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Research Article

The Relationship of 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

Introduction

Prosocial behaviors have been the subject of intense research in different areas of psychology with respect to situational, cognitive, and emotional factors (Penner, Dovido, Piliavin and Schroeder, 2005). A prosocial behavior is voluntary/intentional behaviors that benefit others, such as helping, sharing, cooperating with, and comforting others (Gross, Stern, Brett, & Cassidy, 2017). Prosocial behavior is in contradiction with anti-social behavior such as violence, aggression, and malicious actions (Knickerbocker, 2003). Prosocial knowledge is the recognition of people on how they behave in interpersonal relations rather than technical knowledge of facts and principles (Martin-Raugh, Kell and Motowidlo, 2016). Although it is indeed the behavior related to the welfare of others, in some cases, it can be motivated by a selfish behavior (Carlo and Randall, 2000). It has no direct benefit for the subjects and even may pose risks for them (Baron, Byrne and Branscombe, 2008). Types of prosocial behavior include altruism (Carlo and Randall, 2002, Bowles and Gintis, 2011, Farrelly 2019), cooperation (Bhogal, 2019), and trustworthiness (Ehlebracht et al. 2018). Children with prosocial behavior would have a tendency toward procreator and suitable social skills and low levels of negative emotions (Eisenberg, Fabes, Karbon, Murphy and Wosinski, 1996). Eisenberg divides the motivation of prosocial behavior into five levels in terms of age. Level One: At this level, children do prosocial behaviors based on the principle of pleasure and self-esteem. Preschool children are at this level. Level 2: Children at this level pay attention to the needs of others, although they conflict with their own needs. Decent environment situations are effective in the emergence of these behaviors. Primary school children have this feature. Third level: At this level, children have a stereotyped image of goodness and badness, and work to confirm others' opinions and to be good. Children are at this level at the end of elementary school. Level Four: At this level (early high school), children express prosocial and sympathetic responses based on feelings of guilt and duty. At the fifth level, which includes the high school level, people make prosocial behaviors based on internal motivations. Eisenberg's pattern was confirmed through a longitudinal study conducted by him. It should be noted that the occurrence of prosocial behaviors at each level depends on the environment and family situations (Eisenberg, 1998). As students enter the teenage stage from childhood, they would be dependent on 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 the factors related to prosocial behavior is the theory of mind

(TOM). Researchers have shown understanding one's own thoughts and emotions, understanding the thoughts and emotions of others, and compassion, empathy, and motivation facilitate prosocial behavior (Eggum et al, 2012). TOM is making reactions to the content of your mind and others (Kaysili and Acarlar, 2011). During the early years of school, children's TOM becomes more advanced and the mind acts as an active information processor in thinking (Wellman, Cross and Watson, 2011). It has been evidenced that talking about the mind is an important factor in determining individual differences in TOM (Bianco, Lecce and Benerjee, 2015). Emotional intelligence (EI) is related to empathy and empathy, in turn, is related to prosocial behavior. Therefore, 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. Moreover, it is the ability to recognize and respond to their own and others' emotions in the social interaction context. EI has two major natures including intelligence or a personality trait (Petrides and Furnham, 2003). It has been documented that people with great efficiency could improve their emotional intelligence level. This process initiates with the development of self-awareness through understanding thoughts and feelings about people and different situations. When they achieve a level of self-awareness, they likely move to understand others' feelings and use the obtained information to provide an appropriate response to others (Diggins, 2004). Emotionally intelligent people are those who are balanced, have insight into themselves and others, operate with integrity, respond well to challenges and connect to people (McPheat, 2010). Some studies have reported a significant positive relationship between prosocial behavior and goals of social information processing (SIP). Social information processing theory is about how children make decisions in social interactions (Crick and Dodge, 1994). Crick and Dodge (1994) proposed a model called social information processing. Based on this method, children view themselves in social situations and when faced with a difficult situation encode information and interpret social clues. Finally, they make the information available to their cognitive treasury according to this information, decide and evaluate possible responses to a given situation, and 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 improve people's social behavior (Bennet, Farrington and Huesmann, 2005). SIP model in addition to explaining successful social interaction of children also has various applications in 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 from Zanjan city, Iran. According to Krejcie & Morgan (1970) table for determining sample size for a 30,000 population, 380 (202 girls, 178 boys; Mage = 11.37 years, SDage = 1.62) students were selected using multi-stage random sampling and completed the questionnaires. Also, teachers completed prosocial behavior questionnaires for each student. We obtained written informed consent from the parents of the participants in this study. Also, the research plan was approved by the Ethics Committee of the university.

Materials

Tom Test

The original form of this test has 78 questions developed by Steerneman (1994, quoted by Morris et al., 1999) to assess the TOM in normal 5 to 12 years children and children with pervasive developmental disorders. This instrument provides information about social understanding, children's sensitivity and insight, and the degree of their ability to accept others' feelings and thoughts. In this study, we used the 38-question form of the TOM that has been used by Ghamarani, Alborzi, and Khayer (2006) on a normal group of students in Shiraz. The test has three sub-scales: a) precursors of the theory of mind (TOM 1; 20 items), b) first manifestations of a real theory of mind (TOM 2; 13 items), and c) more advanced aspects of the theory of mind (TOM 3; 5 items). The test is administered individually and includes some images and stories. The tester after providing these materials makes some questions to ask. Using this tool, a correct answer receives a score of 1 and a wrong answer receives 0. In the present study, the validity of the total test and each subtest level of TOM 1, TOM 2, and TOM 3 were 0.71, 0.66, 0.51, and 0.85, respectively.

The Schutte Self Report Emotional Intelligence (SREIS) 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 survey the Salovey and Mayer (1990) model of EI. The instrument comprises of three widely recognized sub-scales, which were described as follows: 1. appraise expression of emotion comprising 13 items, for example "I am aware of the non-verbal messages I send to others". 2. Regulation of emotion with 10 items, for example "I seek out activities that make me happy". and 3. Utilization of emotion with ten items, for example "When I feel a change in emotions, I tend to come up with new ideas". In this study, reliability for total test and subscales and expression of emotion, the emotion exploitation, and emotion regulation were 0.84, 0.66, 0.74, and 0.73, respectively.

Social Information Processing Skills

Different scales were used to measure social information processing skills as part of the data collection and evaluate 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 a research project with another friend, almost when you have finished half of your work, your friend says "I do not like your job" and rejects all your work" (Crick and Werner, 1998). The main scale includes seven purposes. Because Dlveaux and Daniels have reported a low correlation of the efficiency and overlap variables with other objectives, the goals avoiding trouble (i.e., stay away from trouble with powerful figures) and 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: 1) pursuing self-interests (trying to re-acquire the target), 2) having personal control (not letting classmates bully), 3) revenging (reprise classmates act), 4) maintaining the relationship with classmates (trying to keep up with classmates), 5) and maintaining relationships with other groups (ensuring that the other classmates like him). Students on a 5-point scale from 1 (strongly disagree) to 5 (strongly agree) determined how much they have a tendency to happen any purpose. The average score for each goal is between 1 and 5. According to Delveux and Daniels (2000), Cronbach's alpha for internal consistency was in the range of 0.84 to 0.96. In Martins' study (2010), Cronbach's alpha was 0.85 and 0.79 for the purposes of revenge and peace, respectively. In terms of the validity of the measures, it was found that communication can predict the choice of solutions; i.e., the purpose of revenge and physical aggression stems (Delveaux and Daniels, 2000). The reliability of SIP questionnaire and subscales of self-interests maintaining, personal control, revenge, relations with peers, and relations with the group were 0.65, 0.64, 0.66, 0.76, 0.63, and 0.70, respectively.

Child Behavior Scale

The Child Behavior Scale (Ladd and Profilet, 1996) was used to measure aggression, withdrawal, and prosocial behavior in children. The present study deals only with prosocial behavior that included eight items assessed by the teacher. The teacher's child behavior evaluation form was adapted from the Achenbach´s child behavior scale. The average score of

each person varies from 0 to 16, where a higher score indicates a stronger prosocial behavior. According to Ladd and Profilet (1996), there is a significant correlation between the two scales with aggressive behavior (Prosocial with Peers, $r = -0.19$, $p < 0.01$; Aggressive with Peers $r = 0.39$, $p < 0.001$) and prosocial behavior (Prosocial $r = 0.23$, $p < 0.01$; Aggressive $r = -0.19$, $p< .01$) during free play periods at school, and with aggression (Prosocial $r = -0.45$, $p < 0.001$; Aggressive $r = 0.71$, $p < 0.001$) and withdrawal (Prosocial $r = -0.35$, $p < .001$; Aggressive $r = 0.08$,*ns*) scores on the Teacher Report Form, the teacher version of Achenbach s Child Behavior Checklist.

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

Results

Descriptive statistics and results of the correlation coefficient between study variables are shown in Table 1.

	M	SD	sk	kur	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1.TOM 1	16.01	3	**-1.74**	**3.93**	1											
2. TOM 2	9.97	2.51	-0.34	-0.14	0.19**	1										
3. TOM 3	0.54	1.22	2.43	5.20	0.05	0.101*	1									
4. Self interest	13.18	2.94	-0.09	-0.07	0.06	0.004	.000	1								
5. Personal control	12.04	3.38	-0.54	0.11	0.26**	.457**	.062	.035	**1**							
6. Relationship with peer	12.72	3.34	-1.07	0.92	0.26**	.461**	-.041	.072	.530**	**1**						
7. Relationship with group	12.33	3.53	-0.83	0.18	0.29**	.577**	.111*	.013	.664**	.677**	**1**					
8. Revenge	8.49	4.13	0.91	0.07	-0.02	-.123*	.128*	.010	.091	-.141*	.036	**1**				
9. Regulation of emotion	36.69	6.54	-0.19	-0.76	0.22**	.479**	.032	.022	.449**	.466**	.607**	-.026	1			
10. Appraisal and expression of emotion	40.03	8.11	-0.16	-0.56	0.21**	.489**	.103*	-.020	.506**	.526**	.637**	-.007	.729**	1		
11. Utilization of emotion	34.22	7.49	-0.24	-1.05	0.27**	.608**	-.003	-.019	.503**	.557**	.681**	-.108*	.620**	.688**	1	
12. Prosocial behavior	12.48	4.13	-1.18	0.74	0.34**	.594**	.059	.012	.703**	.759**	.897**	.013	.630**	.666**	.702**	**1**

Table 1: Correlation matrix and descriptive statistics

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

Predictor	R^2	Adjusted R^2	B	β	F	t
Model 1	.804	.804			1.555E3	
Relationship with group			1.050	0.897		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		
Utilization 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		
Utilization of Emotion			.044	.080		
TOM 1			.060	.043		

Table 1: Multiple regression analysis of the TOM, emotional intelligence, social information process, and prosocial behavior

Based on the results of multiple regression analysis and by stage method (Table 2), multiple correlation ratios for the linear combination variables of the TOM, emotional intelligence, and social information processing, and prosocial behavior were MR=0/93 and RS=0.87, which are statistically significant at P<0/01. The obtained correlation coefficients show that about 87% of the variance of prosocial behavior variable is specified by predictor variables. Also, all three variables of social information processing, emotional intelligence, and TOM are essential to predict prosocial behavior. However, regarding the values of the regression coefficients in terms of the potency of prediction, relationship with the group was β =0.90 (P=0.01), with peers β =0.28 (P=0.01), and personal control β =0.15 (P=0.01), regulation of emotion β =0.10 (P=0.01), utilization of emotion β =0.08 (P=0.01), TOM1 β =0.04 (P=0.01), have more prediction power.

Discussion and Conclusion

The aim of this study was to investigate the relationship between TOM, emotional intelligence, and social information processing with prosocial behavior. As the results showed, estimated correlation coefficients between all three variables TOM, emotional intelligence, and social information processing with prosocial behavior were statistically significant. In general, it can be stated that the higher the scores of TOMS, emotional intelligence, and social information process, children show more prosocial behavior. The results are consistent with those reported in previous works. For example, Renouf et.al (2010) showed children with less aggression have more TOM ability. To explain these findings, researches have shown that understanding one's own thoughts and emotions facilitate understanding the 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 a tendency toward understanding others' emotions are expected to have more advantages due to their level of moral reasoning and show empathy tendencies to help others (Eisenberg, Spinrad and Sadovsky, 2006). When people participate in social interaction, they perceive the mental states of others, realize the underlying motivations of others' behavior, predict the next behavior, and then form their behavior and attitudes based on it (Astington, 2003). If children would not understand false beliefs, they cannot understand that others may have the social conditions that are contrary to them. Sharing behaviors needs to understand 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 TOM. Overall, this correlation suggests that prosocial actions are built based on expanding sensitivity to the other's views (Dunfield, 2014). The deep relationship of the TOM and correlation is based on the fact that unlike other forms of prosocial behavior, this correlation needs continuous interpretation of social-emotional symbols and one's own will to maintain it. In addition, correlation provides visible interpersonal interaction feedback that facilitates the development of children's TOM (Imutsa, Henry, Slaughter, Selcuk and Ruffman, 2016). Prosocial children have more opportunities for experience and they view the emotional benefits of these actions for themselves and others (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 protect their social-interest nature. For example, the results of document 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 that encourage them to respond to stimuli and thus involve them with negative emotions such as revenge actions (Nelson and Crick, 1999). The relationship between emotional intelligence and prosocial behavior was also positive and significant. Studies of Charbonneau et al. (2002) showed that higher emotional intelligence in people caused more altruistic behavior and social virtues. Also, prosocial positions are predicted with low levels of distress; this result is in accordance with hypothetical arousal. Prosocial people have far less turbulence in the face of provocations. They are also less likely to experience negative emotions associated with aggression (i.e., maladaptive reactions). People are more capable to understand and manage their own emotions and feelings of others and they are more likely to respect prosocial behaviors (Martin-Raugh, Kell and Motowidlo, 2016). Goleman considers that empathy and altruism behavior are deeply connected to emotional intelligence; in other words, both concepts are key species of prosocial behavior (Jena, Bhattacharyya, Hati, Ghosh and Panda, 2014).

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