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Intelligence and Prosocial Behavior: Do Smart Children Really Act Nice?

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Abstract Results of previous studies of the relationship between prosocial behavior and intelligence have been inconsistent. This study attempts to distinguish the differences between several prosocial tasks, and explores the ways in which cognitive ability influences prosocial behavior. In Study One and Two, we reexamined the relationship between prosocial behavior and intelligence by employing a costly signaling theory with four games. The results revealed that the prosocial level of smarter children is higher than that of other children in more complicated tasks but not so in simple tasks. In Study Three, we tested the moderation effect of the average intelligence across classes, and the results did not show any group intelligence effect on the relationship between intelligence and prosocial behavior.

Keywords Prosocial behavior · Intelligence · Decision making

Evolutionary theory is based upon the survival of the fittest and the struggle for life (Axelrod and Hamilton 1981). Yet prosocial behavior is a form of behavior which often seems to benefit others, not necessary ourselves which is hard to explain in terms of evolutionary theory. Recent studies have found that cooperation strategies and other kinds of prosocial behavior may promote survival (Pennisi 2005; Clutton-Brock 2002). In addition, Flynn (1984, 1987) has suggested that the massive gain in Intelligence Quotient (IQ) in the US and another thirteen countries may be a function of the evolution of IQ. Both prosocial behavior and IQ might then be important features of evolution. The Question is: Are these two factors related to one another

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such that higher IQs engender more prosocial behaviour? Or simply speaking, would the smart guys act nice? This study addresses this question.

Prosocial Behavior and its Definition

Since the 1970s, as the movement of Positive psychology has grown along with researchers' interest in altruism and cooperation, prosocial behavior has become of increasing concern to a number of researchers. Different disciplines have preferred different names for 'prosocial' behavior, philanthropy in sociology, altruistism or cooperative behavior in comparative and socioeconomic psychology and prosocial behavior in developmental and social psychology. Cooperative behavior is one of the categories in prosocial behavior examined in this study. It is of interest because as a previous researcher has shown, altruistic behavior may not be driven by altruistic motives (Lewis 2002).

The definitions of "prosocial" behavior vary widely, yet all of them involve some common elements, such as values, goals, motives, and situations. According to Staub (1979), prosocial behavior is defined as behavior that benefits another and is intended to do so, including sharing, cooperation, helping, donation, and comforting, etcetera. A few studies on prosocial behavior have been concerned with its determinants both dispositional and situational (Batson and Powell 2003). Dispositional factors show the stability of prosocial behavior. They include personality, intelligence, autonomy, empathy, perspective-taking, moral reasoning, etcetera. Prosocial behaviors of an individual usually vary over time and across places, and the situational determinants are used to designate at least two kinds of influence (Eisenberg and Mussen 1989): (i) striking or unique events, and (ii) temporary external conditions and singular experiences or transient moods and emotion. In our study we focus upon intelligence, because of its role in the process of prosocial behavior.

Studies on the Relationship between Prosocial Behavior and Intelligence

Some studies have shown modest to moderate positive correlations (often .20 to .40) between measures of intelligence and prosocial behavior (Ma and Leung 1991; Weidman and Strayhorn 1992; Abroms and Gollin 1980; Krebs and Sturrup 1982; Zahn-Waxler and Radke-Yarrow 1982). Theories of mind, academic achievement and grade point average have also been linked to the presence of prosocial behavior (Caprara et al. 2000; Wentzel and Caldwell 1997; Zhao and Zhang 2004). However, some researchers have found no significant correlation between prosocial behavior and intelligence (Turner and Harris 1984; Jennings et al. 1987).

Eisenberg and Fabes (1998) suggested that intelligence may be linked to the quality of both children's motivation for prosocial behavior and the behavior itself. For example, Bar-Tal et al. (1985) found that intelligent fifth graders engaged in higher quality (more internally motivated), but not higher quantity prosocial behavior than their less intelligent peers. In their view this was because very few studies focused on the quality of the actual helping behavior of children varying in intelligence.

The qualities of prosocial behavior involve such factors as types, motives, and specific situations. For example, Hartshorne et al. (1929) found that correlations of prosocial behaviors was rather weak (r=0.23) in different situations (for example, helping children in hospital to find stories and pictures, donating to charities, providing gifts to needy children) with the 10,000 middle and primary school students as participants. To solve the problem, we applied our study to the several types of prosocial contexts. It is worth noting that Carlo and Randall (2002) found that perspective taking was positively related to altruistic prosocial behavior, dire prosocial behavior, emotional prosocial behavior, compliant behavior, while negatively correlated with public prosocial behavior.

Millet and Dewitte (2007) suggested that the altruistic behavior might serve as a costly signal of general intelligence, which means that smart individuals use costly altruistic behavior to convey information about themselves. According to costly signaling theory (McNamara 2007), a signal is defined as a behavior, expression, or phenotype produced by one individual (the signaler) that aims to influence the behavior of a second individual (the receiver). Millet and Dewitte in their study (2007) adopted the 'repeated public goods game' as their method of measuring altruistic behavior.

According to their contributed share in the games, participants were divided into three groups: egoistic, cooperative, and altruistic. Millet and Dewitte found that the altruists performed better than cooperators and egoists in the RPM (Raven Advanced Progressive Matrices IQ-test) and CRT (four choice reaction time task), no difference between cooperators and egoists, and no effect emerged for SRT (a simple reaction time task). They explained their results as follows: Intelligent individuals can acquire resources more easily, thus they can donate part of their resources at less cost. However, the previously inconsistent findings of relationship between intelligence and prosocial behavior do not support this theory. The costly signal of prosocial behavior was not a necessary component for smart people to show themselves, but good academic achievement of children and high salary of adults may be better predictors.

But why did the correlation between intelligence and prosocial behavior not show up in other parts of their studies? The different prosocial behaviors emerging in different situations may need different cognitive capabilities, especially in the steps of encoding of external and internal cues, and response access or construction. Individuals should have the capacity for recognition and interpretation of others' needs, and possess the ability to find and evaluate the outcomes.

Crick and Dodge's social information processing theory (1994) provided a detailed model to determine how children interpret and process stimuli in the present situation. The theory demanded that children's social behavior requires corresponding cognitive skills, such as attention, memory, and reasoning. An adequate processing of social cues will enhance social adaptation, while inadequate processing will lead to negative social behavior (such as aggressive behavior). In their reformulated social information processing model, Crick and Dodge (1994) claimed the processing steps include: (1) encoding of external and internal cues, (2) interpretation and mental representation of those cues, (3) clarification or selection of a goal, (4) response access or construction, (5) response decision, (6) behavioral enactment. In line with the social information processing theory, Eisenberg and Mussen (1989) interpreted the effect of cognition on the prosocial behavior as follows:

> *We have to perceive and interpret a situation and make inferences about theirs' feelings. We also evaluate their needs and desires and decide which actions will be most effective and beneficial to them. Finally, we must formulate and execute a plan for prosocial action. In short, prosocial action involves several fundamental cognitive processes: perception, reasoning, problem solving, and decision making. (p. 108)*

It is reasonable to expect that the quality of prosocial behavior will influence the relationship between intelligence and prosocial behavior such that higher quality prosocial behavior will likely be seen in more highly intelligent people. Maybe in easy tasks, there will be no difference among groups of different intelligence levels, however, the obvious difference will be found in the difficult tasks where greater demands are made upon cognitive processing.

Group Intelligence Level Effect on the Relationship between Intelligence and Prosocial Behavior

Most previous studies focused on relationships between intelligence and prosocial behavior at the individual-level, while there's little or no analysis of the group effect on this relationship. Lando and Schneider (1997) found that intellectually-gifted children in homogeneous groups (special programs for gifted children) exchanged constructive knowledge and prosocial feedback more frequently than the gifted children in heterogeneously mixed groups (regular school).

As Lovecky (1997) and Silverman (1994) suggested, the gifted children were more concerned with fairness and justice, and with emotional feeling of others, while in homogenous groups but they could not be understood in heterogeneous groups. As they were alienated, they could be easily hurt because of high emotional sensitivity (Rest 1986) which would result in less mixing with others (such as, prosocial behavior). As they can understand and be understood in the homogeneous groups, they will extend and challenge their ideas without having their respective contributions negatively reinforced (Lando and Schneider 1997).

The above studies suggest the possibility of a group effect on the relationship between prosocial behavior and intelligence. Therefore, in the third study we will examine the possibility that the group's intellectual level can strengthen the positive relationship between prosocial behavior and intelligence.

Study One

In the first study, we reexamined the costly signaling theory in the relationship between intelligence and prosocial behavior.

Hypothesis One: Individuals of higher intelligence level do not act more prosocially than individuals of lower intelligence level in the public goods game.

Method

131 participants in a primary school of Beijing (Male: 64; Female: 65, M age=10.66, SD=1.56) participated in the study. The data from 2 participants (1 boy and 1 girl) were discarded because they could not finish all the games.

Measures

Intelligence was measured within a class time period using the test of Nonverbal Intelligence, TONT-2. The Chinese version of TONT-2 has been found to have good reliability and validity (Zhang et al. 2003). The correlation between TONT-2 and Raven Advanced Progressive Matrices IQ-test (RPM) (Chinese Version) is .65 (Liu et al. 2003).

Approaches to Prosocial Behavior of Children

Prosocial behavior is an infrequently occurring act carried out over short periods of time and does not happen routinely. This makes it hard to study (Radke-Yarrow et al. 1983). While there are a few ways to deal with such difficulties, such as natural observation, retrospective reports, game settings, hypothetical dilemmas, etcetera, different methods address somewhat different questions and tend to be used on children of certain ages.

All of these studies have limitations (Penner et al. 2005; Eisenberg et al. 2006; Eisenberg and Fabes 1998). For instance, the application of natural observation avoids demand characteristics, social desirability, evaluation apprehension, etcetera, while it is hard to effectively control independent and extraneous variables. The self- or other-rating method in assessment is easy to be conducted, but it is more appropriate for the measurement of prosocial value orientation rather than prosocial behavior in a specific situation. Some critics have commented that it is too abstract a concept although it has wide applicability. The research technique of eliciting free responses to hypothetical questions is frequently employed in this field (Radke-Yarrow et al. 1983), but this method does not involve examining actual prosocial behavior. Therefore, we used games with material incentives in order to produce meaningful responses from participants.

A game is a purely imaginary idealization of a social interaction (Colman 1982). Because of the complications involved in measuring the transient nature of actual social interactions, an increasing number of the researchers have adopted the method of the experimental game, which basically involves three main elements: players, strategies, and payoffs. One practical and feasible game involves important details corresponding to the reality of social interaction, and yields insights comparable to interdependent decision-making.

The public goods game, involving more than two players, is collectively beneficial, and the free riders achieve more than the cooperators. As the participants were assigned to separate computers, they were instructed that they would play with five other anonymous children in another room, who were strangers and would never meet again. In reality, they were playing against the computer.

They then imagined a magic table, which could increase the total number of objects on it by as much as five times. For example, if one cup (dollar) is put on the table, five cups (dollars) would appear. Once the cups were put on the table, they became public goods, and were allocated equally among the group of six children. Everybody got ten tokens and could decide the number of tokens to put on the table. They were informed that they were to exchange the tokens for a gift after the game.

Results and Discussion

According to the scores on the intelligence test, the participants were divided into three groups, that is, high, average, and low intelligence (See Table 1). A two-way factorial ANOVA (intelligence levels: IQ≥120; 120>IQ>100; IQ≤100) showed that there was no significant difference between the groups in terms of how prosocially they acted in the public goods game.

The results of this study support our first hypothesis that individuals of higher intelligence level do not act more prosocially than individuals of lower intelligence level in the public goods game. But why were the results not consistent with those in the Millet and Dewitte's study?

The results are not in line with the prediction from the costly signaling theory. One possible reason may be that the public goods game of our study is somewhat simpler than their game. In the simpler game, individuals need less cognitive capability to process relevant information, thus, no difference between groups occurs. Another possible reason may be that the public goods game is not a purely altruistic game. The public goods game is a reciprocating game with an expectation of cooperation. Public goods are equally available to all group members regardless of their level of contribution to the group (Bornstein 1992), and are things that people have to expend time, effort, and money to provide, but once they are provided, others cannot readily be excluded from benefiting from them even if they do not contribute to their provision (Barclay 2006; Davis and Holt 1993). If the total number provided cannot reach certain amount, the proposer receives less tokens than they have paid for.

A public goods game, especial a repeated one (with some feedback), is a somewhat cooperative, sharing game. Even if the results were divided into altruistic, cooperative and egoistic games, it is still hard to confirm the motivation of participants from whether or not they want to receive more awards from their mutual contribution or they just expect joint benefits.

Table 1 Means and standard deviations on offers of public goods game for each intelligence level

Game	Intelligence					
	High		Average		Low	
	No.	*M*±*SD*	No.	*M*±*SD*	No.	*M*±*SD*
Public Goods Game	12	7.75±2.77	84	6.81±3.39	34	6.65±3.58

In Study Two, we adopted a relatively altruistic game, called a dictator game. For distinguishing the levels of task complexity, we adopted an ultimatum game, and one involving a role-change.

Study Two

In Study One, we replicated the Millet and Diwitte experiment, and our results did not support the signaling cost theory. In Study Two, we explored the possibility of the task effect in the relationship between prosocial behavior and intelligence. According to social information processing theory, children's social behavior requires corresponding cognitive skills, such as attention, memory, and reasoning. It may be expected that the more complicated the task, the higher the level of prosocial behavior emanating from more intelligent individuals.

Hypothesis Two: For the simple task (the dictator game) the level of prosocial behavior will not significantly differ between the groups of different intelligence level.

Hypothesis Three: For the ultimatum and role changing games (complex tasks) the amount of prosocial behavior of the higher intelligence group will be higher than that of average and below average intelligence level groups.

Method

1220 volunteers in primary schools in Beijing (Male: 761; Female: 459, M age= 10.22, SD=.57) participated in these two studies. The data from two additional participants were discarded due to a failure to complete the intelligence test.

Measures

All the participants undertook Cattell's Culture Fair Test (CCFT, Children version). CCTF was used to obtain IQ scores. This test has been found to be a good predictor of fluid intelligence and typically loads highly on the general factor of intelligence (Liu 2004; Engle et al. 1999; Conway et al. 2002). The test-test reliability is 0.66 (Zheng 1995). The correlation between CCTF and Raven Advanced Progressive Matrices IQ-test (RPM) (Chinese Version) is .71 (Liu et al. 2003). The z-scores of the test were applied in this study for comparison of different age groups.

We chose all three games in the pilot study, that is, the dictator, ultimatum and role-change game.

The dictator game (DG) is an allocation task and a purely altruistic game, which consists of a participant making an anonymous allocation to a partner (the recipient) from an initial fund. It has been viewed as a close approximation to true sharing or sacrificial caring (Camerer 2003). The participant is the active player who makes the decision as to how to allocate the pie, and the recipient is the passive player who can only accept the outcome.

The ultimatum game (UG) is also an allocation task like the dictator game, except that the recipients have the ability to reject what is allocated to them and can punish their proposers who might be unfair to them by sacrificing their own money. When the active player proposes a division of the pie to the passive player, both players receive nothing (Bolton et al. 1998), if the recipient rejects the offer. In comparing the above two games, the recipients are more powerful in the latter (Han et al. 2009). In laboratory studies, it has been found that participants tend to offer significantly higher amounts in the ultimatum game than in the dictator game.

The Role-change game is a decision-making task in which the players and recipients swap roles (Bornstein and Yaniv 1998). They decide to what degree they will accept the offers provided by their partners. If the proposers offer less than the recipients demand and the recipients reject the offer, both of them obtain nothing. The more the recipients demand, the less the prosocial (cooperative) behavior they perform.

Results and Discussion

When the participants were divided into three parts according to their z-scores, the number of the individuals of low intelligence was 40 (below -1.5 z-scores of CCFT), of average intelligence 1099 (ranged from -1.5 to 1.5 z-scores of CCFT), of high intelligence 80 (above +1.5 z-scores of CCFT).

For the balancing of participants among the three groups of different intelligence level, we randomly selected 120 from the average intelligence group of 1099 individuals. A Two-way repeated ANOVA (Intelligence level: low, normal, high) * 3 (Game: DG, UG, Role-change Game) was conducted to test the present two hypotheses. Similar to the above result, the analysis still revealed a significant interactive effect ($F=5.024$, $p<.01$) and a main effect for games ($F=33.177$, $p<.001$). These further results indicate that there is no significant difference amongst the three intelligence groups in the DG and UG. While in the role change Game, the individuals of higher intelligence (mean=3.15) required less token than the individuals of average (mean=3.86) ($t=.03$, $p<.05$) and lower intelligence (mean=4.80) ($t=.04$, $p<.00$). The individuals of average intelligence demanded less than those in the group of lower intelligence ($t=.04$, $p<.05$). There were no other significant differences in this study Table 2.

These results support Hypothesis Two and partially support Hypothesis Three that the effect of intelligence levels on prosocial behavior varies in the different tasks. In the relatively simple game, there is no difference among three intelligence groups,

Table 2 Descriptive statistics of the three games for each intelligence level

Game	Intelligence					
	High		Average		Low	
	No.	*M*±*SD*	No.	*M*±*SD*	No.	*M*±*SD*
Dictator Game	80	5.25±.20	120	5.00±.18	40	4.90±.22
Ultimatum Game	80	5.73±.18	120	5.64±.15	40	5.23±.19
Role-change of UG	80	3.15±.18	120	3.86±.19	40	4.80±.26

and in the rather complex game, the higher intelligence individuals performed more prosocially. The effect did not occur in the ultimatum game. Some researchers have suggested that the ultimatum game is too simple (Camerer and Thaler 1995), which may be the reason why there was no difference among the higher, average and lower intelligence groups.

Study Three

In Study Two, we found the different intelligence effect on the results of three games. In the simple games (dictator game and ultimatum game), there was no difference among the groups of three intelligence level. In the complex game (role change game), the groups of higher intelligence were more prosocial than the other two groups. It is reasonable to expect that if the smarter children in the real world would be more prosocial because of the complication of the real world. Peer nominated prosocial behavior is a kind of assessment through observing and direct interaction, which has been viewed as important method to psychological measurement. In addition, the homogeneous group, as mentioned above, may allow the smart children to be prosocial, so we will examine that the class's intelligence level can influence the relationship between intelligence and prosocial behavior.

Hypothesis Four: The level of intelligence can positively affect the peer nominated prosocial behavior.

Hypothesis Five: The class average intelligence level will influence the relationship between intelligence and prosocial behavior. The higher the average intelligence of the class, the more it will strengthen the relationship between intelligence and prosocial behavior, while the lower the level the more it will reduce the relationship.

Method

910 volunteers from 24 classes in Grade Five, Six, Seven and Eight of a primary school and a middle school of Beijing (Male: 761; Female: 459, Mean age=13.05, SD=1.40) participated in this study. The mean ages of children were 10.73 years, 11.68 years, 12.73 years and 13.74 years (*SD*=.37, .35, .37 and .45, respectively) at Grade Five, Six, Seven and Eight respectively. In order to cover the large range of students' intelligence, these two schools are both ordinary schools.

Measures

All the participants of this study also undertook Cattell's Culture Fair Test (CCFT, Children version) to obtain IQ scores (Liu 2004; Engle et al. 1999; Conway et al. 2002). The z-scores of the test were obtained for every student, and the average intellectual level of each class is the average score of the sum of students' z-scores in every class.

The peer nomination was used to measure social behavior and included three scales: prosocial behavior (five items), overt aggression (five items), and relational aggression (four items) (Crick 1995; Crick and Grotpeter 1995; Crick and Werner 1998). We adopted the subscale of prosocial behavior in this study. During the measurement, children were required to nominate three classmates best fitting the behavioral descriptions of each item. High internal consistency and test-retest reliability and good construct validity of this measurement was found in the previous researches (Crick and Werner 1998).

Results and Discussion

The correlation coefficients of the within-class variables was 0.131 between IQ and peer nominated prosocial behavior. To account for the class-level (group-level) variations, we used hierarchical linear modeling (HLM, Chang 2003) to conduct the two-level HLM analysis reported next.

Average within-group relations between individual prosocial behavior and individual IQ are presented in the Table 3. The result of individual level was obtained from random effect regression with HLM. The results indicated that individual prosocial behavior was positively associated with IQ.

The Table 3 also provides the information about class variation of the regression effect. The chi-square test in the Table 3 reports the result of statistical test for class variation in the regression. The effect of IQ on prosocial behavior was not significantly different across classes, which suggests that the same effect of IQ on prosocial behavior existed in all classes. That is, independent of the group intelligence, children with higher intelligence level were consistently prosocial.

The result at the individual level is consistent with the results of Study Two in which IQ was the predictor of peer nominated prosocial behavior. The peer nomination is a relatively objective assessment of social behavior which based on classmate's observation and judgment of students' ordinary behavior. This method can avoid the effect of social approval bias and the situational determinants (such as participants' present emotion) as well. The same results verify our hypothesis of a relationship between prosocial behavior and IQ at the individual level once again.

At the group level, we found there was no group difference among 24 classes, which means that the group level of intelligence cannot influence the positive relation between IQ and prosocial behavior. This result, contrary to the Hypothesis Five, indicated that the smarter students performed more prosocial act than other students in all classrooms, no matter what the group intelligence was. The main reason could be the scarcity of gifted children in each class from the ordinary schools, although there's evidence that gifted children are more prosocial in homogeneous groups (Lando and Schneider 1997; Silverman 1994). That is to say, at least for most

Table 3 Relations between intelligence and prosocial behavior at the within-Group individual level (β_{1j})

	Regression coefficients and statistical tests			Variance components and statistical tests	
	Coefficients	*SE*	*t* test	Variance component	Chi square
Intelligence	0.1306	0.0274	4.764***	0.00003	1.8808

*** p<.001

students, the group intelligence would not influence the relations between their IQ and prosocial behavior.

General Conclusion and Discussion

This study attempted to explore the relationship between intelligence and prosocial behavior in social dilemmas and sought to find a better way of interpreting the relationship. In line with the public goods game, there was no difference among the three groups in the dictator game. DG is a relatively altruistic game and involves only a simple allocation task, in which the proposers just choose any percentage of tokens to allot to their partners without any pressure. Whatever percentage they provide, there will be no negative consequence.

Compared with the public goods game, the dictator game is a better game for eliciting altruistic behavior. The results from the public goods and the dictator games do not support the costly signaling theory, which means it is not necessary for the prosocial people to be smart.

In the second study, we found the complexity of games was an important variable, in line with our hypothesis. In the dictator game, the participants were instructed to allocate tokens. In the ultimatum game, the participants also allocated tokens, but their allocation could be accepted or rejected by the recipients. Finally, in the role change game, the participants were the recipients of the previous ultimatum game.

Analyzing the three games, we found there was always one more step in each subsequent game. The Ultimatum Game involved a task which added a condition to the Dictator Game; the role change Game added a step to the Ultimatum Game. The results showed that the smarter people were more prosocial in the more complicated game. The possible reasons for these findings may be that the participants could perceive more prosocial ‘information’ than less intelligent participants and thus make better decisions. Similar results were found in Bender and Carlson’s study (1982). In simple tasks there was no difference in perspective-taking, empathy or in prosocial behavior among the non-retarded children, the educable mentally retarded children and the trainable mentally retarded children.

Another possible explanation is that smarter people are more rational than people of average and lower intelligence when swapping roles in the ultimatum game. According to predictions from game-theory (Bornstein and Yaniv 1998) in ultimatum games and those involving a role-change, the more rational players are concerned with maximizing their own profit, which means that as proposers they keep almost all the tokens and give very few to the recipients who seem to accept every positive offer no matter how small.

Bornstein and Yaniv (1998) found that groups are more rational than individuals who offer and accept less. They assumed that some individuals cannot grasp the strategic structure of the game, while groups can tackle the game better. In our study, smarter individuals were more rational than individuals of average and lower levels in the ultimatum game involving a swapping of roles. However, no differences in dictator and simple ultimatum games emerged.

Undoubtedly, different strategies can be applied by different participants in these games but the results nonetheless can be taken to represent in a simple way differing levels of prosocial behavior. Consistent with real life, even though we cannot determine the level of motivation and other internal processes of prosocial behavior, it can easily be seen that overt performance may benefit others.

Our study has revealed that there is a contradiction in the outcome of these games: the more rational, the less prosocial the behaviour in dictator and ultimatum games; the more rational, the more prosocial the behaviour in ultimatum games involving a swapping of role. Smarter individuals prefer to be prosocial rather than rational in dictator and ultimatum games; at least, there's no significant difference of prosocial behavior between smart and other individuals. With the same tendency between prosocial and rational in the role change game, smart individuals significantly perform more prosocial behavior. That is to say, smarter individual tradeoff between rational and prosocial factors in different situations (smarter people deal with more information in decision making). There was no effect of average class intelligence in the study however, which means the constant relation between IQ and prosocial behavior across the groups of different intelligence level.

In summary, the relationship between intelligence and prosocial behavior is not a linear correlation but depends upon the situation. Further studies could explore the effects of the combination of experience and situations, which has been considered as a better predictor of social behavior (Crick and Dodge 1994), and the reaction time of decision making in every game can also be taken into consideration.

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