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Cognitive ability and human behavior in experimental ultimatum games*

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Abstract

We investigate the relationship between decisions made in experimental ultimatum games and the cognitive ability of participants (students and adults aged 20s–80s). We find that the relationship between the offer amount and cognitive ability is quadratic and concave: a sender with lower cognitive ability offers about 25% of the endowment compared with 50% and 40% for senders with middle and high cognitive ability, respectively. However, we find no relationship between receiver behavior and cognitive ability. These findings suggest that cognitive ability plays an important role when a participant faces a more strategic role.

Keywords: Ultimatum game, experimental study, Cognitive ability, Non-student participant

JEL codes: C72, C78, C91

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1. Introduction

In this study, we investigate the relationship between the cognitive ability of a participant and his or her decision-making in experimental ultimatum games. The basic ultimatum game has two stages and two players: a sender and a receiver. In the first stage, the sender is given a certain amount of money as an endowment and chooses how much he or she offers to his or her receiver. In the second stage, the receiver chooses whether to accept this offer. If the receiver accepts, the offer is realized; otherwise, neither player receives any money.

Assuming that a player is rational and self-interested, we can introduce the sub-game perfect Nash equilibrium by using backward induction. In this setting, the receiver accepts all offers in the second stage because rejection never increases his or her payoff. A sender will thus reason the receiver's response and offer to maximize the sender's payoff. Therefore, the sender offers the minimum amount to the receiver and the receiver accepts this offer.

Güth et al. (1982) were the first authors to conduct ultimatum game experiments. Subsequent ultimatum game experiments have typically found that a sender offers about 40–50% of the endowment and that a receiver accepts this offer. When the offer is small, some receivers reject this offer, however (Camerer, 2003). Thus, the sub-game perfect equilibrium is not always observed for three reasons. Firstly, a sender offers to reduce the inequality between the sender and receiver (Fehr and Schmidt, 1999). Secondly, the sender has an altruistic utility function. Thirdly, the sender fears the receiver might reject a small offer.[1]

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[1] For example, a receiver's spite may lead him or her to reject a small offer. Even if the receiver receives no payoff, he

However, few studies have investigated how the cognitive ability of a participant influences behavior in experimental ultimatum games,[2] with some pointing out that cognitive ability has a close relationship with human behavior in the laboratory in contrast to the expectations of economic theory. Because cognitive ability is only one source of decision-making, clarifying how this ability affects human behavior thus makes the investigation of economic decision-making richer.[3]

Studies have used Raven's score (Raven, 1936) and/or cognitive reflection tests to investigate the relationship between human behavior in the laboratory and the cognitive abilities of participants. In particular, in the experimental p-beauty contest game,it has been shown that the higher cognitive ability, the faster the person chooses the equilibrium value (Brañas-Garza et al., 2012; Gill and Prowse, 2014), suggesting that a person with higher cognitive ability can reason more deeply. Hanaki et al. (2014) found that in an experimental coordination game, the percentage observing the Pareto-efficient equilibrium is significantly different when a participant plays with a computer agent or with another participant. This difference stems from the cognitive ability of a participant: those with middle and high levels of cognitive ability choose the Pareto-efficient dominant strategy when the participant plays with the computer agent significantly more than when playing with another participant. However, the percentage

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or she may feel satisfaction that the sender also receives nothing.

[2] Few studies focus on how participants behave close to the sub-game perfect equilibrium in experimental ultimatum games. Solnick (2001) investigated the effect of gender differences on decision-making and Brandstätter and Güth (2002) examined the effect of personality traits on decision-making.

[3] If a participant with higher cognitive ability offers closer to that of a rational and self-interested person and a participant with lower cognitive ability makes an altruistic offer, the explanations of standard game theory and social preference theory would fit with the former and latter, respectively.

of those with lower cognitive ability is not significantly different in either case. Thus, cognitive ability affects how to deal with the strategic uncertainty.

Benito-Ostolaza et al. (2016) experimentally analyzed the relationship between cognitive ability and strategic behavior in a sequential game, where computing the equilibrium is challenging. They found that participants with higher cognitive ability play more strategically. Hanaki et al. (2015) investigated price-setting behavior in the experimental stock market and the distribution of the cognitive ability of a market participant. They observed mispricing behavior most frequently when participants with higher or lower cognitive ability jointly participate in the market, suggesting that diversity in cognitive ability and in information on the types of cognitive ability could lead participants to misprice.

In the present study, we investigate how cognitive ability influences behavior in experimental ultimatum games by designing two treatments and using two participant groups. The treatments are the sequential decision (SD) and strategy vector method (SM) treatments, as investigated by Oxoby and McLeish (2004).[4] In the SD treatment, a typical ultimatum game is conducted. In the SM treatment, before a role is determined, a participant decides the offer amount when he or she is assigned as a sender and decides to accept any possible amount. Oxoby and McLeish (2004) found that behavior is not significantly different in both treatments.

To check the robustness of the effect of cognitive ability on behavior, we use not only

[4] Brandts and Charness (2011) summarized that 19 studies do not find a difference between SM and SD (see also Brandts and Charness, 2000), four find a significant difference between SM and SD in experimental games on punishment, and nine find mixed results. They classified Oxoby and McLeish (2004) into the last category and pointed out that the acceptance rate for a small offer might be significantly different between SM and SD.

undergraduate student but also adult non-student participants of different ages. Teck et al. (2015) included adult participants in an experimental ultimatum game. Bailey et al. (2013) found that the older a person is, the more generous he or she is, while Beadle et al. (2012) showed that the offer amount is not significantly different between younger and older senders. Similarly, Harle and Sanfey (2012) found that as a person ages, he or she rejects unfair offers as well as slightly unfair offers (about 30% of the endowment). Bellemare et al. (2011) showed that older participants are more likely to reject an unfair offer than younger participants. However, Roalf et al. (2012) found that age does not significantly affect the acceptance rate. Thus, sender and receiver behavior is somewhat inconclusive. Based on this uncertainty in the literature, we control for the aging effect.

The remainder of this article is organized as follows. In section 2, we propose the hypotheses. In section 3, we introduce the experimental settings. In sections 4 and 5, we present and discuss the experimental results. Finally, section 6 concludes.

2. Hypotheses generation

According to Oxoby and McLeish (2004), there is no significant difference in human behavior between SD and SM. However, whether this result holds for non-student participants is currently unclear and serves as the first focus of the present study. Secondly, we investigate the relationship between cognitive ability and human behavior, given that the former has been found to significantly affect price-setting behavior (Hanaki et al., 2015) and decision-making under strategic uncertainty (Hanaki et al., 2014). Thus, we propose the following main hypothesis.

Hypothesis 1: There is a relationship between human behavior and cognitive ability.

However, we do not suppose a specific relationship between cognitive ability and human behavior in experimental ultimatum games in advance. Firstly, we detect whether a relationship can be observed and then depict its characteristics and robustness. If we find that the effect of cognitive ability differs between the two types of treatments, the effect is not robust. Similarly, if we find that the effect differs between the two groups of participants, the effect of cognitive ability is not robust, either. Hence, the sub-hypotheses of this study are as follows:

Hypothesis 1-1: Cognitive ability affects not only sender behavior but also receiver behavior.

Hypothesis 1-2: Regardless of participant type, the effect of cognitive ability remains the same.

3. Experimental settings

In total, 388 participants participated in the experiments. 198 were undergraduate students from Kansai University and 190 were adults. We defined an adult as a non-student individual who has finished compulsory education. To encourage adults to participate in the experiment, we promoted the study via Twitter and distributed leaflets in the northern part of Osaka prefecture. The majority of adult participants came from this area. No participants had experience of participating in an experimental ultimatum game. There were 21 sessions in total. In 11 sessions, all participants were undergraduate students. In 10 sessions, all participants were adults. Table 1 shows the participant profiles.

Table 1: Profile of participants: standard deviation values are in parentheses

	Student	Adult
Number of participants	190	198
Percentage of men	40.9%	52.6%
Average age	20.17 (1.29)	57.49 (15.13)
Average Raven's score	11.06 (2.32)	7.75 (3.09)

In the SD treatment, 96 students and 86 adults participated.The sequence of the game in this treatment is the same as the typical ultimatum games explained in the section 1.

Another condition is the SM treatment[5], wherein 84 students and 112 adults participated. In the first stage, the sender decides the amount of money to send to the receiver. At the same time, the receiver decides whether he or she will accept each potential offer. The sender knows whether the receiver chooses to accept all possible offers. Finally, both players check the result.

All the experiments were programmed by Z-tree (Fischbacher, 2007). As shown in the Appendix, we provided experimental instructions, quizzes on the experimental procedure, and

[5] The decision-making of the sender differed from the SM treatment in Oxoby and McLeish (2004). In their SM treatment, a player makes a decision for both roles: as a sender, he or she chooses how much he or she will offer; as a receiver, he or she chooses to accept all the possible offers.

details on how to play the game with the computer console. After all participants had finished answering the quizzes, we confirmed that all the answers were correct. When a participant (especially an elderly person) was unused to using a mouse, a staff member asked him or her to write down his or her decision in silence and then entered the decision on his or her behalf.

In both treatments, the participation fee was 1,000 JPY. The performance payment ranged from 0 JPY to 2,000 JPY. The experiment lasted about 80 minutes, including the explanation of the experiment, decision-making, answering the questionnaire, and answering the 16 quizzes for measuring Raven's score.[6]

4. Experimental results

Table 2 shows the descriptive statistics. Firstly, we examine hypothesis zero.At the treatment level, the average offer amount is significantly different between SD and SM according to the results of the t-test ($p<0.05$) and Mann–Whitney test ($p<0.06$). However, this significance disappears when offers above 1,000 JPY, which are observed mostly in the SM treatment, are dropped. At the participant level, there is no significant difference for the student sample; however, in the adult case, the offer amount is larger in SM than in SD (t-test with unequal variance, 5% level; Mann–Whitney test, 1% level). Further, if we drop offers above 1,000 JPY (50% of the endowment), the result is not significant in either sample.

[6] Participants answered Raven's test when they participated in an experiment for the first time and answering was unrelated to the monetary reward.

In terms of responses by receiver, there is no significance between treatments, in line with the findings of Oxoby and McLeish (2004). However, we find that behavior is different between students and adults to a small degree. The results of the Mann–Whitney test indicate that in SD, the offer amount is not significantly different between student and adult participants, while in SM, the offer amount is significantly higher by adult participants than by students ($p<0.01$). This finding holds even when we drop offers above 1,000 JPY ($p<0.05$). In the SD treatment, when we drop offers above 1,000 JPY, the offer amount is significantly higher by adult participants than by students (t-test, $p<0.09$). However, there is no significance in either treatment (t-test and Mann–Whitney test) when we focus on student and adult receivers.

Table 2: Descriptive statistics: standard deviation values are in parentheses.

Treatment	SM		SD	
participant type	student	non student	student	non student
The average amount of offer (standard error)	704.54 (49.30)	941.177 (49.561)	697.674 (49.971)	800 (36.709)
	844.660 (32.409)		751.648 (30.835)	
The average acceptance rate (standard error)	0.904 (0.041)	0.843 (0.051)	0.884 (0.049)	0.896 (0.044)
	0.874 (0.0328)		0.890 (0.03296)	

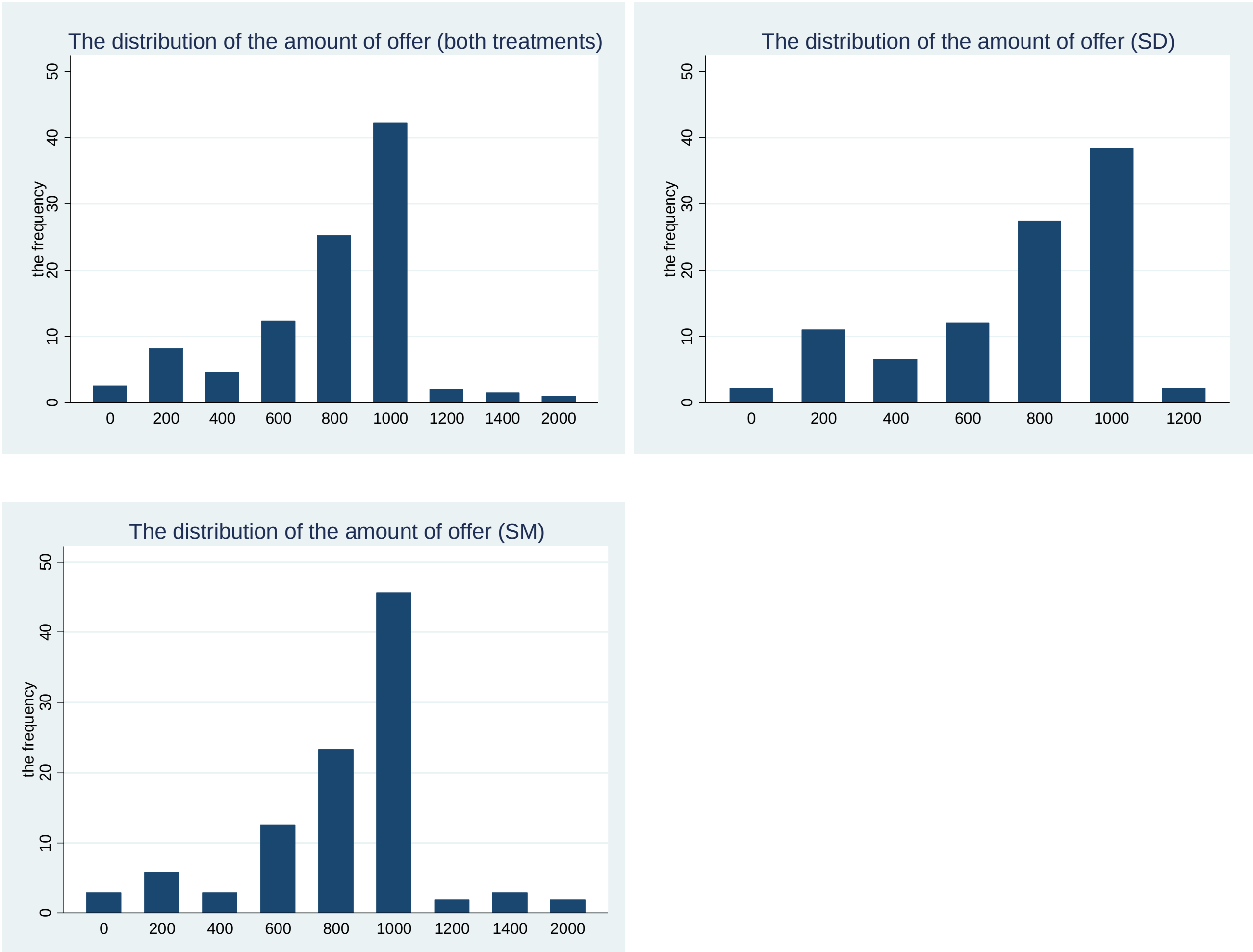

Figure 1: Distribution of the offer amount in each treatment.

4.1 Factors that affect sender behavior

To investigate which factors affect the offer decisions of senders, we focus on the differences in gender, age, and cognitive ability. First, we focus on the decision-making of a sender. We investigate the results of the regression with robust standard errors clustered by session date. In first three models, we use all the offers for the regression, while in the last three models we drop offers above 1,000 JPY because a sender would have no incentive to make such an offer.

Table 3: Regression results: robust standard errors are clustered by session date. *, **, and * indicate 1%, 5%, and 10% significance, respectively.**

3.(a): all offers utilized for the regression

Dep. Var.= the offer amount	Model 1	Model 2	Model 3
Treatment dummy	81.23* (39.90)	76.88* (41.85)	80.26* (40.74)
Male dummy		-129.91 (138.65)	-142.69 (140.34)
Age		-2.60 (3.17)	-4.06 (4.27)
Male dummy × age		3.87 (2.80)	4.33 (2.83)
Student dummy	-851.63 (664.15)	-977.43 (712.58)	-522.38 (663.41)
Elderly dummy			683.66 (515.69)
Raven's score	8.72 (58.6)	-4.50 (65.22)	103.11* (54.03)
Raven's score^2	-0.28 (2.98)	0.22 (3.12)	-5.26* (2.71)
Raven's score × Student dum.	120.31 (130.59)	136.32 (133.24)	28.46 (129.99)
Raven's score^2 × Student dum.	-4.89 (6.11)	-5.44 (6.17)	0.06 (6.07)
Raven's score × Elderly dum.			-152.22 (104.93)
Raven's score^2 × Elderly dum.			8.01 (6.03)
Constant term	779.47 (259.19)	957.33** (428.52)	532.24* (282.21)
Prob. >F	0.0005	0.0002	0.0002
R^2	0.0867	0.1088	0.1247
Number of obs.	189	188	188

3(b): offers above 1,000 JPY dropped.

Dep. Var.= the offer amount	Model 4	Model 5	Model 6
Treatment dummy	35.55 (26.83)	36.69 (30.55)	37.95 (30.71)
Male dummy		-126.23 (137.52)	-133.25 (139.01)
Age		-4.01 (2.33)	-3.26 (3.18)
Male dummy × age		3.67 (2.57)	3.99 (2.61)
Student dummy	-511.93 (624.33)	-711.14 (640.39)	-491.43 (673.37)

Elderly dummy			248.18 (326.32)
Raven's score	64.61*** (20.39)	50.71* (25.69)	96.98* (54.43)
Raven's score^2	-2.74** (1.09)	-2.42* (1.19)	-4.82* (2.72)
Raven's score × Student dum.	59.08 (119.33)	75.87 (120.04)	29.61 (130.78)
Raven's score^2 × Student dum.	-2.17 (5.47)	-2.55 (5.49)	-0.15 (6.09)
Raven's score × Elderly dum.			-64.65 (74.06)
Raven's score^2 × Elderly dum.			3.24 (5.39)
Constant term	486.05*** (92.86)	763.02*** (226.64)	527.68* (278.13)
Prob. >F	0.000001	0.00001	0.00001
R^2	0.0941	0.1175	0.1218
Number of obs.	181	180	180

Remark: treatment dummy is 1 if the treatment is SM, otherwise, 0. Male dummy is 1 if a participant is a man, otherwise, 0. Student dummy is 1 if a participant is a undergraduate, otherwise, 0.

Table 3 presents the results of the regression analysis. From Models 1–3, we see that the treatment dummy is positive and significant at the 10% level. Thus, the offer amount is higher in SM than in SD. Only in Model 3 are Raven's score and the square of this score significant at the 10% level. However, for offers equal to or below 1,000 JPY (Models 4–6), the result changes despite the number of offers over 1,000 JPY being only eight. The treatment dummy is also insignificant. This finding is in line with that of Oxoby and McLeish (2004).

Raven's score and the square of this score are significant at the 5% or 10% level in all three models. The significant relationship between the offer amount and Raven's score is quadratic and concave. This finding indicates that a participant with a certain Raven's score sends the largest offer amount. As shown in Figures 2 and 3, the fitted curve is quadratic and concave in the left and center figures, while it is flat in the right figure because this includes offers above 1,000 JPY. For Model 4, the estimated offer amount = -2.74*(Raven's score)^2 + 64.61*Raven's score + 486.05. From this equation, the estimated offer amount is highest at 1,005 JPY when the score is 11.79.[7]

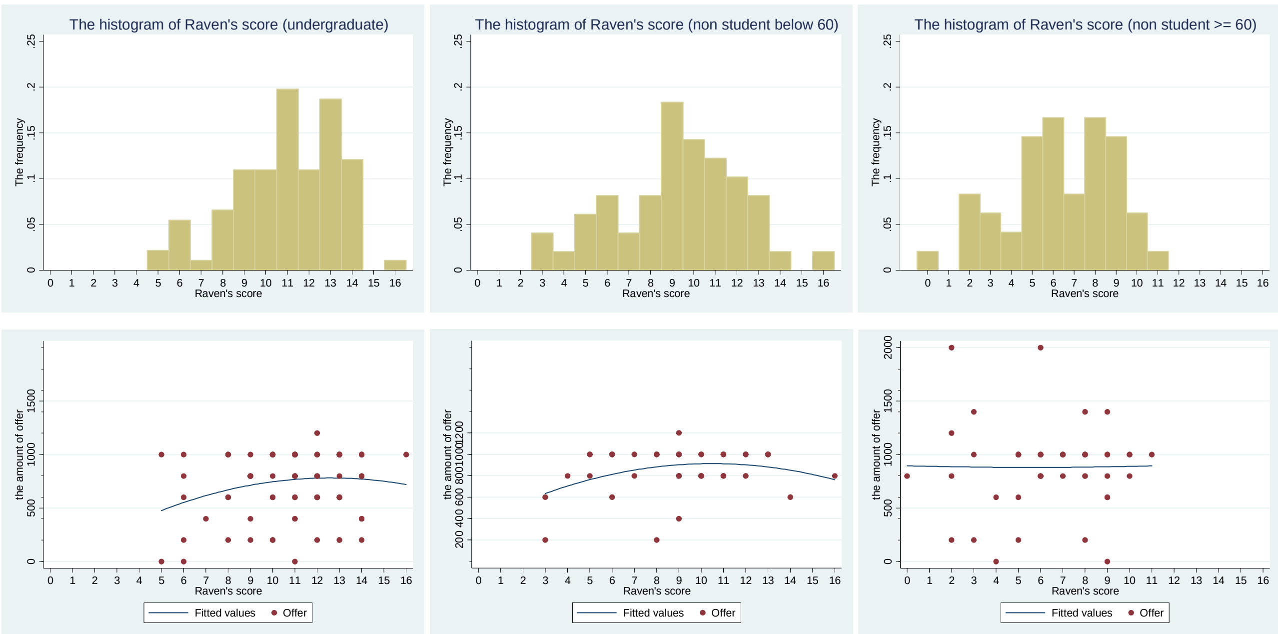

Figure 2: Relationship between the offer amount and Raven's score. The observations in both treatments are merged.

[7] If Raven's score is 7, the estimated offer amount by the participant is 804 JPY.

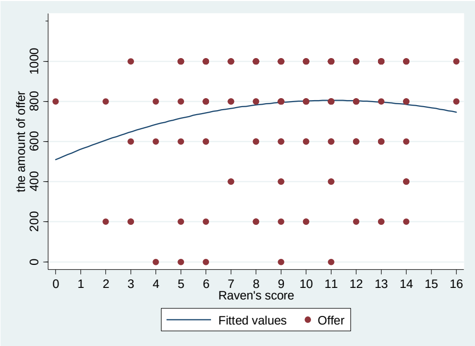

Figure 3: Relationship between the offer amount and Raven's score for offers equal to or below 1,000 JPY. The observations in both treatments are merged.

4.2 Factors that affect receiver behavior

Table 2 indicates that the acceptance rate is similar among treatments and participant types. Indeed, simple statistical tests indicate no significant differences between SD and SM for both student and adult participants. This differs from the results of Roalf et al. (2012). We confirm this finding by using logistic regression with robust standard errors clustered by the session date. Table 4 indicates that the larger the offer, the higher the acceptance rate is. The offer effect on the acceptance rate is robust and we observe all the models on receiver behavior.

The treatment dummy is significant in two models. The acceptance rate is smaller in the SM treatment than in the SD treatment ($p<0.10$). However, in Model 9, which includes the largest number of independent variables, this effect is not significant. The elderly dummy is significant at the 10% level in Model 9. This means that the acceptance rate of a participant aged older than 60 is higher than that of younger adults. Raven's score is not significant in all models. Hence, Raven's score does not affect receiver behavior in contrast to sender behavior.

Table 4: Results of the logistic regressions with robust standard errors clustered by session date.

***, **, and * indicate 1%, 5%, and 10% significance, respectively.

Dep. Var.= the acceptance dummy: 1 if the receiver accepts, otherwise, 0.	Model 7	Model 8	Model 9
Offer amount	1.06*** (0.002)	1.01*** (0.002)	1.01*** (0.002)
Treatment dummy	0.46* (0.20)	0.47* (0.21)	0.47 (0.23)
Male dummy		1.46 (1.32)	1.42 (1.29)
age		1.00 (0.03)	0.99 (0.05)
Male dummy × age		1.01 (0.03)	1.01 (0.03)
Student dummy	24.16 (137.14)	48.48 (273.13)	594.02 (3493.51)
Elderly dummy			988.12* (3593.38)
Raven's score	1.27 (0.39)	1.28 (0.36)	2.74 (1.77)
Raven's score^2	0.99 (0.02)	0.99 (0.01)	0.95 (0.03)
Raven's score × Student dum.	0.84 (1.02)	0.80 (0.96)	0.39 (0.52)
Raven's score^2 × Student dum.	1.00 (0.06)	1.00 (0.06)	1.04 (0.07)
Raven's score ×Elderly dum.			0.15(0.17)
Raven's score^2 × Elderly dum.			1.13 (0.09)
Constant term	0.04* (0.07)	0.02 (0.05)	0.001 (0.005)
Prob. >chi^2	0.0273	0.061	0.00001
Pseudo R^2	0.3682	0.3841	0.4025
Number of obs.	188	186	186

4.3 Summary of the results

When we drop offers above 1,000 JPY, the difference between SD and SM is not significant. Further, the acceptance rate is not affected significantly by the treatment difference as the number of independent variables increases. Thus, our experimental results show that the results of Oxoby and McLeish (2004) are applicable to the case of adult participants.

Hypotheses 1-1 and 1-2 are supported for sender behavior.: the effect of cognitive ability on the offer amount is quadratic and concave, while the effect on acceptance behavior is not significant. Moreover, the effect of cognitive ability on the offer amount is robust. Even if we control for other independent variables such as age and gender, this effect remains significant. Finally, this effect on sender behavior is independent of gender and age.

5. Discussion

The results presented in the previous section suggest which participants offer close to the sub-game perfect equilibrium and which offer close to 50% of the endowment. From the perspective of sender behavior, senders with lower Raven's score make offers close to the sub-game perfect equilibrium, while those with a middle score make offers around half the endowment. In particular, a sender with a score of 12 offers the closest to half the endowment. These results indicate that participants with lower scores are more self-interested and rational than those with higher scores. Hence, we can conclude that the offer amount depends on the cognitive ability of the sender, suggesting that cognitive ability might influence the formation of the utility function and that the shape of the utility function affects the offer amount. However, the influence of cognitive ability on the formation of the utility function might not be unique. Indeed, we cannot detect which cognitive ability influences inequality aversion, altruism, and/or fear of rejection based on our current findings. From the perspective of receiver behavior, we cannot find sufficient evidence about the relationship between cognitive ability and the acceptance rate aside from the obvious fact that the offer amount significantly affects the acceptance rate. Thus, the simple binary decision (accept or not) is unrelated to cognitive ability.

Our findings are basically the same as those of Oxoby and McLeish (2004), who found that the difference between SM and SD is not significant. When we drop offers above 1,000 JPY, the results are the same. Although the acceptance rate might be lower in SM than in SD, this possibility is not significant when the number of independent variables increases. Thus, acceptance behavior is the same. Our findings indicate that the result of Oxoby and McLeish (2004) is robust because we use adult participants, whereas they did not.

In terms of gender differences in ultimatum games, Solnick (2001) found that male receivers receive larger offers, especially from female senders. He also found that a male receiver accepts a smaller offer. On the contrary, our results indicate that gender differences do not affect sender or receiver behavior. This is true even when we drop the independent variables on cognitive ability and perform the regression analysis. From the perspective of age, sender behavior is mixed. The offer amount is not significantly different in young senders than in adult senders in our SD in line with the findings of Beadle et al. (2012), while the offer amount is higher for adult senders than young senders in line with results of Bailey et al. (2013). In terms of receiver behavior, the acceptance rate is not significantly different for young and old senders in line with the findings of Roalf et al. (2012).

6. Conclusion

In this study, we investigate the effect of cognitive ability measured by Raven's score on human behavior in experimental ultimatum games. We find that cognitive ability only affects sender behavior. Here, the relationship between Raven's score and the offer amount is quadratic and concave and this relation is robust. In particular, senders with upper middle cognitive ability offer the largest amounts. By contrast, receiver behavior is not affected by cognitive ability. As far as we know, these results are new findings and thus contribute to the body of knowledge on this topic. These results also provide an important perspective on rational and self-interested players as assumed by standard game theory. A sender with quite low cognitive ability will offer the closest to the sub-game perfect equilibrium, while one with quite high cognitive ability will offer 40% of the endowment and one with a middle level will offer closer to 50%.

However, although our results confirm that cognitive ability affects sender behavior, we cannot identify the relationship between cognitive ability and social preferences such as inequality aversion, altruism, and fear of rejection. Future studies should thus aim to conduct dictator game experiments to understand this (Engel, 2011). Comparing the results of ultimatum game and dictator game experiments would reveal the relationship between cognitive ability and these social preferences.

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Appendix: Experimental Instruction: SM Treatment

Thank you very much for participating in this experiment. Please read the instructions below. If you have a question, we will answer these later.

Please raise your hand if you find it difficult to understand the experiment. In this economic experiment, to collect data for the investigation of the results, it is necessary for all participants to understand the decisions they are making. Feel free to ask any question.

NOTICE

The experimental decision depends on the individual decision. Please follow these notices during the experiment:

- Do not speak to another participant. If you have a question, please ask the experimenters.
- Turn off your mobile phone/smartphone.
- Do not talk with the other participants during the experiment.
- Do not use a mobile phone.

Today's experiment is an ongoing project. Therefore, it is very problematic if other people know the information of the today's contents. Please follow the notices below:

- After the experiment is over, leave the experimental materials on the desk.
- Do not explain what you do in this experiment to other people.

Calculation of the monetary reward

The monetary reward consists of two parts. The first part is the participation fee (JPY 1,000). This is paid to all participants regardless of performance in the experiment. The second part is the performance payment. This depends on your and your pair's performances. After the experiment is over, you receive the sum of both parts. The performance payment ranges from JPY 0 to JPY 2,000.

The experiment

You have already been randomly assigned one of two roles (A or B). If your number is 1 to 14, your role is A; otherwise, your role is B. In the experiment, you are paired with the other role participant and make decisions on economic behavior. The decision-making is done through the computer console. Thus, you cannot know who your pair is.

In the experiment, you make decisions with experimental "POINTS". A "POINT" is equal to JPY 1 and we exchange your "POINTS" into JPY as your performance payment. The more "POINTS" you get, the more you are paid at the end of the experiment.

Decision-making of role A

- In the first stage, a participant of role A makes a decision.
- At the beginning of the first stage, he or she receives 2,000 "POINTS".
- He or she chooses how many "POINTS" to send to his or her role B. He or she chooses the amount of "POINTS" from 0, 200, 400, 600, 800, 1000, 1200, 1400, 1600, 1800, and 2000.
- The amount of "POINTS" he or she chooses is called "X."

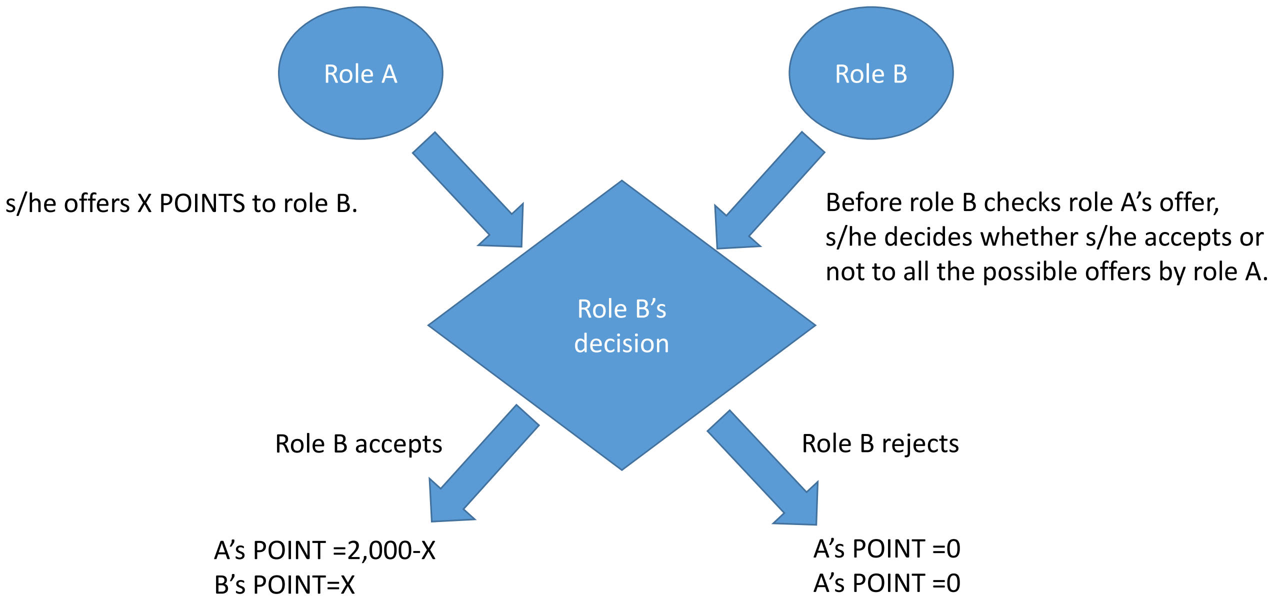
Decision-making of role B.

- Role B chooses to "accept" or "reject" all the possible amount of "POINTS" (in total, 11 "POINTS").

How to attain "POINTS"

- If Role B accepts the offer, Roles A and B attain 2000-X "POINTS" and X "POINTS," respectively.
- If Role B rejects the offer, both roles attain 0 "POINTS."

The below figure is a summary of the procedure



＜Example 1＞

- Role A offers 1,000 points to Role B.
- Role B accepts the offer.
- The "POINTS" both attain at the end of the experiment are

  Role A: 2,000-1,000=1,000 "POINTS"

  Role B: 1,000 "POINTS"

＜Example 2＞

- Role A offers 400 points to Role B.
- Role B rejects the offer.
- The "POINTS" both attain at the end of the experiment are

  Role A: 0 "POINTS"

Role B: 0 "POINTS"

The experiment is over after the above-mentioned decisions have been made. The amount of "POINTS" you have is exchanged into JPY. Your reward is the amount of "POINTS" and the participation fee (1,000 JPY) in total. Please notice the experiment is one shot. While we prepare the monetary reward for all participants, please answer some questionnaires and quizzes.