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Efficacy of the Social Information Processing Model in Predicting Behavioral Disorders

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ABSTRACT

Background: The social information processing model is one of the most up-to-date cognitive models in the field of interpersonal interactions. This social-interaction-based model can be successfully used to investigate the reasons for emotional and behavioral problems and prevent them in children and adolescents.

Objectives: The present study was conducted to investigate the efficacy of the social information processing model in predicting behavioral disorders in children.

Materials and Methods: The present study used a descriptive correlational regression analysis. The study sample comprised 100 primary school students selected from different districts in Isfahan, Iran (2015-2016), using random multistage cluster sampling. Data collection tools included the Achenbach child behavior checklist and social stories by Bryan and Turcasia. The stepwise multivariate regression was used to analyze the data. SPSS software version 18 was also used for statistical analysis of the study.

Results: The results indicated that the social information processing model can significantly predict behavioral disorders ($p \leq 0.0001$). In other words, behavioral disorders were more prevalent in the students with lower social information scores.

Conclusion: The social information processing model was found to predict child behavioral disorders.

Keywords: Child Behavior Disorders; Cognition; Social Behavior

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Introduction

The health of children and adolescents is crucial in every community, and taking care of their mental health can help them improve their psychological and physical health and thus play a more effective social role [1]. It is clear that proper recognition of different physical and psychological dimensions of this age group and efforts to meet their physical and spiritual needs are crucial to their physical, emotional

and intellectual development. Studies conducted in different cultures suggest a high prevalence of behavioral problems in school and pre-school children [2]. Behavioral problems refer to all repetitive, abnormal and annoying behaviors, including depression, social problems, illegal behaviors, conduct disorders, aggression and hyperactivity, which cause personal and family dysfunction [3]. Behavioral disorders significantly and negatively affect academic and professional achievements in children and adolescents and increase the risk of psychological diseases in adulthood [4].

Given the importance and numerous effects of behavioral disorders in children, different models and approaches have been proposed to explain, predict and treat these disorders. The recently-developed social information processing model (Crick and Dodge, 1994) can be utilized to investigate the causes and prevent behavioral problems in children and adolescents using social-interaction-based data processing approaches. Data processing is a dominant approach in cognitive development introduced with the emergence of rapid computers in the 1950s [5]. The studies conducted by Herbert Simon et al. in the late 1950s revealed how psychological phenomena can be simulated with computers and help human process the news or data [6].

The methods by which children process social situations and behaviors constitute a major of body of literature associated with social recognition and developmental psychology. According to the social information processing model developed by Crick and Dodge, 1994, children first tend to encode and interpret the social cues of information in the face of difficult social situations. They then supply their cognitive treasury with the information obtained, decide accordingly, assess the potential responses to definite situations, and ultimately select a response and act accordingly [7].

The Dodge's model of social interactions is obviously cognitive based. Social situation is perceived as a rational situation and explained based on the information processing model, which comprises five units; the first unit involves the social stimulus (cue)and represents the data to be processed by the child; in the second unit that involves stimulus processing, the child gives meaning to the stimulus or social cues; the third unit represents action selection, i.e. the child should adopt a social behavior after processing the stimulus or social cue; the fourth unit is associated with "others", including peers who perceive the action taken by the child, and the fifth unit represents the social reaction provoked by the peers after processing the data received from the child. Social information is processed in the second unit of the five-unit model, i.e. the stimulus processing unit, in which Dodge defines five stages of encoding, mental representation, response accessing, evaluation and enactment.

In addition to explaining successful social interactions in children, the social information processing model can be used to explain the causes and prevent behavioral problems in children and adolescents. It can also be used in preventing reactive aggression in children [8], the defects of social information processing in the adolescents subject to severe aggression [9], enhancing social competencies and preventing aggressive behaviors [10], coping strategies in aggressive, secluded and shy children [6], predicting behavioral extroversion problems [11], predicting cardiovascular activities in antisocial adolescent behaviors [12],

mistreatment of the original family and symptoms of posttraumatic stress disorder (PTSD) [13] and intergenerational aggression transmission [14]. Conduct disorder is a prevalent and debilitating condition that creates many problems for teachers, families and the children themselves and significantly degrades the academic and professional achievements in children and adolescents. The present research was therefore conducted to investigate the efficacy of the social information processing model in explaining and predicting conduct disorder in primary school students in Isfahan, Iran.

Materials and Methods

The present descriptive correlational study was conducted in the 2015-2016 academic year on a statistical population comprising primary school students and their teachers in Isfahan, Iran. The social information processing model was considered the predictor variable and conduct disorder the criterion variable. Moreover, multistage random sampling was used to select subjects. Ten schools were first selected from a total of five educational areas in Isfahan. One hundred children were then randomly selected from these schools, as the study subjects, and asked to respond to social stories by Bryan and Turcasia while their teachers completed the Achenbach child behavior checklist. A sample size of 100 was calculated based on the minimum sample size required for correlational research [15].

Data Collection Tools

Social stories (Turcasia and Bryan, 1994), developed based on the social information processing model (Dodge, 1987), were used to measure social information processing. Bryan and Turcasia used five social stories to measure social information processing. The concurrent validity of the stories was confirmed using the teacher judgment scale. Moreover, the reliability of the stories was confirmed by calculating a test-retest reliability coefficient of 50%-83% [16].

Teacher's Report Form (TRF) was adopted from Achenbach system [17] and was used to measure behavioral emotional disorders in individuals of 6-18 years old. TRF can be completed by the teacher or other school staff who are familiar with the child's performance at school, including advisors, managers and their deputies. The first part of TRF contains 12 items measuring competencies, illnesses and disabilities of the child. The second part comprises 113 items and asks the respondent to rate behavioral, emotional and social problems on a scale of 0-2 based on student's status in the past two months. Cronbach's alpha of 0.97 calculated by Achenbach in 1991 confirmed the reliability of the TRF of the child behavior checklist [18]. The normalization and adaptation of this questionnaire was conducted by Minaei in 2003, who calculated a very desirable Cronbach's alpha of 0.83.

Analysis of the data

The stepwise multivariate regression was used to analyze the data. SPSS software version 18 was also used for statistical analysis of the study.

Results

The study students were 9-11 years old, including 46 (46%) nine years old, 30 (30%) ten years old and 24 (24%) eleven years old. Fifty (50%) of the subjects were in grade 3 and 50 (50%) others in grade 4. Table 1 reports the mean values of the study variables.

Table 1. The descriptive statistics of the study variables

Variable	Frequency	Mean	Standard Deviation
Encoding	100	5.59	1.58
Mental representation	100	5.56	1.81
Response accessing	100	8.75	1.58
Evaluation	100	19.84	4.54
Enactment	100	7.8	1.75
Total Score	100	87.07	40.65

According to table 1, the mean score of encoding is 5.59±1.58, mental representation is 5.56±1.81, response accessing is 8.75±1.58, evaluation is 19.84±4.54, enactment is 7.8±1.75 and the total mean score of behavioral problems is 87.07±40.65.

To investigate the relationship between the social information processing model and behavioral problems, the Pearson's correlation coefficients were reported in table 2.

Table 2. The correlation matrixes of the study variables

	1	2	3	4	5	6
Encoding	1					
Mental representation	0.85**	1				
Response accessing	0.50**	0.59**	1			
Evaluation	0.48**	0.36**	0.28**	1		
Enactment	0.55**	0.42*	0.26**	0.60*	1	
Total Score	-0.76**	-0.74**	-0.42**	-0.45**	-0.59**	1

*: $p \leq 0.05$; **: $p \leq 0.0001$

The results obtained showed the correlation of all information processing stages with the total score of behavioral problems to be significantly negative, meaning the higher the social information processing level, the fewer the behavioral problems. According to table 2, encoding presented the highest correlation with behavioral problems (-0.76), and response accessing the lowest correlation (-0.42).

Table 3. A summary of the regression of behavioral problems based on the social information processing model

Variable	Beta	Sig	R	R^2	F
Encoding	-0.253	0.04			
Mental representation	-0.415	0.001			
Response accessing	0.021	0.77	0.81	0.66	36.88
Evaluation	-0.019	0.8			
Enactment	-0.267	0.002			

Table 3 suggests a multiple correlation of 0.81 between behavioral problems and the stages of social information processing, meaning 66% of behavioral problems is predicted by the social information processing model. The correlation of behavioral problems with encoding was also found to be -0.25, with mental representation to be -0.41 and with enactment to be -0.26. Response accessing and evaluation were found not to significantly contribute to the prediction of behavioral problems.

Discussion

The present study sought to investigate the efficacy of the social information processing model in predicting behavioral problems in primary school students. The results obtained confirmed this efficacy and suggested a multiple correlation of 0.81 between behavioral problems and the stages of social information processing, meaning 66% of behavioral problems is predicted by the social information processing model.

The present findings are consistent with the results of different studies which suggest that the social information processing model not only explains successful social interactions in children, but also contributes to explaining the reasons and preventing behavioral problems in children and adolescents. The applications of this model include preventing reactive aggression in children [8], the defects of social information processing in adolescents subject to severe aggression [9], enhancing social competencies and preventing aggressive behaviors [10], coping strategies in aggressive, secluded and shy children [6], predicting behavioral extroversion problems [11], predicting cardiovascular activities in antisocial adolescent behaviors [12], mistreatment of the original family and symptoms of PTSD [13] and intergenerational aggression transmission [14]. Owing to their defective cognitive and social processing in problematic situations, children with behavioral problems suffer from contradictory reactions compared to normal children. Distorted and biased social information processing is also observed in these children in the face of social and family situations [14]. Not only are children with behavioral disorders incapable of achieving the self-fulfillment and skillful level in the social context, but also they are predicted to present antisocial behaviors in adolescence by presenting immature and disorganized behaviors; nevertheless, acquiring the skills that enable their expression of thoughts and emotions and help them with social interactions can enrich their interpersonal relationships in the family, school and society. Properly and persistently teaching social information processing skills to children and familiarizing them with the five steps of this model, namely encoding, mental representation, response accessing, evaluation and enactment, thus appear to help alleviate behavioral problems and enhance social interactions in children.

Another explanation provided by this hypothesis is that children and adolescents with behavioral disorders suffer from executive dysfunction, meaning they are unable of successfully achieving their goals through an effective performance. Executive functions are mainly associated with the prefrontal cortex and include learning, rule acquisition, abstract reasoning, and problem-solving, self-monitoring, attention control, resisting distraction and inhibiting inappropriate responses. Prefrontal dysfunction causes the dysfunction of cognitive processes, thus making children unable of problem-solving. Neurological research suggests that the sufferers also have problems with decision making, empathy and emotional control. Verbal skills are an effective tool for making interpersonal relationships. Children with conduct disorders have poor verbal skills and they receive low verbal and IQ scores in normalized tests. The potential causes of problems in these children can be explained by the contribution of verbal memory and abstract reasoning to self-control development as per Luria's theory [14].

According to Dodge (1993), children verbally unable of speaking reasonably may resort to aggressive behaviors in their social interactions. Enhancing social skills, developing anger management skills and modifying maladaptive schemas associated with the surrounding world appear to constitute major components of preventive and therapeutic interventions in the inflicted children.

Accordingly, teaching the social information processing skills and the five steps of this model, i.e. encoding, mental representation, response accessing, evaluation and enactment, to these children can alleviate their behavioral problems, enhance their social interactions and help them direct their behavior. Frieser *et al.* [10] also found the learning of social information processing skills to help improve the social competence and prevent aggression in children. In other words, thanks to these trainings, children with behavioral disorders are enabled to internalize their behavior, which acts as a self-control point of reliance. This is particularly crucial in children with special needs who suffer from more severe behavioral problems. These recommendations are hoped to be considered by the authorities of the education and training of children with special needs.

The present study limitations comprised the problems associated with the study setting, including its nonstandard nature and the impossibility to generalize the results to female populations. These limitations are therefore recommended to be considered in future research to help with the generalization of the findings.

Conclusion

The social information processing model was found to predict child behavioral disorders. The results obtained confirmed the efficacy of this model in predicting behavioral disorders.

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Conflict of Interest

The authors have no conflict of interest.

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