables, which are reported in Tables A8 and A9 in the Appendix. In particular, all else variables equal, having at least one group member with a large loan correlates significantly with groups ability to collaborate (regression 3, Table A8).

Table 5
Willingness to take risks in groups.

	(1)	(2)	(3)
	Risky investment	Risky investment	Risky investment
Single-gender group	0.247*	0.204*	0.225**
	(0.127)	(0.108)	(0.113)
Single-gender group*male	−0.172	−0.234**	−0.353**
	(0.155)	(0.119)	(0.144)
Average individual risk		0.966***	1.192***
		(0.173)	(0.211)
Altruism			−0.071
			(0.048)
Average education			−0.036
			(0.068)
Average loan size			0.032
			(0.031)
Average years with MFI			0.012
			(0.040)
Average age			−0.005
			(0.012)
Number of members who can read			−0.088
			(0.176)
Single Gender Group +	0.075	−0.030	−0.128
Single-gender group*male	(0.162)	(0.129)	(0.143)
Observations	52	52	52
Pseudo log likelihood	−29.544	−20.473	−16.267

Note: This table provides the marginal effects based on probit-estimates. The dependent variable is a dummy variable taking a value of one if the group decided to take a risk, and zero otherwise. The unit of observation is the group (consisting of four members). Single-gender group is a dummy variable that takes a value of one if a group is single gender, and zero otherwise. Single-gender group*male is an interaction term used to capture male groups. Average individual risk is the average individual risk choice, where 1 indicates that all members chose the risky option. Average altruism is the average "relevant" contribution from the group members in the dictator game. Average education is the average number of years of education in the group. Average loan size is the average loan size of the four members in the group. Average years with MFI are the average number of years of membership of PRIDE for the four members of the group. Average age is the average age in the group. Number of members who can read is the number of members able to read. Single Gender Group + Single-gender group*male estimates the linear combination of these two variables, that is, the estimated difference in risk-taking between mixed and all-male groups. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

significant, indicating that the difference between male and female groups is less robust than the difference between mixed and female-only groups.[34]

To examine further the correlation between individual risk choices and group choices, we in Table A4 in the Appendix split each group's "individual risk" choice into one female risk variable and one male risk variable. Interestingly, regression 3 show that in mixed-gender groups, only males' individual risk decisions significantly predicts the groups choice (Although the difference between the male and female-risk are not significant). This may suggest that in mixed groups males have the final say more often than females.

4.2.3. Willingness to cooperate in groups: public-goods game

Table 6 shows the impact of group composition on groups' total public-good contributions. From regression 1,we see that the coefficient on *SingleGender* groups is close to 100, but insignificant. We also see, that similarly to the other group games, the coefficient on *SingleGender*Male* is negative, although not significant. Neither the difference between male and mixed group is significant (as seen from the coefficient at the bottom of the table).[35]

In regression 2, we add two potentially important controls from the lab: altruism (contributions in the dictator game) and average beliefs about other players' contributions. This causes the coefficient on single-gender group to increase to nearly 180 TZS, with the interaction term also being larger.

In regression 3, adding the standard set of group averages causes the coefficient on *SingleGender* to decrease. Moreover, we note that after controlling for the other variables, average education is negatively associated with public-goods contributions in the group, while reading ability is positively related to contributions. Adding more variables increases R^2 substantially, to 0.39.[36]

[34] We also look at heterogeneous impacts in table A6. However, we do not find any evidence that previous group-experience matter for the impact of group composition in the lab. Note that the probit-model is not identified when investigating these heterogeneous impacts, so we therefore use OLS instead.
[35] The maximum total observed contribution in a group is 7500 TZS, while the highest possible contribution is 8000 TZS.
[36] In the Appendix, Table A10, we estimate a model with log-transformed contributions, estimating (approximately) percentage changes. We observe that in one out of three regressions, the coefficient on *SingleGender* and *SingleGender*Male* becomes significant. However, we believe that this result is not robust enough to influence our sub-conclusion that gender composition does not affect contributions in the public-good game.

Table 6
Willingness to cooperate in groups.

	(1)	(2)	(3)
	Cooperation	Cooperation	Cooperation
Single-gender group	95.05	178.90	131.75
	(129.10)	(128.85)	(124.42)
Single-gender group*male	−180.54	−230.34	−105.08
	(137.23)	(152.34)	(129.65)
Altruism		70.06	92.99**
		(46.76)	(40.34)
Average beliefs		111.03	122.69
		(69.53)	(74.98)
Average education			−189.25***
			(49.73)
Average loan size			−8.22
			(34.63)
Average years with MFI			26.21
			(29.72)
Average age			14.61
			(15.16)
Number of members who can read			438.52***
			(158.11)
Constant	1018.18***	297.41	−788.71
	(102.55)	(296.44)	(882.63)
Single Gender Group +	−85.49	−51.44	26.67
Single-gender group*male	(152.30)	(146.88)	(114.17)
Observations	52	52	52
R^2	0.028	0.137	0.391

Notes: This table presents OLS estimates. The dependent variable is the average of group member contributions to the public fund in the public-good game. The unit of observation is the group (consisting of four members). Single-gender group is a dummy variable that takes a value of one if a group is single gender, and zero otherwise. Single-gender group*male is an interaction term used to capture male groups. Average beliefs are the group members' average beliefs about what other group members will contribute. Average altruism is the average "relevant" contribution from the group members in the dictator game. Average education is the average number of years of education in the group. Average loan size is the average loan size of the four members in the group. Average years with MFI are the average number of years of membership of PRIDE for the four members of the group. Average age is the average age in the group. Number of members who can read is the number of members able to read. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

In the Appendix, Table A7, we estimate regressions using the individual as the unit of observation, and we observe very similar patterns. We note in particular that females do not contribute more when being assigned to female-only groups (as seen from the non-significant coefficient on "single-gender group (lab)").[37]

5. Discussion

We have explored how gender composition of groups may influence three important dimensions of loan group dynamics; namely the groups' ability to collaborate and solve a common challenge, the willingness to take risks as a group, and the willingness to cooperate and contribute to resolving a social dilemma.

Our main finding is that group composition matters significantly for groups' ability to collaborate, as all-women groups outperform both mixed and all-men groups in the problem-solving game, even though women perform no better than men at the individual level.

One potential mechanism could lie in gender-specific social identities. Akerlof and Kranton (2000) incorporated social identity into standard economic models, and defined social identity as "a person's sense of self", and argued that such perceptions affect economic behavior.[38] For instance, women may act according to particular perceptions of what it means to "be a woman" even though such behavior may not necessarily be in their own self-interest. To illustrate, such common perceptions may lead women to be less outspoken and more quiet when being observed by men.[39]

Arguably, placing current female PRIDE members and entrepreneurs in face-to-face groups may result in what Croson et al. (2008) describe as a setting with "high social identity." Their main findings are that efficiency and coordination improve among women with a high social identity, and that efficiency and coordination decline substantially among men sharing the same high social identity. Whereas women in female groups may act based on the female self (e.g., by being collaborative

[37] In Table A7, we also investigate heterogenous impacts based on individuals previous experience with single-gender loan groups. However, we do not find any evidence of heterogenous impacts.

[38] There is a growing literature on experimental studies of group membership and group identity, such as Eckel and Grossman (2005), Goette et al. (2006), Charness et al. (2007), Chen and Li (2009) and Chen and Chen (2011), using various forms of manipulations and outcomes, documenting that group identity can shape behavior.

[39] This could for instance explain why Booth and Nolen (2012b) found that girls compete more like boys when being with other girls.

and prioritizing group needs), men with the same sense of identity – entrepreneurs and PRIDE members – may compete for dominance within their group. This may have detrimental effects when men face a common challenge. In particular, if the identity of "being a man" is associated with not showing weakness, not openly admitting that one does not know an answer or openly criticizing a man of higher rank, may be problematic when there is a strong shared identity. These effects may be particularly important in societies with traditional gender norms, such as in Tanzania.[40]

Taken together, if knowledgeable females do not speak up, while men "compete for dominance" (Tiger, 1984), mixed and all-male groups will not perform particularly well, while women-only groups will be more able to collaborate and solve common challenges.

Unfortunately, our experimental design does not allow us to pinpoint precisely why our female groups perform better in the problem-solving exercise. We can therefore neither conclude nor rule out other possible complementary explanations interacting with gender and group composition, such as room effects (Castillo et al., 2015), audience effects and signaling (Bohnet and Frey, 1999; Charness and Rustichini 2011; Andreoni and Bernheim 2009).[41]

We also found evidence of women-only groups taking more risk than mixed groups, and to some extent we also found that women-only groups take more risk than male-only groups. These results are in line with Booth and Nolen (2012a), who found that young girls behaved less risk-aversely in a lottery task when assigned to groups of girls. On the other hand, they contrast Castillo et al. (2015), who found that the higher share of men in the room, the more risk women took. While these two studies have some similarities, they both differ from the present study in important dimensions. In particular, the participants in our study made joint risk decisions face-to-face in groups, while decision-making in the two other studies were made at the individual level. Moreover, while Castillo et al. (2015) used standard student samples and Booth and Nolen (2012a) used young school pupils, our sample consisted of small-scale entrepreneurs being members of loan groups.

What may explain that women-only groups take more risks than male-only and mixed groups? One mechanism could be related to our findings in the problem-solving game, and may simply be that group dynamics in general are more well functioning in women-only groups. More positive dynamics in female groups may facilitate all group members' having a say, and female groups may therefore be better able to make decisions that are more consistent with their individual pReferences

However, our exploratory analysis in Table A4 in the Appendix only lends some support to such a mechanism, as individual risk choices strongly predicts the groups choice in both male-only and female-only groups (columns 4 and 5). Though, when looking at mixed groups (column 3), we see that males' individual risk choices significantly predict the group's choice, while individual choices of female group members in mixed groups do not significantly predict the group's choice)(however, the difference between these two coefficients are not significant).[42] If we assume that the correlation between actual choices in the individual round and the preferred choices in the group round is positive, and that this correlation is similar for males and females, these findings may indicate that women are more often ignored or tend to not speak up in a mixed-gender settings involving risk-decisions.[43]

The general experimental literature on gender may also provide some further guidance on why female groups perform differently in both the problem-solving game and the risk game. In particular, Eckel and Grossman (2008) find that women tend to be more egalitarian and more likely to reach agreements in negotiations; such traits are likely to be important when collaborating in making joint decisions where there is scope for disagreement among group members.[44]

A recent study by Babcock et al. (2015) also found some interesting gender differences that may lead to very different group dynamics. When examining environments where a volunteer must be found for a task that everyone prefers to be completed by someone else, they found that women more frequently volunteer, are more frequently asked to volunteer, and more frequently accept requests to volunteer. Interestingly, while we find that female-only groups are more able to collaborate than male-only groups and mixed groups, Kuhn and Villeval (2015) also document that women are in fact more attracted by co-operative incentives than males, and this is partly explained by the women in their study making more optimistic assessments of their prospective team members' ability. Even though the study by Kuhn and Villeval (2015) was conducted in a more standard-lab setting than ours with no face-to-face communication, making more optimistic

[40] A few weeks after the lab sessions, we held focus group discussions with lab participants in which we discussed gender composition and group dynamics. Interestingly, the men themselves were aware of their lack of cooperative abilities: *"There is a Kiswahili proverb: 'Two bulls do not stay in one house.' When you put men together there is always a tendency for them to disagree with each other, while women on the other hand would listen to each other."* Another male participant claimed: "w*henever men and women are mixed in a group, women tend to step aside, assuming that men are supposed to lead, even when the man is inexperienced in the relevant subject."*

[41] In an exploratory analysis reported in Table A1, we do not find any evidence that females' knowledge is treated differently than males' knowledge in mixed groups; that is, females' individual-based knowledge is not less correlated with the groups' score than that of males' individual score (columns 2 and 3). Even though these are merely correlations, and not particularly strong, we at least notice that when looking at only female groups, the correlation between groups' individual knowledge and group score is even negative.

[42] Masclet et al. (2009), looking at risk choices both individually and when groups decide via voting, find that groups are more likely than individuals to choose safe lotteries. Similarly, Ertac and Gurdal (2012) find that when individuals decide on behalf of a group, the amount of risk taken is lower than when making risky choices influencing one self only.

[43] During the lab sessions, our research assistants kept communication records on each participant, noting, e.g., whether participants were talkative or put forward an opinion. Although such data should be interpreted carefully, they suggest that women in women groups were more talkative than women in mixed groups ($p = 0.048$). Furthermore, our records also indicate that men in male groups were less likely to advance an opinion, compared with men in mixed groups.

[44] Although we do not have a good measure of egalitarism, we note that females does not share significantly more than males in the dictator game ($p = 0.4$)

and positive assessments of group-members would probably be good for group dynamics when trying to find solutions to common challenges, such as in the problem-solving game.

While group composition mattered for our problem-solving task and our risk-game, we did not find any robust evidence that willingness to cooperate and contribute in a public-goods dilemma was influenced by gender composition. One explanation could be that this game was played anonymously, and not face-to face as the other games, making the institutional framework very different. However, the zero finding does at least suggest that women-only groups' superior performance in the problem solving-game was not caused by a greater willingness to cooperate with other women than with men. It is also in line with previous research, which suggests that gender and gender composition do not matter systematically for public goods contributions (Eckel and Grossman, 2008).

6. Conclusion

Our research question was motivated by studies showing that female-dominated loan groups more frequently repay their debt, and our findings may shed some light on this phenomenon. Women-only groups' superior performance in the problem-solving game may indicate that female loan groups are simply more able to collaborate, while the public-good game may indicate that the higher repayment rates are probably not caused by a greater willingness as such to cooperate and repay loans. Moreover, our risk game does not indicate that women-only groups seek less risk, which also could have explained high repayment rates.

On a more suggestive note, our findings may also shed light on why women seem to be more attracted to joining MFIs, thereby making up the majority of most microfinance institutions: if women manage to collaborate well and can handle joint liability schemes in a constructive way, they will benefit more from joining an MFI than what males would do.[45]

Our study has three important limitations that should make one careful in generalizing the findings and that may contribute to explain why our results to some extent deviate from previous results. First, given our group-composition treatment design, it is difficult to pinpoint exactly the mechanisms explaining why women-only groups are more able to collaborate and take more risk than men-only and mixed groups. Secondly, it is challenging to compare the problem-solving game and the risk game with the public-goods game, as the first two were played in a face-to-face environment with groups making joint decisions, while the latter was conducted anonymously. Finally, in order to shed light on loan group dynamics, our study was conducted among microfinance clients being small-scale entrepreneurs, which makes it difficult to generalize results to the general, non-entrepreneurial population. We urge future research to address these concerns and to study more closely the relationship between group behavior in the lab and group behavior in the real world.

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Appendix A

[45] Women dominance in microfinance could also be due to "supply" factors, i.e. that the microfinance institutions to a larger extent welcomes women, and more often avoid giving loans to men. However, the same "demand" factors (e.g. women being better collaborators) could also explain this.

Table A1
Connecting the lab to the field: Predicting loan size from collaboration and risk games.

	(1)	(2)	(3)	(4)	(5)	(6)
	Loan size (Full Sample)	Loan size (Full Sample)	Loan size (Female Sample)	Loan size (Female Sample)	Loan size (Male Sample)	Loan size (Male Sample)
Group knowledge	3.826	−26.011	24.066	−32.539	−26.943	−25.313
	(24.419)	(40.426)	(27.249)	(36.849)	(43.777)	(59.595)
Individual knowledge	8.692	9.790	1.161	5.337	16.550	16.273
	(8.837)	(9.241)	(13.005)	(14.013)	(13.836)	(13.768)
Group risk	48.962	103.624	79.298	123.831	12.380	106.424
	(46.496)	(95.695)	(58.361)	(161.916)	(74.138)	(150.340)
Individual risk	−0.518	1.782	42.596	44.206	−61.610	−62.694
	(38.106)	(39.031)	(46.217)	(44.164)	(62.650)	(65.990)
Single-gender group (lab)		−543.364		−1010.895**		−20.572
		(410.433)		(457.989)		(681.210)
Group knowledge*SG (lab)		66.900		121.126**		2.664
		(53.717)		(56.967)		(90.668)
Group risk*SG (lab)		−72.123		−32.903		−155.901
		(109.474)		(172.017)		(154.671)
Constant	183.720	410.531	10.161	432.402	432.075	421.743
	(196.898)	(285.488)	(233.048)	(297.793)	(319.785)	(409.002)
Group knowledge + group knowledge*SG		40.889		88.587**		−22.649
		(34.169)		(40.710)		(68.324)
Group risk + group risk*SG		31.501		90.928		−49.477
		(49.713)		(58.019)		(55.529)
Observations	206	206	115	115	91	91
R^2	0.009	0.027	0.045	0.088	0.021	0.037

Note: This table presents OLS estimates. The dependent variable is loan size at PRIDE in thousands of TZS. The unit of observation is the individual. Group knowledge is the number of correct answers that the individual's group got. Individual knowledge is the total number of correct answers in the individual knowledge test. Group risk is the risk choice made by the individual's group. Individual risk is the individual risk choice. Single-gender group is a dummy variable that takes a value of one if the group was single gender, and zero otherwise. Group knowledge*SG is the interaction between the group's number of correct answers and the dummy variable for single-gender group (in the lab). Group risk*SG is an interaction between the group's risk choice and the dummy variable for single-gender group (in the lab). Sum group knowledge*SG is the linear combination of group knowledge and single-gender group. Sum group risk*SG is the linear combination of group risk and single-gender group. Because two observations on loan size are missing, N = 206. Cluster standard errors are in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

Table A2
Connecting the lab to the field: Predicting loan size from the public-good game.

	(1)	(2)	(3)	(4)	(5)	(6)
	Loan size (Full Sample)	Loan size (Full Sample)	Loan size (Female Sample)	Loan size (Female Sample)	Loan size (Male Sample)	Loan size (Male Sample)
Public-good contribution (PG)	14.106	−4.826	−10.555	−24.922	35.848	8.349
	(24.831)	(38.804)	(37.551)	(58.119)	(36.245)	(57.201)
Beliefs	9.894	9.705	10.074	10.818	11.130	11.153
	(8.883)	(8.999)	(9.794)	(9.714)	(18.324)	(18.571)
Altruism vs. male	35.415	37.377	74.211	77.182	41.004	44.120
	(100.814)	(100.904)	(132.575)	(132.958)	(189.295)	(194.174)
Altruism vs. female	−56.608	−60.393	53.724	56.657	−185.334	−191.035
	(109.162)	(109.371)	(124.964)	(128.848)	(200.947)	(207.963)
Public-good contribution*SG (lab)		34.616		23.775		49.460
		(48.739)		(69.963)		(75.407)
Single-gender group (lab)		−67.376		−19.693		−104.268
		(69.083)		(114.175)		(84.795)
Constant	255.998***	295.250***	196.713**	203.363*	304.695***	362.817***
	(71.207)	(88.242)	(81.251)	(107.869)	(101.981)	(115.027)
Sum public-good contribution + PG*SG		29.790		−1.147		57.809
		(30.591)		(45.430)		(48.064)
Observations	202	202	108	108	94	94
R^2	0.008	0.013	0.012	0.014	0.027	0.041

Note: This table presents OLS estimates. The dependent variable is loan size at PRIDE in thousands of TZS. The unit of observation is the individual. Public-good contribution is the individual's contribution in the public-good game, in thousands of TZS. Belief is the individual's average of beliefs over what the other three group members would contribute in the public-good game. Altruism vs. male/female is the individual's contribution in the dictator game to a male/female. Single-gender group is a dummy variable that takes the value of one if the group was single gender, and zero otherwise. Public-good contribution*SG is the interaction between public-good contributions and single-gender group. Sum public-good contribution + PG*SG is the linear combination of public-good contribution and public-good contribution*SG. Because six observations on loan size are missing, N = 202. Cluster standard errors are in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

Table A3
Ability to collaborate in groups.

	(1)	(2)	(3)	(4)	(5)
	Problem solving (Original estimates)	Problem solving	Problem solving Mixed groups	Problem solving Female groups	Problem solving Male groups
Single-gender group	0.899***	3.032			
	(0.261)	(2.034)			
Single-gender group*male	−0.778***	−2.250			
	(0.262)	(1.745)			
Male knowledge (sum)		0.071	0.071		0.060
		(0.072)	(0.072)		(0.050)
Female knowledge (sum)		0.121	0.121	−0.005	
		(0.102)	(0.102)	(0.060)	
Single-gender group*male knowledge		−0.012			
		(0.087)			
Single-gender group*female knowledge		−0.126			
		(0.118)			
Constant	7.545***	5.525***	5.525***	8.558***	6.308***
	(0.184)	(1.521)	(1.522)	(1.333)	(1.125)
Observations	52	52	22	18	12
R^2	0.222	0.276	0.096	0.000	0.132

Note: This table presents OLS estimates. The dependent variable is the number of questions a group was able to correctly answer (out of 10). The unit of observation is the group (consisting of four members). Single-gender group is a dummy variable that takes a value of one if a group is single gender, and zero otherwise. Single-gender group*male is an interaction term used to capture male groups. Male knowledge is the total number of correct answers in the individual knowledge test given by all male members in the group. Female knowledge is the total number of correct answers in the individual knowledge test given by all female members in the group. Single-gender group*male knowledge is the interaction of these two variables. Single-gender group*female knowledge is the interaction of these two variables. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A4
Willingness to take risks in groups.

	(1)	(2)	(3)	(4)	(5)
	Risky investment	Risky investment	Risky investment	Risky investment	Risky investment
	(Orig. Est.)		Mixed Groups	Female Groups	Male Groups
Single-gender group	0.204*	0.448			
	(0.108)	(0.324)			
Single-gender group*male	−0.234**	−2.947***			
	(0.119)	(0.639)			
Average individual risk	0.966***				
	(0.173)				
Male average individual risk		0.745***	0.513***		0.894**
		(0.233)	(0.125)		(0.341)
Female average individual risk		0.336	0.231	1.054***	
		(0.274)	(0.194)	(0.346)	
Single-gender group *male average individual risk		3.647***			
		(0.649)			
Single-gender group *female average individual risk		0.355			
		(0.421)			
Observations	52	52	22	18	12
Pseudo log likelihood	−20.473	−19.049	−5.814	−9.870	(0.348)

Note: This table provides the marginal effects based on the probit-estimates. The dependent variable is a dummy variable taking a value of one if the group decided to take a risk, and zero otherwise. The unit of observation is the group (consisting of four members). Single-gender group is a dummy variable that takes a value of one if a group is single gender, and zero otherwise. Single-gender group*male is an interaction term used to capture male groups. Average individual risk is the average individual risk choice of all group members, where 1 indicates that all members chose the risky option. Female average individual risk is the average individual risk choice of all female group members, where 1 indicates that all female members chose the risky option. Male average individual risk is the average individual risk choice of all male group members, where 1 indicates that all male members chose the risky option. Single-gender group*male average individual risk is the interaction of these two variables. Single-gender group*female average individual risk is the interaction of these two variables. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A5
Ability to collaborate in groups: Individual and heterogeneous effects.

	(1)	(2)	(3)	(4)
	Problem solving	Problem solving	Problem solving	Problem solving
Single-gender group (lab)	0.888***	0.901***	0.726**	0.745***
	(0.257)	(0.254)	(0.273)	(0.266)
SG group (lab)*SG loan group			0.300	0.299
			(0.259)	(0.265)
SG loan group			−0.418**	−0.441**
			(0.180)	(0.186)
SG group (lab)*male	−0.763***	−0.753***	−0.587*	−0.584*
	(0.260)	(0.266)	(0.304)	(0.311)
Male	−0.038	−0.032	−0.286**	−0.287**
	(0.029)	(0.032)	(0.137)	(0.140)
SG group (lab)*SG loan group*male			−0.431	−0.427
			(0.537)	(0.529)
SG loan group*male			0.536	0.518
			(0.406)	(0.382)
Knowledge (individual)	0.045	0.046	0.042	0.042
	(0.031)	(0.033)	(0.031)	(0.034)
Education		−0.023		−0.025
		(0.029)		(0.030)
Altruism		0.000		0.000
		(0.000)		(0.000)
Read		0.143		0.114
		(0.306)		(0.310)
Risk (individual)		0.031		0.039
		(0.119)		(0.119)
Constant	7.323***	7.174***	7.577***	7.460***
	(0.260)	(0.340)	(0.255)	(0.347)
Single-gender group + SG group*male	0.125	0.148	0.139	0.161
	(0.255)	(0.249)	(0.268)	(.265)
Single-gender group + SG group*SG loan group			1.026***	1.043***
			(0.288)	(0.288)
SG group + SG group*male + SG group*SG loan group (males in male loan groups)			0.008 (0.444)	0.33 (0.414)
Observations	208	208	208	208
R^2	0.230	0.238	0.244	0.254

Note: This table presents OLS estimates. The dependent variable is the number of questions that a group was able to answer correctly (out of 10). The unit of observation is the individual. SG group (Single-gender group) is a dummy variable that takes a value of one if a group was single gender, and zero otherwise. SG group*SG loan group is an interaction term between SG group and SG loan group. SG loan group is a dummy for whether the participant was a member of a single-gender loan group at PRIDE. SG group*male is an interaction variable between SG group and male. Male is a dummy indicating whether the participant is male. SG group*SG loan group*male is an interaction variable between SG group, SG loan group and male. SG loan group*male is an interaction variable between SG loan group and male. Knowledge is the total number of correct answers in the individual knowledge test. Education is years of education. Altruism is the "relevant" contribution to his group member in the dictator game. Read is a dummy indicating whether the participant can read. Risk is a dummy indicating whether the participant chose the risky option in the individual risk game. Cluster robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A6
Willingness to take risks in groups: Individual and heterogeneous effects.

	(1)	(2)	(3)	(4)
	Risky investment	Risky investment	Risky investment	Risky investment
SG group (lab)	0.245*	0.252*	0.223	0.231
	(0.141)	(0.134)	(0.181)	(0.170)
SG group (lab)*SG loan group			0.042	0.045
			(0.170)	(0.149)
SG loan group			−0.065	−0.088
			(0.128)	(0.112)
SG group (lab)*male	−0.198	−0.224	−0.153	−0.188
	(0.165)	(0.165)	(0.204)	(0.199)
Male	0.000	0.032	−0.041	−0.012
	(0.026)	(0.033)	(0.079)	(0.075)
SG group (lab)*SG loan group*male			−0.376	−0.292
			(0.286)	(0.285)
SG loan group*male			0.100	0.052
			(0.215)	(0.217)

Table A6 (*Continued*)

	(1)	(2)	(3)	(4)
	Risky investment	Risky investment	Risky investment	Risky investment
Knowledge (individual)		−0.032*		−0.033*
		(0.017)		(0.017)
Education		−0.020		−0.021
		(0.017)		(0.017)
Altruism		−0.000		−0.000
		(0.000)		(0.000)
Read		−0.055		−0.058
		(0.228)		(0.237)
Risk (individual)	0.239***	0.254***	0.242***	0.258***
	(0.063)	(0.065)	(0.064)	(0.066)
Constant	0.073	0.456*	0.109	0.510*
	(0.072)	(0.257)	(0.096)	(0.272)
Single-gender group + SG group*male	0.047	0.028	0.070	0.042
	(0.139)	(0.141)	(0.146)	(0.152)
Single-gender group + SG group*SG loan group			0.265*	0.276*
			(0.154)	(0.141)
SG group + SG group*male + SG group*SG loan group (males in male loan groups)			−0.265 (0.176)	−0.197 (0.181)
Observations	208	208	208	208
R^2	0.230	0.238	0.244	0.254

Note: This table presents OLS estimates. The dependent variable is a dummy variable taking a value of one if the group decided to take a risk, and zero otherwise. The unit of observation is the individual. SG group (Single-gender group) is a dummy variable that takes a value of one if the group was single gender, and zero otherwise. SG group*SG loan group is an interaction term between SG group and SG loan group. SG loan group is a dummy for whether the participant was a member of a single-gender loan group at PRIDE. SG group*male is an interaction variable between SG group and male. Male is a dummy indicating whether the participant is male. SG group*SG loan group*male is an interaction variable between SG group, SG loan group, and male. SG loan group*male is an interaction variable between SG loan group and male. Knowledge is the total number of correct answers in the individual knowledge test. Education is years of education. Altruism is a member's "relevant" contribution to the group in the dictator game. Read is a dummy indicating whether the participant can read. Risk is a dummy indicating whether the participant chose the risky option in the individual risk game. Cluster robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A7
Willingness to cooperate in groups: Individual and heterogeneous effects.

	(1)	(2)	(3)	(4)
	Cooperation	Cooperation	Cooperation	Cooperation
Single-gender group (lab)	100.955	90.548	71.079	58.633
	(146.333)	(147.094)	(241.354)	(239.510)
SG group (lab)*SG loan group			41.259	46.570
			(306.128)	(305.922)
SG loan group			222.139	224.790
			(239.807)	(237.413)
SG group (lab)*male	−98.099	−60.430	−36.955	9.449
	(226.391)	(226.816)	(303.816)	(302.972)
Male	−121.193	−132.132	48.359	34.395
	(169.266)	(167.610)	(228.911)	(221.419)
SG group (lab)*SG loan group*male			8.688	−94.614
			(515.276)	(543.935)
SG loan group*male			−787.380**	−698.499*
			(336.695)	(373.426)
Knowledge (individual)		8.248		5.976
		(34.941)		(35.600)
Education		−71.839**		−70.930**
		(31.404)		(31.725)
Altruism	0.598**	0.642**	0.601**	0.639**
	(0.248)	(0.248)	(0.244)	(0.246)
Read		562.121**		538.434**
		(246.236)		(249.848)
Risk (Individual)		3.352		2.161
		(110.996)		(110.773)
Average beliefs	0.243***	0.253***	0.250***	0.263***
	(0.082)	(0.086)	(0.082)	(0.085)
Constant	513.353***	410.172	371.681*	294.417
	(182.442)	(285.038)	(218.146)	(322.584)
Single-gender group + SG group*male	2.856	30.118	34.124	68.083
	(172.755)	(171.920)	(184.033)	(182.873)

Table A7 (*Continued*)

	(1)	(2)	(3)	(4)
	Cooperation	Cooperation	Cooperation	Cooperation
Single-gender group + SG group*SG loan group			112.338	105.203
			(184.150)	(186.183)
SG group + SG group*male + SG group*SG loan group (males in male loan groups)			84.071	20.039
			(368.302)	(410.752)
Observations	208	208	208	208
R^2	0.071	0.095	0.101	0.124

Note: This table presents OLS estimates. The dependent variable is public-good contribution. The unit of observation is the individual. SG group (Single-gender group) is a dummy variable that takes a value of one if the group was single gender, and zero otherwise. SG group*SG loan group is an interaction term between SG group and SG loan group. SG loan group is a dummy for whether the participant was member of a single-gender loan group at PRIDE. SG group*male is an interaction variable between SG group and male. Male is a dummy indicating whether the participant is male. SG group*SG loan group*male is an interaction variable between SG group, SG loan group and male. SG loan group*male is an interaction variable between SG loan group and male. Knowledge is the total number of correct answers in the individual knowledge test. Education is years of education. Altruism is the "relevant" contribution to his group member in the dictator game. Read is a dummy indicating whether the participant can read. Risk is a dummy indicating whether the participant chose the risky option in the individual risk game. Average beliefs is the group's average beliefs about its members' contributions. Cluster robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A8
Ability to collaborate in groups.

	(1)	(2)	(3)
	Problem solving	Problem solving	Problem solving
Single-gender group	1.089***	0.944***	0.854***
	(0.263)	(0.296)	(0.248)
Single-gender group*male	−0.761**	−0.792***	−0.921***
	(0.286)	(0.287)	(0.299)
Altruism	0.195**	0.178*	0.209
	(0.090)	(0.105)	(0.126)
Average education	−0.199	−0.176	−0.075
	(0.145)	(0.155)	(0.137)
Average loan size	0.055	0.009	−0.141
	(0.082)	(0.125)	(0.106)
Average years with MFI	0.166**	−0.057	0.137
	(0.075)	(0.144)	(0.092)
Average age	−0.029	−0.022	0.004
	(0.019)	(0.026)	(0.026)
Number of literate members	0.474	0.396	0.501
	(0.375)	(0.370)	(0.366)
Variance of knowledge		−0.041	
		(0.074)	
Variance of loan		0.066	
		(0.063)	
Variance of altruism		−0.001	
		(0.000)	
Variance of age		−0.018	
		(0.014)	
Variance of years with MFI		0.099	
		(0.063)	
High max knowledge			−0.280
			(0.340)
High max loan			0.952**
			(0.364)
High max altruism			−0.468
			(0.402)
High max age			−0.312
			(0.309)
High max years with MFI			−0.219
			(0.341)
Constant	5.148***	5.722***	3.658*
	(1.580)	(1.665)	(1.979)
Single Gender Group +	0.33	0.15	−0.07

Table A8 (*Continued*)

	(1)	(2)	(3)
	Problem solving	Problem solving	Problem solving
Single-gender group*male	(0.26)	(0.29)	(0.32)
Observations	52	52	52
R^2	0.363	0.466	0.497

Note: This table presents OLS estimates. The dependent variable is the number of questions a group was able to answer correctly (out of 10). The unit of observation is the group (consisting of four members). Single-gender group is a dummy variable that takes a value of one if a group is single gender, and zero otherwise. Single-gender group*male is an interaction term used to capture male groups. Total knowledge endowment is the total number of correct answers in the individual knowledge test given by all the members in the group. Average loan size is the average loan size of the four members in the group. Average years with MFI is the average number of years of membership of PRIDE for the four members of the group. Number of literate members is the number of members able to read. Altruism is the average "relevant" contribution from the group members in the dictator game. "Variance" variables are defined in the following way: Within in the group, we take the highest individual value observed, and deduct from it the lowest value observed. High variables are defined as follows. Knowledge: equals one if at least one group member got eight or more questions correct in the individual knowledge round. Loan: equals one if at least one group member had a loan of 800,000 TZS or more. Altruism: equals one if at least one group member contributed 700 TZS or more. Age: equals one if at least one member is older than 45 years. Years with MFI: equals one if at least one member had been with PRIDE for more than eight years. Single Gender Group + Single-gender group*male estimates the linear combination of these two variables, that is, the estimated difference in performance between mixed and all-male groups Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A9
Risky investment.

	(4)	(5)	(6)
	Risky investment	Risky investment	Risky investment
Single-gender group	0.225**	0.158	0.140
	(0.113)	(0.121)	(0.118)
Single-gender group*male	−0.353**	−0.321***	−0.432**
	(0.144)	(0.115)	(0.169)
Altruism	−0.071	−0.079*	−0.150**
	(0.048)	(0.042)	(0.074)
Average education	−0.036	−0.044	−0.005
	(0.068)	(0.060)	(0.062)
Average loan size	0.032	0.024	0.009
	(0.031)	(0.046)	(0.053)
Average years with MFI	0.012	−0.028	−0.015
	(0.040)	(0.056)	(0.040)
Average age	−0.005	−0.005	−0.014
	(0.012)	(0.011)	(0.015)
Number of literate members	−0.088	−0.081	−0.229
	(0.176)	(0.149)	(0.169)
Variance of knowledge		−0.042	
		(0.030)	
Variance of loan		0.015	
		(0.026)	
Variance of altruism		−0.000	
		(0.000)	
Variance of age		0.002	
		(0.006)	
Variance of years with MFI		0.021	
		(0.025)	
High risk			0.179
			(0.204)
High max knowledge			−0.181**
			(0.092)
High max loan			0.032
			(0.176)
High max altruism			0.052
			(0.123)
High max age			0.190
			(0.121)
High max years with MFI			0.020
			(0.138)
Single Gender Group +	−0.13	−0.16	−0.29
Single-gender group*male	(0.14)	(0.13)	(0.15)
Observations	52	52	52
Pseudo log likelihood	−16.267	−15.163	−14.216

Note: This table provides the marginal effects based on the probit estimates. The dependent variable is a dummy variable taking a value of one if the group decided to take a risk, and zero otherwise. The unit of observation is the group (consisting of four members). Single-gender group is a dummy variable that takes a value of one if a group is single gender, and zero otherwise. Single-gender group*male is an interaction term used to capture male groups. Average individual risk is the average individual risk choice. Average loan size is the average loan size of the four members in the group. Average years with MFI is the average number of years of membership of PRIDE for the four members of the group. Number of literate members is the number of members able to read. Altruism is the average "relevant" contribution from the group members in the dictator game. "Variance" variables are defined as follows: For within-group variation, we take the highest individual value observed and deduct from it the lowest value observed. High variables are defined as follows. Knowledge: equals one if at least one group member got eight or more questions correct in the individual knowledge round. Loan: equals one if at least one group member had a loan of 800,000 TZS or more. Altruism: equals one if at least one group member contributed 700 TZS or more. Age: equals one if at least one member is older than 45 years. Years with MFI: equals one if at least one member had been with PRIDE for more than eight years. Single Gender Group + Single-gender group*male estimates the combination of these two variables, that is, the estimated difference in performance between mixed and all-male groups Robust standard errors are in parentheses. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A10
Willingness to cooperate in groups – log of contributions.

	(1)	(2)	(3)
	Cooperation	Cooperation	Cooperation
Single-gender group	0.17	0.27*	0.22
	(0.14)	(0.15)	(0.13)
Single-gender group*male	−0.23	−0.28*	−0.13
	(0.15)	(0.16)	(0.13)
Altruism		0.09*	0.12***
		(0.05)	(0.04)
Average beliefs		0.12	0.13
		(0.07)	(0.08)
Average education			−0.23***
			(0.06)
Average loan size			−0.02
			(0.04)
Average years with MFI			0.04
			(0.03)
Average age			0.01
			(0.01)
Number of literate members			0.51***
			(0.17)
Constant	6.80***	5.95***	4.98***
	(0.12)	(0.37)	(0.86)
Single Gender Group +	−0.06	−0.013	0.09
Single-gender group*male	(0.17)	(0.16)	(0.13)
Observations	52.	52	52
R^2	0.04	0.17	0.44

Notes: This table presents OLS estimates. The dependent variable is the log of average of group member contributions to the public fund in the public-good game. The unit of observation is the group (consisting of four members). Single-gender group is a dummy variable that takes a value of one if a group is single gender, and zero otherwise. Single-gender group*male is an interaction term used to capture male groups. Altruism measures the "relevant" average contribution from the group members in the dictator game. Average beliefs are the group members' average beliefs about what other group members will contribute. Average loan size measures the average loan size of the four members in the group. Average years with MFI are the average number of years of membership in PRIDE for the four members of the group. Number of literate members is the number of members able to read. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Appendix B. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.jebo.2016.07.015.

References

Ahern, K.R., Dittmar, A.K., 2012. The changing of the boards: the impact on firm valuation of mandated female board representation. Q. J. Econ. 127, 137–197.
Akerlof, G., Kranton, R., 2000. Economics and identity. Q. J. Econ. 115, 715–753.
Andreoni, J., Bernheim, B.D., 2009. Social image and the 50-50 norm: a theoretical and experimental analysis of audience effects. Econometrica 77, 1607–1636.
Andreoni, J., Harbaugh W.T., Vesterlund L., 2008. Altruism in Experiments. In The New Palgrave Dictionary of Economics, 2nd ed.
Anthony, D., Horne, C., 2003. Gender and cooperation: explaining loan repayment in micro-credit groups. Soc. Psychol. Q. 66, 293–302.
Apesteguia, J., Azmat, G., Iriberri, N., 2012. The impact of gender composition on team performance and decision-making: evidence from the field. Manage. Sci. 58, 78–93.
Armendáriz de Aghion, B., Murdoch, J., 2010. The Economics of Microfinance, 2nd ed. MIT Press, Cambridge.
Babcock, L., Weingart, L., Vesterlund, L., 2015. Breaking the Glass Ceiling with "No": Gender Differences in Accepting and Receiving Requests for Non-Promotable Tasks, Mimeo. University of Pittsburgh.
Banerjee, A., Karlan, D., Zinman, J., 2015. Six randomized evaluations of microcredit: introduction and further steps. Am. Econ. J. Appl. Econ. 7, 1–21.
Berge, L.I.O., Bjorvatn, K., Tungodden, B., 2015. Human and financial capital for microenterprise development: evidence from a field and lab experiment. Manage. Sci. 61, 707–722.
Bochet, O., Page, T., Putterman, L., 2006. Communication and punishment in voluntary contribution experiments. J. Econ. Behav. Org. 60 (1), 11–26.
Bohnet, I., Frey, B., 1999. Social distance and other-Regarding behavior in dictator games: comment. Am. Econ. Rev. 89, 335–339.
Booth, A., Nolen, P., 2012a. Gender differences in risk behaviour: does nurture matter? Econ. J. 122 (558), F56–F78.
Booth, A., Nolen, P., 2012b. Choosing to compete: how different are girls and boys? J. Econ. Behav. Org. 81, 542–555.
Buser, T., Niederle, M., Oosterbeek, H., 2014. Gender, competitiveness, and career choices. Q. J. Econ. 129 (3), 1409–1447.
Castillo, M., Leo, G., Petrie, R., 2015. Room Composition Effects on Risk Taking by Gender, Working Paper. George Mason University, Department of Economics.
Charness, G., Gneezy, U., 2012. Strong evidence for gender differences in risk taking. J. Econ. Behav. Org. 83, 50–58.
Charness, G., Rustichini, A., 2011. Gender differences in cooperation with group membership. Games Econ. Behav. 72, 77–85.
Charness, G., Rigotti, L., Rustichini, A., 2007. Individual behavior and group membership. Am. Econ. Rev. 97, 1340–1352.
Chattopadhyay, R., Duflo, E., 2004. Women as policy makers: evidence from a randomized policy experiment in India. Econometrica 72, 1409–1443.
Chaudhuri, A., 2011. Sustaining cooperation in laboratory public goods experiments: a selective survey of the literature. Exp. Econ. 14, 47–83.
Chen, R., Chen, Y., 2011. The potential of social identity for equilibrium selection. Am. Econ. Rev. 101, 2562–2589.

Chen, Y., Li, S.X., 2009. Group identity and social preferences. Am. Econ. Rev. 99, 431–457.
Croson, R.T.A., Gneezy, U., 2009. Gender differences in preferences. J. Econ. Lit. 47, 448–474.
Croson, R.T.A., Marks, M., Snyder, J., 2008. Groups work for women: gender and group identity in social dilemmas. Negot. J. 2008 (October).
D'Espallier, B., Gueírin, I., Mersland, R., 2011. Women and repayment in microfinance: a global analysis. World Dev. 39, 758–772.
Dufwenberg, M., Muren, A., 2006. Gender composition in teams. J. Econ. Behav. Org. 61, 50–54.
Eckel, C.C., Grossman, P.J., 2005. Managing diversity by creating team identity. J. Econ. Behav. Org. 58, 371–392.
Eckel, C.C., Grossman, P.J., 2008. Differences in the economic decisions of men and women: experimental evidence. In: Plott, C., Smith, V. (Eds.), Handbook of Experimental Economics Results, vol. 1. Elsevier, New York, pp. 509–519, Chapter 57.
Ertac, S., Gurdal, M.Y., 2012. Deciding to decide: gender: leadership and risk-taking in groups. J. Econ. Behav. Org. 83, 24–30.
Feigenberg, B., Field, E., Pande, R., Rigol, N., Sarkar, S., 2014. Do group dynamics influence social capital gains among microfinance clients? Evidence from a randomized experiment in urban India. J. Policy Anal. Manage. 33, 932–949.
Fenwick, G.D., Neal, D.J., 2001. Effect of gender composition on group performance. Gender Work Org. 8, 205–225.
Giné, Z., Karlan, D., 2014. Group versus individual liability: short and long term evidence from philippine microcredit lending groups. J. Dev. Econ. 107, 65–83.
Giné, X., Jakiela, P., Karlan, D., Morduch, J., 2010. Microfinance games. Am. Econ. J. Appl. Econ. 2, 60–95.
Goette, L., Huffman, D., Meier, S., 2006. The impact of group membership on cooperation and norm enforcement: evidence from random assignments to real social groups. Am. Econ. Rev. Pap. Proc., 212–216.
Kuhn, P., Villeval, M.C., 2015. Are women more attracted to co-operation than men? Econ. J. 582, 115–140.
Masclet, D., Colombier, N., Denant-Boemont, L., Lohéac, Y., 2009. Group and individual risk preferences: a lottery-choice experiment with self-employed and salaried workers. J. Econ. Behav. Org. 70, 470–484.
Niederle, M., Vesterlund, L., 2007. Do women shy away from competition? Do men compete too much? Q. J. Econ. 122, 1067–1101.
Sally, D., 1995. Conversation and cooperation in social dilemmas: a meta- analysis of experiments from 1958 to 1992. Rational. Soc. 7 (1), 58–92.
Sell, J., Griffin, W.I., Wilson, R., 1993. Are women more cooperative than men in social dilemmas? Soc. Psychol. Q. 56, 211–222.
Sharma, M., Zeller, M., 1997. Repayment performance in group based credit programmes in Bangladesh. World Dev. 25, 1731–1742.
Smith, N., Smith, V., Verner, M., 2006. Do women in top management affect firm performance? A panel study of 2,500 Danish firms. Int. J. Product. Perform. Manage. 55, 569–593.
Tiger, L., 1984. Men in groups, Marion Boyars Publishers Ltd.
Wydick, B., 1999. Can social cohesion be harnessed to repair market failures? Evidence from group lending in Guatemala. Econ. J. 109, 463–475.