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## THE RELATIONSHIP BETWEEN THEORY OF MIND, EMOTIONAL INTELLIGENCE, AND SOCIAL INFORMATION PROCESSING WITH PROSOCIAL BEHAVIOR IN ELEMENTARY SCHOOL STUDENTS

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### ABSTRACT

The purpose of the present study was examining the relationship between theory of mind, emotional intelligence, and social information processing with prosocial behavior in elementary school students in Zanjan. To this purpose 380 students has been selected with using multi-stage random sampling. The research instruments were: Theory of mind questionnaire, Schutte Self Report Emotional Intelligence Test, social information processing questionnaire and Child Behavior Scale. The results showed the positive and significant relationship between theory of mind, social information processing, emotional intelligence and prosocial behavior. Also multiple regression analysis showed that 76 percent of prosocial behavior variance are predicted with predicted variables.

**Keywords:** *Theory of mind, Social Information Processing, Emotional Intelligence, Prosocial Behavior.*

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### Introduction

Prosocial behaviors have been the subject of different area of psychology and researchers based on their orientation have always tried to investigate situational, cognitive and emotional factors in the occurrence of such behavior (Penner, Dovidio, Piliavin and Schroeder, 2005). Prosocial behavior is in contradiction with anti-social behavior such violence, aggression and malicious actions (Knickerbocker, 2003). Prosocial knowledge is recognition people on how they behave in interpersonal relations rather technical knowledge of facts and principles (Martin-Raugh, Kell and Motowidlo, 2016). In fact, it's the behavior related to the welfare of others, but also in some cases it can be motivated by selfish behavior (unmoral) (Carlo and Randall, 2000). It has no direct benefit for the subjects and even may contain risks to them (Baron, Byrne and Branscombe, 2006). Types of prosocial behavior are: Altruistic prosocial behavior, Compliant prosocial behavior, Emotional prosocial behavior, Public prosocial behavior (Carlo and Randall, 2002). Children with prosocial behavior would have tendency for procreator and suitable social skills and low level of negative emotions (Eisenberg, Fabes, Karbon, Murphy and Wosinski, 1996). As students enter the teenage stage from childhood, they would be dependent to social relationships with their Peers (Kidron and Fleischman, 2006). Teenagers who are close friends with each other, are more likely to engage in such behavior (Barry and Wentzel, 2006). One of related factors with prosocial behavior is, theory of mind (TOM). Researchers have shown understanding one's own thoughts and emotions, understanding the thoughts and emotions of others as well as compassion, empathy and motivation facilitates prosocial behavior (Eggum et al, 2012). Theory of mind is making reaction to the content of your mind and others (Kaysili and Acarlar, 2011). During the early years of school, children's theory of mind becomes more advanced and the mind acts as an active information processor in thinking (Wellman, Cross and Watson, 2011). Evidence has shown that talking about mind is an important factor in determining of individual differences in theory of mind (Bianco, Lecce and Benerjee, 2015). Emotional intelligence (EI), is related to empathy and also empathy is related to prosocial behavior, so EI is also associated with prosocial behavior (Charbonneau and Nicole, 2002). Goleman (1998), defines emotional intelligence as the ability to manage and control one own behavior in dealing with others. As well as it is the ability to recognize and respond to the own and others emotions in the social interaction context. However, EI is not a single concept with two major natures as a form of intelligence or a personality trait (Petrides and Furnham, 2003). Researches have been shown that people with great efficiency could improve their emotional

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intelligence level. This process initiates with the development of self-awareness through the understanding thoughts and feelings about people and different situations. When they achieve a level of self-awareness they likely move to understand the others feelings and use the obtained information to provide an appropriate response to others (Diggins, 2004). Researches have shown there is a significant positive relationship between prosocial behavior and goals of social information processing (SIP). Social information processing theory is about how children making decisions in social interactions (Crick and Dodge, 1994). Crick and Dodge (1994) have proposed a model called the social information processing based on it when children see themselves in social situations and when faced with a difficult situation at first encode information and interpret social clues then make the information available to their cognitive treasury, according to it decide and evaluate possible responses to a given situation and finally make their decision and act based on the selected response (Burgess, Wojslawowicz, Rubin, Rose-Krasnor and Booth-LaForce, 2006). SIP is a mechanism for, encoding, acquiring and retrieval of social data that improves people's social behavior (Bennet, Farrington and Huesmann, 2005). SIP model in addition of explaining successful social interaction of children, also has various applications in order to identifying the causes and prevention of behavioral problems in children and teenagers (Li, Fraser and Wike, 2013).

## Method

### Subjects and procedure

Participants were all sixth grade elementary students in Zanjan city, Iran, who attend school in the academic year 2016-2017. The population was 30,000 people, according to Morgan table; 380 (202 girls, 178 boys) students selected with using multi-stage random sampling and completed questionnaires. Also, teachers completed prosocial behavior questionnaires for each student

## Materials

### Theory of Mind Test

The original form of this test has 78 questions was developed by Steerneman (1994, quoted by Morris et al., 1999) to assess the theory of mind in normal 5 to 12 years children and children with pervasive developmental disorders and provides information about social understanding, children sensitivity and insight, as well as the degree of their ability to accept the others feelings and thoughts.

In this study, we used 38-question form of theory of mind which Ghamarani, Alborzi and Khayer (2006) had been used on normal group of students in Shiraz. The test has three sub-scales, (a) precursors of theory of mind (TOM 1; 20 items), (b) first manifestations of a real theory of mind (TOM2; 13 items), and (c) more advanced aspects of theory of mind (TOM 3; 5 items). This test is administered individually and it is including images and stories which a tester after providing them the subject, makes questions to ask. Considered for the correct answer score one and a zero score for wrong answers. In the present study, the validity of the total test and each subtest level of theory of mind first, second and third, respectively were, 0.71, 0.66, 0.51 and 0.85.

### The Schutte Self Report Emotional Intelligence Test

This test is a 33 item self-report measure of emotional intelligence developed by Schutte et al. (1998). The SREIS has been designed to map onto the Salovey and Mayer (1990) model of EI. Three components questions of emotional intelligence construction measures appraisal and expression of emotion (13 items), regulation of emotion (10 items) and utilisation of emotion (10 items). In this study, reliability for total test and subscales and expression of emotion, the emotion exploitation and emotion regulation, respectively were Calculated, 0.84, 0.66, 0.74 and 0.73.

### Social Information Processing Skills

Different scales have been used to measure social information processing skills as part of the data collection, which evaluated the social purposes in the present study. An example of these images with explanation was "A day in the school you're doing work on research projects with other friend, almost when you've finished half of your work, your friend says "I do not like your job" and throws your all work" (Crick and Werner, 1998). The main scale includes seven purposes. Because Dliveaux and Daniels have reported low correlation of the efficiency and overlap variables with other objectives, the goal of avoiding trouble (i.e., stay away from trouble with powerful figures), to maintaining equality (i.e., work with a mutually agreed solution), were not evaluated in the current study. So children evaluated five goals for each story that they are: To pursuing self-interests (trying to re-acquire the target), having personal control (do not let classmates to bullying), revenge (reprise classmates act), maintaining the relationship with classmates (trying to keep up with classmates) and maintaining relationships with other groups (make sure the other classmates like him). Students on a 5-point scale from one (strongly disagree) to five (strongly agree) determined how much they have tendency to happen any purpose. The average score for each goal is between one to five. Delveux and Daniels (2000), Cronbach's alpha for internal consistency was in the range of 0.84 up to 0.96. In Martins' study (2010), Cronbach's alpha was 0.85 and 0.79 for the purposes of revenge and peace. In terms of the validity of the measures it shows communication of predictable methods in the choice of solutions (i.e., it predicts the purpose of revenge, physical aggression stems). (Delveaux and Daniels, 2000). Reliability of SIP questionnaire and subscales of self-interests maintaining, personal control, revenge, relations with peers, relations with group, respectively were, 0.65, 0.64, 0.66, 0.76, 0.63 and 0.70.

### Child Behavior Scale

The Child Behavior Scale (Ladd and Profilet, 1996), was used to measure aggression, withdrawn and prosocial behavior in children. The present study is only about prosocial behavior which included eight items were assessed by the teacher. Teacher's child behavior evaluation form was adapted from the Achenbach's child behavior scale. The average score of each person varies between 0 to 16. The higher score, indicates the more prosocial behavior. According to Ladd and Profilet (1996), there is a significant correlation between the two scales with aggressive behavior (Prosocial with Peers,  $r = -.19$ ,  $p < .01$ ; Aggressive with Peers  $r = .39$ ,  $p < .001$ ) and prosocial behavior (Prosocial  $r = .23$ ,  $p < .01$ ; Aggressive  $r = -.19$ ,  $p < .01$ ) during free play periods at school, and with aggression (Prosocial  $r = -.45$ ,  $p < .001$ ; Aggressive  $r = .71$ ,  $p < .001$ ) and withdrawal (Prosocial  $r = -.35$ ,  $p < .001$ ; Aggressive  $r = .08$ , ns) scores on the Teacher Report Form, the teacher version of Achenbach's Child Behavior Checklist.

In the present study, in term of reliability of Child Behavior Scale, Cronbach's alpha of studied samples was obtained 0.92 which is satisfactory.

**Results**

Descriptive statistics and results of correlation coefficient between study variables is shown in table 1.

**Table 1:** Correlation between TOM, EI, SPI and prosocial behavior

	M	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1.Theory of mind 1	16.01	3	1											
2. Theory of mind2	9.97	2.51	0.19**	1										
3. Theory of mind3	0.54	1.22	0.05	0.101*	1									
4.self interest	13.18	2.94	0.06	0.004	.000	1								
5.personal control	12.04	3.38	0.26**	.457**	.062	.035	1							
6.relationship with peer	12.72	3.34	0.26**	.461**	-.041	.072	.530**	1						
7.relationship with group	12.33	3.53	0.29**	.577**	.111*	.013	.664**	.677**	1					
8.revenge	8.49	4.13	-0.02	-.123*	.128*	.010	.091	-.141**	.036	1				
9. regulation of emotion	36.69	6.54	0.22**	.479**	.032	.022	.449**	.466**	.607**	-0.026	1			
10. appraisal and expression of emotion	40.03	8.11	0.21**	.489**	.103*	-.020	.506**	.526**	.637**	-.007	.729**	1		
11. utilisation of emotion	34.22	7.49	0.27**	.608**	-.003	-.019	.503**	.557**	.681**	-.108*	.620**	.688**	1	
12.prosocial behavior	12.48	4.13	0.34**	.594**	.059	.012	.703**	.759**	.897**	.013	.630**	.666**	.702**	1

As shown in Table 1, all the predictor variables have significant relationship with prosocial behavior except personal interests, revenge, and the TOM3. The correlation between self-interest and prosocial behavior ( $r=0.01$ ) between maintaining personal control and prosocial behavior ( $r=0.70$ ) between revenge and prosocial behavior ( $r=0.01$ ) Between relations with peer and prosocial behavior ( $0.76$ ), between relationship with group and prosocial behavior ( $r=0.89$ ), Between regulation of emotion and prosocial behavior ( $0.63$ ), between appraisal and expression of emotion and prosocial behavior ( $r=0.67$ ), utilisation of emotion and prosocial behavior ( $r=0.70$ ), between TOM1 and prosocial behavior( $r=0.33$ ), between the TOM2 and prosocial behavior, ( $r=0.59$ ), and finally between the TOM3 and prosocial behavior ( $r=0.59$ ) which all except the TOM3, revenge and personal interest were significant at ( $p=0.01$ ) To investigate the role of predictive role of theory of mind, emotional intelligence and social information processing in the dependent variable stepwise regression analysis was used that the results of this analysis are presented in Table 2. Table 2 shows the predictive role of mentioned factors in the prosocial behavior.

**Table 2:** Multiple regression analysis of theory of mind, emotional intelligence, social information process and prosocial behavior

Predictor	R <sup>2</sup>	Adjusted R <sup>2</sup>	B	β	F	t
Model 1	.804	.804			1.555E3	
Relationship with group			1.050	.897		39.427
Model 2	.847	.846			1.044E3	
Relationship with group			.827	.707		
Relationship with peer			.347	.281		
Model 3	.860	.859			770.839	
Relationship with group			.725	.620		
Relationship with peer			.318	.257		
Personal control			.189	.155		
Model 4	.867	.865			609.685	.867
Relationship with group			.665	.568		
Relationship with peer			.307	.248		
Personal control			.180	.148		
Regulation of Emotion			.065	.103		
Model 5	.870	.868			500.281	
Relationship with group			.629	.039		
Relationship with peer			.292	.032		

Personal control			.176	.031		
Regulation of Emotion			.048	.016		
Utilisation of Emotion			.046	.015		
Model 6	.872	.870			422.051	.872
Relationship with group			.624	.543		
Relationship with peer			.288	.233		
Personal control			.170	.140		
Regulation of Emotion			.048	.076		
Utilisation of Emotion			.044	.080		
TOM 1			.060	.043		

As shown in Table 2, based on the results of multiple regression analysis and by stage method, multiple correlation ratio for the linear combination variables, of theory of mind, emotional intelligence and social information processing and prosocial behavior was  $MR=0/93$  and  $RS=0.87$  which is significant at  $P<0/01$ . Regarding to the obtained correlation coefficients, it is defined that about 87% of the variance of prosocial behavior variable are specified by predictor variables. Also, all three variables of social information processing, emotional intelligence and theory of mind are essential to predict prosocial behavior. But regarding to the values of the regression coefficients in terms of the potency of prediction, relationship with the group was  $\beta =0.90$  ( $P=0.01$ ), relationship with peers  $\beta =0.28$  ( $P=0.01$ ) and personal control  $\beta =0.15$  ( $P=0.01$ ), regulation of emotion  $\beta =0.10$  ( $P=0.01$ ), utilisation of emotion  $\beta =0.08$  ( $P=0.01$ ), TOM1  $\beta =0.04$  ( $P=0.01$ ), have more prediction power.

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### Discussion and Conclusion

Aim of this study was investigating the relationship of theory of mind, emotional intelligence and social information processing with prosocial behavior. As the results showed, estimated correlation coefficients between all three variables theory of mind, emotional intelligence and social information processing with prosocial behavior were significant. In general we can say whatever score of theory of mind, emotional intelligence and social information process is higher, children show more prosocial behavior. The results are consistent with previous research.

For example, Renouf et.al (2010) showed children who exhibit less aggression, have more ability of theory of mind. To explain these findings, we can say, researches have shown that understanding one's own thoughts and emotions, facilitates understanding thoughts and emotions of others. So it increases the capacity of empathy, sympathy and prosocial behavior (Feshbach, 1987, quoted Eggum et al., 2012). People who have tendency to understand others emotion are expected having more advantage due to their level of moral reasoning and show empathy tendencies to help the others (Eisenberg, Spinrad and Sadovsky, 2006). When people participate in social interaction they infer mental states of others and realize the underlying motivations of others behavior and predict next behavior then based on it they form their behavior and attitudes (Astington, 2003). If children would not understand false belief they Cannot understand that others can have the social conditions that are contrary to them. Sharing behaviors needs to understand the others mental states however, participating in society is a social norm that children have more opportunities to get it. Helping, peace and cooperation are significantly related to children's theory of mind. Overall, this correlation supported the suggestion which prosocial actions are built based on expanding sensitivity to the others views (Dunfield, 2015). Deep relationship of the theory of mind and correlation is based on the fact that unlike other forms of prosocial behavior, correlation need to continuous interpretation of social emotional symbols and one's own wills control to maintain it, In addition, correlation provides a visible interpersonal interaction feedback that facilitates the development of children's theory of mind (Imutsa, Henry, Slaughter, Selcuk and Ruffman, 2016). Prosocial children, have more opportunity for experience and they view emotional benefits of these actions for themselves and oth-

ers (Van Duijvenvoorde, Zanolie, Rombouts, Raijmakers and Crone, 2008). The relationship between social information processing and prosocial behavior was also positive and significant. The social information processing is a mechanism for encoding, processing of acquiring and retrieving of social data that improves social behavior in people (Bennett, Farrington and Huesmann, 2005). Results have shown that people with prosocial behavior, have social-cognitive patterns that protects their social-interest nature. For example, results of documents analysis demonstrate that people who have prosocial behavior, have attribution bias to be kind. In addition, prosocial people pursue social purposes less than their peers which make them encourage to respond to stimuli and thus involved them with negative emotions (eg., reveng actions) fall (Nelson and Crick, 1999). The relationship between emotional intelligence and prosocial behavior was also positive and significant. Researches of Charbonneau et al (2002) showed that the higher emotional intelligence in people, caused more altruistic behavior and social virtues. prosocial positions are predicted with low levels of distress and it's in accordance with a hypothetical arousal. prosocial people have far less turbulent in the face of provocations. They are also less likely to experience negative emotions that are associated with aggression in other words maladaptive reaction. People who are more capable to understand and managing their own emotions and feelings of others and they more likely respect the prosocial behaviors (Martin-Raugh, Kell and Motowidlo, 2016). Goleman consider that empathy and altruism behavior are deeply connected to emotional intelligence, in other words, both of these concepts are key species of prosocial behavior (Jena, Bhattacharyya, Hati, Ghosh and Panda, 2014).

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