Does group discussion lead to better informed and more strategic market entry decisions?

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Abstract

We investigate the possibility of group discussion serving as an implicit information channel to eliminate biased entry decisions into experimental markets. We find that groups are more informed than individuals in their beliefs. Nevertheless they make similarly biased market entry decisions failing to learn from feedback and repetition.

Keywords: Experimental market entry games, Group decision making, Information

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1 Introduction

Previous research has shown that the industries with high entry rates tend to have high rates of business failure independent of the size of the industry, the profitability or barriers to entry (Dunne, Roberts & Samuelson 1988; Mata & Portugal 1994, Geroski 1996). Motivated by these findings, Camerer & Lovallo (1999) link the success of entrants in experimental markets to their performance in a trivia quiz and explain excess entry by entrepreneurial overconfidence. Moore & Cain (2007; henceforth M&C) replicate Camerer and Lovallo's experiment extending it to involve difficult as well as simple quizzes. Subjects *enter excessively* into markets with simple and *insufficiently* into markets with difficult quizzes against the benchmark condition where entrants' success is determined randomly.[1]

M&C attribute this difference in entry rates to asymmetric information one possesses about self versus others. Providing explicit information on competitors' performance demonstrably decreases competitive entry failures in foregone profits and direct losses (Radzevick & Moore 2008; Ewers 2012). In this paper, we investigate the possibility of group discussion providing implicit information in market entry games with simple and difficult quiz tasks. We speculate that group discussion may deliver additional information about general knowledge and quiz difficulty among participants in the experiment. This additional information in turn may help infer competitors' performance leading to more strategic market entry decisions.

A further rationale to study groups' competitive entry decisions is that many important real world competitions are between groups rather than individuals, such as in inter-organizational grant contests and sports tournaments. It is not surprising that recently, group decision making has aroused considerable interest in economic research. The main finding has been that groups make more self-interested strategic decisions, are cognitively more sophisticated than individuals and learn faster (reviewed by Charness & Sutter 2012). Kocher & Sutter (2005) and Sutter (2005) show that groups of three perform better in beauty contest games compared to individuals. Market entry games are similar to beauty contest games with an analogous requirement to engage in hierarchical reasoning and act strategically based on predictions of other players' decisions. We thus test whether groups' decisions are more strategic to start with and whether groups are more likely to learn from repetition and feedback compared to individuals.

2 Experimental Design

We replicated M&C's design as a baseline condition (*Individual*) and extended it with a treatment condition (*Group)* and a control condition (*IndInfo*) to investigate whether group discussion led to better informed and more strategic entry decisions. Individual and IndInfo conditions were identical except in the IndInfo condition subjects were given additional information on the average number of correct answers per quiz in previous sessions before their entry decisions took place. In the Group treatment, 21 participants were randomly allocated group numbers and seated in separated cubicles in groups of three. Group members could talk face-to-face among themselves without being heard by others and submit one decision per group in each round.

The experiment consisted of a 12 round market entry game with 7 players deciding simultaneously whether to enter a market or to stay out. Payoffs were determined according to Table

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[1] Cain, Moore & Haran (2015) further show that overconfidence in simple and underconfidence in difficult tasks can explain current trends in market entry behaviour in the field: controlling for entry barriers, entry rates are below market capacity in markets perceived as difficult (e.g. metal mining, forestry, agricultural) and above market capacity in markets perceived as simple (e.g. food stores, hobby shops).

1 and were common knowledge.[2] Each player had to submit one decision per round indicating their choice. There were four simple, four difficult and four random rounds, where the ranks of entrants were determined according to their scores respectively in simple and difficult quizzes and randomly. The rounds were presented to subjects either in Simple-Random-Difficult or Difficult-Random-Simple order with the quiz order also re-shuffled across sessions to avoid any order effects.

The quizzes were pre-tested on British students so that the variance in answers between the subjects would be minimal: out of 5, the correct answers averaged to 0.65 (s.d. 0.70) in the difficulty and 4.3 (s.d. 0.9) in the easy quizzes. Thus, winning in a quiz round was mostly due to luck, being very comparable to random rounds. Additionally, players' decisions in the random rounds acted as within-subject control for their risk attitudes and the difference in entry rates into random and quiz rounds was our primary measure of excessive and insufficient entry.

Table 1: Experimental Payoffs from Entering into Market

Rank	Payoff
1st	£14
2nd	£10
3rd	£5
4th	-£10
5th	-£10
6th	-£10
7th	-£10

Staying out paid £0. Losses were subtracted from the £10 endowment subjects received at the beginning of the experiment.

Following M&C, we elicited beliefs of players after their entry decisions with the following unincentivized questions:[3]

Q1. How many players in total do you think entered the market this round? Include yourself in this figure if you chose to enter.

Q2. How many of the other six players in this round do you think scored higher than you did? (regardless of whether anyone entered)

Q3. How many quiz questions do you think you got correct in this round?

Q4. How many quiz questions do you think the average player got correct this round?

Q5. If you chose to enter the market this round, what rank do you think you will get?

After answering these questions, every individual/group received full feedback on their own and others' quiz scores, entry decisions and rankings.

In total 210 British students recruited through ORSEE (Greiner 2015) participated in 18 experimental sessions at the University of Nottingham yielding 6 independent clusters per treatment. The experiment lasted 60 minutes with an average payment of £11.70 determined according to a random incentive scheme across rounds. The design was partly computerized using the software Ztree (Fischbacher 2007) and partly pen-and-paper to accommodate for the open-ended-answer format of quizzes.[4]

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[2] Each group member earned the same amount in order to keep the marginal incentive for each player constant and comparable to the individual conditions.

[3] Sutter et al. (2013) report significant differences in belief formation process between groups and individuals. For the purposes of replication, we chose to keep the belief elicitation in the Group treatment the same and not restrict what groups could report and how.

[4] See Appendix A for the experimental instructions, quizzes, a sample feedback screen and decision sheet.

3 Results

3.1 Are groups better informed than individuals?

In Table 2 we test for the accuracy in beliefs of groups compared to individuals for each of the five belief elicitation questions. Overall we find that groups are slightly more informed than individuals: their predictions of own score (Q3) in the simple rounds, average score (Q4) and own rank conditional on entry (Q5) in difficult rounds is significantly more accurate than individuals. However groups are not as accurate as individuals with additional information: all beliefs in the IndInfo condition, except in Q3 of simple rounds, are more accurate than in the Group treatment.

Table 2

Dependent Variable: Mean absolute difference between predicted and actual			
Q1	**Simple**	**Difficult**	**Random**
Individual	0.21 (.28)	0.13 (.28)	-0.21 (.25)
IndInfo	-0.17 (.27)	-0.46 (.29)	-0.08 (.22)
Constant	1.21 (.19)***	1.46 (.19)***	1.29 (.19)***
N	504	504	497
Q2	**Simple**	**Difficult**	
Individual	0.11 (.22)	0.27 (.20)	
IndInfo	-0.47 (.11)***	-0.01 (.14)	
Constant	1.79 (.06)***	1.89 (.13)***	
N	504	503	
Q3	Simple	Difficult	
Individual	1.15 (.51)**	0.90 (.59)	
IndInfo	0.21 (.06)***	-0.25 (.04)***	
Constant	0.22 (.05)***	0.48 (.04)***	
N	502	502	
Q4	Simple	Difficult	
Individual	0.47 (.32)	1.05 (.39)**	
IndInfo	-0.17 (.05)***	-0.14 (.09)	
Constant	0.69 (.05)***	0.84 (.05)***	
N	504	503	
Q5	Simple	Difficult	
Individual	-0.03 (.22)	0.46 (.26)*	
IndInfo	-0.24 (.27)	-0.03 (.18)	
Constant	1.61 (.11)***	1.10 (.16)***	
N	341	190	

The reported coefficients are from an OLS regression with the baseline Group.
Clustered standard errors at session level are reported in parentheses.
*10%, **5%, ***1% significance levels.

3.2 Do groups make more strategic market entry decisions?

Figure 1 plots the entry rates in each treatment across 12 rounds and shows a successful replication of M&C's results in our Individual treatment. Table 3 tests for the significance of entry biases across treatments in the first and second halves of the experiment. We observe no difference between Individual and Group treatment in the first half of the experiment where both individuals and groups enter excessively into simple and insufficiently into difficult rounds compared to their entry rates in random rounds. In the second half of the experiment we still observe significant bias in entry decisions of groups and individuals with significantly higher excess entry of groups into simple rounds.

In the IndInfo treatment on the other hand, we observe more strategic entry decisions with a lower difference in entry rates between quiz and random rounds in the first half which completely

disappears in the second half of the experiment. In Appendix B, we present a plot of mean payoffs across rounds for each treatment condition and test for treatment differences in mean payoffs. We find that, overall, groups earn slightly more than individuals in the Individual but less than those in the IndInfo condition. This difference in earnings is mainly due to the significant differences in payoffs in the simple rounds of the experiment, accentuating the implications of excessive entry into markets. This result in turn shows the economic significance of biased entry decisions and how explicit information in the IndInfo treatment but not implicit information in the Group treatment earned subjects more money.
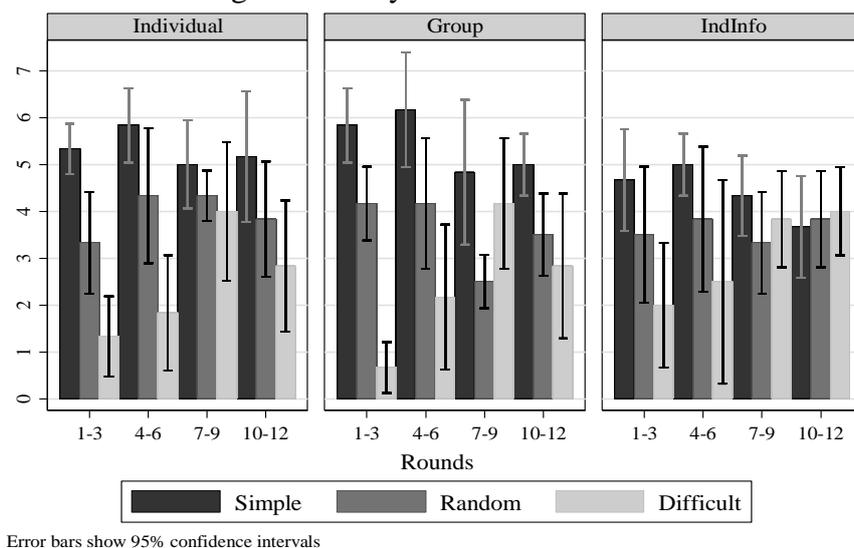
Figure 1: Entry rates across rounds

Error bars show 95% confidence intervals

Table 3

	Rounds 1-6			Rounds 7-12		
Pairwise test of mean difference between simple, random and difficult rounds equals to zero						
Mean Difference	**MS—MD**	**MS—MR**	**MD—MR**	**MS—MD**	**MS—MR**	**MD—MR**
Individual	4.00 (.29)**	1.75 (.11)**	-2.25 (.33)**	1.67 (.42)**	1.00 (.29)**	-0.07 (.36)
Group	4.58 (.57)**	1.83 (.38)**	-2.75 (.38)**	1.42 (.66)*	1.92 (.30)**	0.50 (.62)
IndInfo	2.58 (.30)**	1.17 (.28)**	-1.42 (.51)**	0.08 (.49)	0.42 (.38)	0.33 (.44)
p-values from a pairwise test of equality of mean differences between treatment conditions						
Group=Individual	0.3743	0.7992	0.3708	0.6279	0.0613	0.1705
Group=IndInfo	0.0240	0.2469	0.0641	0.2248	0.0147	0.9358
Individual=IndInfo	0.0121	0.0750	0.1970	0.0325	0.2850	0.1201

*MS: Mean Entry in Simple, MR: Mean Entry in Random and MD: Mean Entry in Difficult round. Standard errors are in parentheses. **5%, ***1% significance levels according to matched pair signed rank test. P-values are from Wilcoxon ranksum test.*

4 Conclusion

A recent research agenda in business and economics literature has investigated the effects of incorrect beliefs on individuals' decisions to enter excessively into competitions with easy and avoid competitions with difficult tasks. Additional information on competitors' performances in turn was been shown to correct those beliefs and decrease competitive entry failures (Radzevick & Moore 2008; Ewers 2012). As a novel research question we propose that group discussion provides implicit information channel leading to more strategic market entry decisions. Our experiment confirms that groups hold more accurate beliefs than individuals in predicting their own and others' performance and ranks. However, we do not find any evidence of this leading to more strategic entry decisions:

both individuals and groups enter excessively into simple and insufficiently into difficult markets and earn less than individuals who are provided with explicit performance information.

One caveat to our study in concluding that groups make similar entry decision to individuals is our focus on face-to-face group discussion and joint entry decisions. This however is one of the most natural environments that group decision making takes place in the "wild" and is a good starting point to answer whether groups make more strategic competitive entry decisions than individuals. Other group environments, such as voting on the entry decision or individual decision making following group discussion, are areas for further research.

References

- Cain, D.M., Moore, D. A. and Haran, U. 2015. Making Sense of Overconfidence in Market Entry, Strategic Management Journal, 36, 1-18.
- Camerer, C. and Lovallo, D. 1999. Overconfidence and Excess Entry: An experimental Approach, The American Economic Review, 89, 306-318.
- Charness, G. and Sutter, M. 2012. Groups Make Better Self-Interested Decisions. Journal of Economics Perspectives, 26, 157-176.
- Dunne, T., Roberts, M. J., & Samuelson, L. 1988. Patterns of Firm Entry and Exit U.S. Manufacturing Industries. Rand Journal of Economics, 19, 495-515.
- Ewers, M. 2012. Information and Competition Entry. IZA Discussion Paper. No6411.
- Fischbacher, U. 2007. z-Tree: Zurich Toolbox for Ready-made Economic Experiments. Experimental Economics, 10, 171-178.
- Geroski, P. A. 1996. What do we know about entry? International Journal of Industrial Organization, 13, 421–441.
- Greiner, B. 2015. Subject pool recruitment procedures: organizing experiments with ORSEE. Journal of the Economic Science Association, 1, 114-125.
- Kocher, M.G., & Sutter, M. 2005. The Decision Maker Matters: Individual versus Group Behaviour in Experimental Beauty-Contest Games. The Economic Journal, 115, 200-223.
- Mata, J., & Portugal, P. 1994. Life Duration of New Firms. The Journal of Industrial Economics, 42, 227-245.
- Moore, D.A. and Cain, D.M. 2007. Overconfidence and Underconfidence: When and Why People Underestimate (and Overestimate) the Competition. Organizational Behaviour and Human Decision Processes, 103, 197-213.
- Radzevick, J.R. and Moore, D.A., 2008. Myopic biases in competitions. Organizational Behavior and Human Decision Processes, 107, 206-218.
- Sutter, M. 2005. Are four heads better than two? An Experimental Beauty-contest Game with Teams of Different Size. Economics Letters, 88, 41-46.
- Sutter, M., Czermak, S., Feri, F. 2013. Strategic sophistication of individuals and teams. Experimental evidence. European Economic Review, 64, 395-410.

Welcome!

You are about to participate in an experiment. There are 7 [21] people participating in the experiment [and participants have been divided into 7 groups of 3. This group composition will remain fixed for the whole experiment.] You must not communicate with anyone. [You will be allowed to communicate with people in your group but you must not communicate with anyone outside your group.] If you have a question at any time during the experiment, please raise your hand and someone will come to your desk to answer it.

The use of electronic devices such as mobile phones, music players, and tablet computers is strictly prohibited. Please make sure that all such devices are turned off and put away out of sight.

If you break these rules, you will be excluded from the experiment without receiving any payment and be disqualified from future experiments with CeDEx.

Market Entry Experiment

In this experiment, you [your group] will be playing the role of an entrepreneur who has to choose whether to enter into new markets. Entering a new market can be highly profitable if your group does well. On the other hand, if competition is too tough, you [your group] may lose money. The experiment will consist of a number of rounds. In each round, you [your group] will make one entry decision. The decisions made [by groups] will affect your final payoff.

Each round, market rankings will be determined in one of two ways. In some rounds, the rankings of all entrants will be determined by scores on a trivia quiz. In other rounds, all entrants will be ranked randomly (by being assigned a random score). In each round, the participants [groups] that have entered will be ranked according to their scores and they [their group members] will receive payoffs according to this table:

Your [Group's] Rank	Point Payoff [for Each Member of Your Group]
1st	14
2nd	10
3rd	5
4th	-10
5th	-10
6th	-10
7th	-10

The top 3 people [groups] who decided to enter the market will each earn points. Higher-ranked entrants will earn more, according to the table above. If more than 3 people [groups] enter the market, those [the members of groups] ranked below 3rd will lose 10 points each. You [your group] may always choose to stay out of the market; staying out means you neither gain nor lose anything.

For participating in this experiment, each of you will receive a £10 base payment. In addition, you can earn points in each round as described above. At the end of the experiment, three of the rounds will be randomly selected and your points from those three rounds will be averaged and then converted into cash at a rate of £1 per point. For each of you, this amount will be added to (or, if you lost points, subtracted from) your £10 base payment.

Manipulation in the IndInfo Treatment

Entrepreneur ID _____

Ranking System: Trivia Quiz

		Answers
1.	What is the capital city of Suriname?	
2.	What is the surname of the German brothers known for their collections of fairy tales? Brothers …..	
3.	What is the real name of the actress playing Aunt Tina Little in the 1999 film "Stuart Little"?	
4.	Who was the Prime Minister of the United Kingdom from 1905 to 1908?	
5.	What country in Africa borders only with Senegal?	
Tiebreaker: What is the height of Eiffel Tower in metres?		

For questions 1-5, for each correct answer you will get 10 marks.

For the tie-breaker question, the closest answer to the correct answer will get 7 marks, the second closest will get 6 marks, the third closest 5 marks and so on.

Your score in this round is the total of these marks in this round.

The average number of correct answers for this quiz in previous sessions was 0.9 out of 5 questions.

Do you choose to enter the market and compete or do you choose to stay out?

☐ Enter the market   ☐ Stay out

[Note: The frame is added to highlight the information manipulation in the IndInfo treatment. Subjects did not see the frame in their decision sheets.]

2

Quizzes [the answers are given in parentheses]

Simple A
What is the capital city of Greece? [Athens]
Who is the author of the "Harry Potter" books? [J.K. Rowling]
What is the character name of the animated star of the computer game and movie Tomb Raider? [Lara Croft]
What was the first name of Bonaparte, a French military and political leader of late 18th early 19thcenturies France? [Napoleon]
Which country, located in the northern Eurasia, is the largest country in the world? [Russia]
Tiebreaker: What is the height of Eiffel Tower in metres? [320]

Simple B
What is the capital city of Argentina? [Buenos Aires]
Who wrote the play "Hamlet"?   [Shakespeare]
Which actress played the title role in the 1990 film "Pretty Woman"? [J. Roberts]
What was the name of the admiral famously known for his part in the victory of Britain in the Battle of Trafalgar? [Nelson]
Which river, located in Northern Africa, is the longest river in the world? [Nile]
Tiebreaker: How many member states are there in United Nations? [193]

Simple C
What is the capital city of France? [Paris]
Who wrote the novel "The Life and Adventures of Nicholas Nickleby"? [Charles Dickens]
Which cartoon show included characters called Thelma and Shaggy? [Scooby doo]
What was the name of the famous ship that left the British port of Southampton with the aim of reaching New York City in the United States in 1912 but tragically sank on its Maiden Voyage? [Titanic]
Which mountain peak, located in the range Himalayas, is the highest peak in the world? [Everest]
Tiebreaker: How many films did Alfred Hitchcock direct (including short films and documentaries)? [61]

Simple D
What is the capital city of China? [Beijing]
Please complete the title of the Tolstoy's novel: "War and …. [Peace]
What type of animal was Stuart, in the 1999 film "Stuart Little"? [Mouse]
Who served as a Prime Minister of the United Kingdom from 2007 to 2010? [Gordon Brown]
What mountain peak, located in Scotland, is the highest peak in Britain? [Ben Nevis]
Tiebreaker: How many men signed the American Declaration of Independence? [56]

Difficult A
What is the capital city of Bahrain? [Manama]
Who wrote the novel "Master and Margarita"? [Bulgakov]
Who is the voice of adult Simba in the 1994 film "The Lion King"? [Matthew Broderick]
What is the name of the Battle also known as Battle of the Nations fought in 1813 by Russia Prussia, Austria and Sweden against Napoleon? [Leipzig]

Which mountain peak, located in the range of Guiana Highlands, is the highest peak in Brazil? [Pico de Neblina]

Tiebreaker: How many days did British-American astronaut Michael Foalespend in space? [374]

Difficult B
What is the capital city of Togo? [Lome]
What Chilean author wrote Sub Terra? [Baldomero Lillo]
What is the real name of the actor playing the character Cramden in the 2008 film "Toe Tactic"? [John Sayles]
Who was the Prime Minister of United Kingdom from 1937 to 1940? [Chamberlain]
Which river, with its source in the Great Slave Lake, is the longest river in Canada? [Mackenzie]
Tiebreaker: How many thousands of squared kilometres is the area of Madagascar? [587]

Difficult C
What is the capital city of Suriname? [Paramaribo]
What is the surname of the German brothers known for their collections of fairy tales? Brothers ….. [Grimm]
What is the real name of the actress playing Aunt Tina Little in the 1999 film "Stuart Little"? [Connie Ray]
Who was the Prime Minister of the United Kingdom from 1905 to 1908? [Henry Campbell-Bannerman]
What country in Africa borders only with Senegal? [Gambia]
Tiebreaker: How many thousand kilometres is the coastline of Canada? [202]

Difficult D
What is the capital city of Russia? [Moscow]
What was the surname of the literary character Nana in Emil Zola's novel titled "Nana"? [Coupeau]
What is the real name of the actor playing The Tin Man in the 1939 film "Wizard of Oz"? [Jack Haley]
Who was the king of England between 1327 and 1377? [Edward III]
What country surrounds two other countries? [Italy]
Tiebreaker: What year was the ex-Prime minister of United Kingdom Arthur Balfour born? [1848]

Sample Feedback Screen as seen after Round 8

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
Entrepreneur 1								
Score	56	7	7	55	2	27	56	6
Entry	Enter	Enter	Stay Out	Enter	Enter	Enter	Enter	Enter
Rank	1	1	--	3	3	1	2	1
Entrepreneur 2								
Score	41	4	3	56	7	15	57	3
Entry	Enter	Stay Out	Enter	Enter	Stay Out	Stay Out	Enter	Enter
Rank	5	--	1	2	--	--	1	3
Entrepreneur 3								
Score	52	1	1	57	6	6	55	4
Entry	Stay Out	Enter	Enter	Enter	Enter	Enter	Enter	Stay Out
Rank	--	4	2	1	1	3	3	--
Entrepreneur 4								
Score	54	2	15	53	5	2	54	1
Entry	Enter	Stay Out	Stay Out	Stay Out	Stay Out	Stay Out	Enter	Stay Out
Rank	3	--	--	--	--	--	4	--
Entrepreneur 5								
Score	57	6	2	41	4	13	51	5
Entry	Stay Out	Enter	Stay Out	Enter	Stay Out	Stay Out	Stay Out	Enter
Rank	--	2	--	5	--	--	--	2
Entrepreneur 6								
Score	53	3	6	52	1	11	43	7
Entry	Enter	Enter	Stay Out	Enter	Stay Out	Enter	Enter	Stay Out
Rank	4	3	--	4	--	2	5	--
Entrepreneur 7								
Score	55	5	14	44	3	4	42	2
Entry	Enter	Stay Out	Stay Out	Stay Out	Enter	Stay Out	Enter	Stay Out
Rank	2	--	--	--	2	--	6	--

Appendix B

Table B1

Dependent Variable: Mean Payoff with the Group treatment as baseline			
Simple	**Rounds 1-6**	**Rounds 7-12**	**All rounds**
Individual	-1.07 (.47)**	-1.37 (.56)**	-1.22 (.41)***
IndInfo	1.67 (.57)***	1.13 (.56)**	1.39 (.51)**
Constant	-0.14 (.43)	1.40 (.40)	.63 (.38)
N	252	252	504
Difficult	**Rounds 1-6**	**Rounds 7-12**	**All rounds**
Individual	0.01 (.59)	-0.06 (.71)	-0.03 (.37)
IndInfo	0.58 (.51)	0.18 (.65)	0.38 (.37)
Constant	2.04 (.27)***	2.65 (.44)***	2.35 (.29)***
N	252	252	504
Random	**Rounds 1-6**	**Rounds 7-12**	**All rounds**
Individual	0.12 (.55)	-0.71 (.43)	-0.29 (.45)
IndInfo	0.36 (.42)	-0.29 (.28)	0.03 (.29)
Constant	2.29 (.14)	3.43 (.12)***	2.86 (.10)***
N	252	252	504
Overall	**Rounds 1-6**	**Rounds 7-12**	**All rounds**
Individual	-0.32 (.32)	-0.71 (.39)*	-0.51 (.29)*
IndInfo	0.87 (.36)**	0.34 (.33)	0.60 (.32)*
Constant	1.39 (.23)***	2.49 (.22)***	1.94 (.22)***
N	756	756	1512

*The reported coefficients are from an OLS regression. Clustered standard errors at session level are reported in parentheses. * 10%, ** 5%, *** 1% significance levels.*

Figure B1: Mean Payoff across Rounds
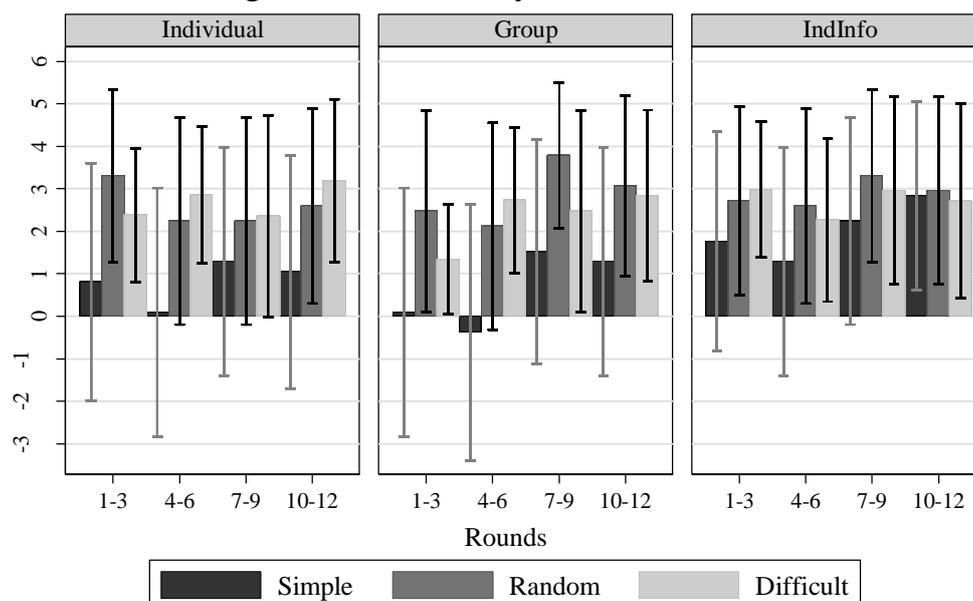
Mean payoff is calculated by taking the arithmetic mean of realized payoffs from entering or staying out of the market. Error bars show 95% confidence intervals