Original Article

The Impact of Successful Intelligence on the Social Growth of Preschool Children with Emphasis on the Mediating Role of Social Adequacy

Nasireh Moghaddamfar[1], Reza Ghorban Jahromi[1*], Bita Nasrollahi[1], Fariborz Bagheri[1]

[1] Department of Psychology, Science and Research Branch, Islamic Azad University, Tehran, Iran
Corresponding author and reprints Reza Ghorban Jahromi**:** Assistant Professor, Department of Psychology, Science and Research Branch, Islamic Azad University, Tehran, Iran**.**
Email: rrghorban@gmail.com

Abstract

Background: Social growth, as an important element of the development process, has significant impacts on children's mental health. One of the most important goals of childhood education is the social growth and social adequacy of children. The extent they have these skills affects their individual and social health as well as their academic success. The purpose of this study was to identify the impacts of successful intelligence on social growth of preschool children with emphasis on the mediating role of social adequacy.

Methods: The present study was a descriptive-correlational research. Its statistical population includes preschool children in Tehran in 2019. Totally, 370 children were selected by multi-stage cluster sampling method. Vineland Social Maturity Scale, Sternberg Successful Intelligence Questionnaire, and Bellini Social Adequacy Questionnaire were used for data collection. For data analysis, Structural Equation Modeling was used.

Results: Successful intelligence has a direct impact on social growth and social adequacy of preschool children (β=0.19; P<0.004), (β=0.42; P<0.001), and an indirect effect on social growth of children with a mediating role of social adequacy (β=0.18; P<0.001). In addition, social adequacy has a direct impact on their social growth (β=0.43; P<0.001).

Conclusion: The fit indices of the model showed that it has a good fit. Successful intelligence and social adequacy variables are effective in social growth of preschool children. They can be applied in the form of basic skills in formal education and as parenting skills to prevent and resolve interpersonal problems.

Keywords: Child, Preschool; Intelligence, Interpersonal Relations; Pediatrics; Social Adjustment.

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Introduction

Today, looking at the course of mental development focuses more on the critical period of childhood than on the adolescence and adulthood. In recent years, with the increase of child studies and the dominance of development approaches in modern psychology and psychiatry, promising contexts have been provided for researchers in this field (1). In the past, it was believed that children's problems are a transient aspect of their

growth process. However, continuity of these symptoms until adolescence and even adulthood was a warning to researchers in this field that the symptoms are not transient but persistence and they need to be prevented and treated. From a developmental perspective, psycho-pathology rather than considering adulthood and its symptoms has entered a new field of study with an in-depth and etiological view (2). Nowadays, psychopathology is looking for the foundations of childhood trauma formation and moves from mere diagnosis to developmental explanations. The basis of early interventions in the field of psychiatry can be considered as the belief in the significance of prevention at the early age (3). Early interventions, due to lack of cognitive development in children, are often interactive. In the meantime, children with special needs or disabilities are of special importance due to the existence of behavioral problems and psychological consequences of their disease.

In terms of social psychology, the child's social experiences are an introduction for his/her intellectual development, and due to the excellent functions of the mind, it is possible that the child establish dynamic social interactions (4). Accordingly, children without social skills who do not have successful interactions with their peers are more likely to experience internalized psychological disorders such as depression and anxiety, and externalized behavioral disorders such as impulsivity and aggression (5). Social growth involves experiencing a positive development in the relationships between oneself and others. Social growth, like other aspects of growth, is influenced by nature and education; and this structural and process development in the social brain continues to adulthood (6). Children with good social growth are more successful in maintaining a cooperative relationship, observing the rules, compassion with others, and controlling their negative feelings. The quality of social interactions in childhood affects social relationships in old age (7). Just as a healthy social structure can help fostering the mental health of individuals, an inefficient social structure, as an anti-value system, can lead to violence in society (8).

Research background indicates that children who use analytical, creative, and applied thinking abilities to achieve success, have a successful intelligence index. Having this factor can pave the road for achieving appropriate social growth (9). Sternberg's successful intelligence theory considers this type of intelligence as a combination of analytical, creative, and applied abilities that help children achieve adaptation, selection, environmental change, and finally achieving their objectives in life. Viana Mitana et al. showed in their study that schools expect students to think analytically (10). However, out of school and in the real world, creative thinking, particularly applied thinking, is more required. In this regard, the findings of the study conducted by Piqueras et al. (11) showed that emotional intelligence in children can predict the degree of their social compatibility. Viana Mitana et al. associate students' successful intelligence with their social growth, and consider facilitating the acceptance of change and social compatibility as one of the benefits of having high successful intelligence (10).

On the other hand, social adequacy is another key variable that can facilitate social growth (12). Mundy and Sigman (13) defined social adequacy as learned behaviors accepted socially and allow individuals to communicate effectively with others. They have also defined social adequacy as the ability of human performance to have personal independence and social responsibility (13). Social adequacy consists of four components: 1) Cognitive skills that include the information treasury, processing skills, information acquisition, decision-making ability, efficient and

inefficient beliefs, and documentary styles; 2) Behavioral skills that is the ability to select an available behavior and include role playing skills, assertiveness, conversational skills to initiate and continue social interactions, learning skills, and learning to be friendly with others (14); 3) Emotional skills that are used to establish positive relations with others, creating and developing mutual trust and supportive relationships, identifying and responding properly to emotional symptoms in social interactions or stress control; and 4) Motivational skills including valuable structure of the individual, the level of moral growth, sense of effectiveness and control, and sense of self-efficacy (15). Some studies have pointed to the role of people's living environment on the relationship between social adequacy and success intelligence. In a study conducted in Iran shown the prevalence of childhood social-behavioral problems in outskirts of cities was large (15).

Given the changes in the lifestyle of Iranians today and the prevalence of psychological and behavioral problems in children and adolescents (15), it seems necessary to consider the social growth process and planning proper strategies to strengthen and improve social relations in children. Since it seems that successful intelligence can predict social growth through social adequacy, and given the lack of similar studies in Iran, the present study aims to investigate the mediating role of social adequacy regarding successful intelligence and social growth in preschool children.

Methods

This descriptive study was conducted on preschool children in Tehran in the academic year of 2019-2020. The sample size was calculated through structural equation modeling. Samples were obtained using multi-stage cluster random sampling method. The present study was performed on 450 children. After obtaining written informed consent from all parents; then a checklist of demographic information including age, education and job of parents, the number of children and their order, intelligence status, physical health of other children, and the type of physical-motor injury as well as questionnaires Structured Clinical Interview (SCID), Vineland Social Maturity Scale (VSMS), Bellini Social Sufficiency Questionnaire (2007), Sternberg Successful Intelligence Questionnaire (2005) for each child were completed by trained people in the centers. The reliability and validity of all those questionnaires were evaluated in previous studies (16-18) .

Statistical Analysis

The obtained data from the questionnaire was analyzed using statistical package for social sciences (SPSS) version 23 (IBM Inc. Chicago, IL) for windows and Amos-V8 software and using structural equation modeling.

Ethical considerations

The ethics committee approved this study with the unique ID of IR. IAU. SRB. REC. 1398, 223. Explanations about knowledge of the study goals, voluntarily participation, observing their privacy right, confidentiality, non-registering their identification specifications, the right to relinquish all stages of data collection, and informed consent form was signed by parents. All the terms of the Helsinki declaration were considered and the personal information remained anonymous.

Results

Initially, the hypotheses of the structural equation modeling were examined. The missing values were examined by Expectation Maximization (EM) method,

Table 1. Distribution of subjects' scores in tree variables

Variable	Mean	Standard deviation	Skew	Elongation
Analytical intelligence	54/27	65/6	03/0	40/0
Creative intelligence	98/31	19/6	32/0	34/1
Practical intelligence	90/26	33/4	-41/0	14/1
Successful intelligence	86/41	19/14	12/0	68/0
Mutual social behavior	72/67	75/9	-26/0	-47/0
Social participation	81/31	92/9	-20/0	-57/0
Mature social behavior	29/47	57/9	-42/0	-24/0
Social adequacy	82/146	86/24	-09/0	-33/0
General self-help	40/8	37/2	84/0	67/2
Self-help in eating	23/9	56/2	-05/0	20/0
Self-help in dressing	32/8	53/2	72/0	87/2
Hobbies	43/8	43/2	06/0	96/0
Movement	72/8	56/2	00/0	90/0
Self-guidance	24/7	55/2	72/0	77/2
Communication	20/8	43/2	-07/0	75/0
Social	29/8	37/2	75/1	32/2
Social growth	83/66	19/13	02/0	07/2

and the desired criterion wasmet. Moreover, according to the Kolmogorov-Smirnov test it was found that data distribution was normal. The hypothesis of linear relationships was verified using the Dispersion Diagram method. In addition, the hypothesis of linear multiplicity was examined through two tolerance and variance inflation factor indicators, and the desired criterion was met. In this study, out of 450 children, 236 (44.52%) were girls and 214 (56.47%) were boys. Descriptive indicators of subjects in the studied variables are presented in Table 1.

As can be seen in Table 1, among the different aspects of social growth of preschool children, the highest mean is related to self-help in eating and the lowest mean is related to self-guidance. Moreover, the components of successful intelligence are slightly lower than the midpoint of the questionnaire for all three components of analytical, creative, and practical intelligence. Considering social growth, the total average and most of the subscales are about the midpoint and slightly above that. Also, the social adequacy of subjects is slightly higher than the average scale. Coefficients and significance of factor loads of measurement models are presented in Table 2.

As can be seen in Table 2, the factors of all three scales have a significant factor load at 95% confidence level. The coefficients of direct effect of successful intelligence on social growth and social adequacy are presented in Table 3.

According to Table 3, the direct effect of successful intelligence on social growth was significant at the level of 0.01 according to the obtained coefficient (t= 2.91 and β= 0.19). In addition, the direct effect of successful intelligence on social adequacy (t= 6.72 and β= 0.42) was significant at the level of 0.01. The direct effect of social adequacy on social growth (t=6.64 and β= 0.43) was also significant at the level of 0.01. In addition, the obtained findings indicated that the indirect effect of successful intelligence on social growth of preschool children is significant ($p < 0.01$)

Table 2. Coefficients and significance of factor loads of the model

Scale	Component	Standardized weight	Statistics t	Sig
Successful intelligence	Analytical intelligence	91/0	07/10	001/0
	Creative intelligence	72/0	69/9	001/0
	Practical intelligence	52/0	84/6	001/0
Social adequacy	Mutual social behavior	85/0	51/17	001/0
	Social participation	80/0	08/16	001/0
	Mature social behavior	65/0	54/13	001/0
Social growth	General self-help	47/0	29/7	001/0
	Self-help in eating	67/0	77/8	001/0
	Self-help in dressing	48/0	40/7	001/0
	Hobbies	76/0	26/9	001/0

Table 3. Coefficients of direct effect of successful intelligence on social growth and social adequacy

Criterion variable	Predictive variable	Type of effect	Non-standardized coefficient	β standardized	Significance statistics	sig
Social growth	Successful intelligence	direct	09/0	19/0	91/2	004/0
Social adequacy	Successful intelligence	direct	156/0	42/0	72/6	001/0
Social growth	Social adequacy	direct	34/0	43/0	64/6	001/0
Social growth	Successful intelligence	indirect	35/0	81/0	75/3	001/0

due to social adequacy (t= 3.75 and β= 0.81). The structural model fit indices are presented in Table 4.

As can be seen in Table 4, the results related to the model fit indices in the sample of preschool children including chi-square index on the degree of freedom (X^2/df), root mean square error of approximation (RMSEA), comparative fit index (CFI), goodness of fit index (GFI), and adaptive goodness of fit index (AGFI) were equal to 1.03, 0.08, 0.97, 0.96, and 0.94, respectively. The numerical value of the calculated amounts indicates the optimal fit of the model.

Table 4. Fit indices of the model

index name	Fit indices	
	Amount	Limit
$\frac{\chi^2}{df}$	03/1	Less than 3
RMSEA	08/0	Less than 0.1
CFI	97/0	Higher than 0.9
GFI	96/0	Higher than 0.9
AGFI	94/0	Higher than 0.9

Discussion

The aim of this study was to identify the impacts of successful intelligence on social growth of preschool children with emphasis on the mediating role of social adequacy. The findings indicated that the assumed model of social adequacy mediation regarding successful intelligence and social growth in preschool children has a good fit with the data. In addition, all regression weights in the assumed model were statistically significant. The present study is the first research conducted in this field. However, in line with the research background, it shows that there is a significant relationship between intelligence and social skills. In this regard and according to the findings of the present study, the results of the study conducted by Trigueros et al. (19) indicated that there is a significant direct relationship between intelligence and social skills of children. Also, the findings of the study conducted by Hirosawa et al. (20) indicated that social cognition, as one of the components of intelligence, can play a significant role in establishing social interactions. The results of the study conducted by Espinosa and Rudenstine (21) indicated that intelligence along with social support and adequacy is inversely related to psychiatric symptoms. On the other hand, the findings of Gomez Baya, Reis, & Gaspar de Matos (22) showed that social growth and development has a positive relationship with social involvement and integration and leads to good compatibility. In this regard, and in the form of Sternberg theory, the findings of the study conducted by Mitana, Mojaja and Sampala (10) indicated that success requires skills beyond memory and cognition, which should be addressed in the field of successful intelligence.

In explaining these findings, it should be noted that improving the analytical and creative capabilities in children (successful intelligence) can provide a new perspective for the child and improve the reasoning power, inventing a different problem-solving method, examining the problem from various aspects and respecting the opinions of others, and paves the road for social compatibility and consequently social growth. Children with analytical thinking abilities have the successful intelligence index and having this factor can lead to achieving the necessary social growth (9). The teaching method based on successful intelligence helps students to develop their potential abilities. Because teaching based on successful intelligence gives confidence to students to develop their talents by improving their strengths and correcting or compensating their weaknesses (9). Therefore, by relying on potentials, it provides the necessary context for students' success and develops a sense of self-adequacy in them. Successful intelligence improves social adequacy in children. Social adequacy is the power of social interaction, that is, the acquisition of skills, abilities, and capacities that include cognitive skills, social skills, emotional adequacy, and motivational incentives.

Social adequacy facilitates the social skills required for successful interact with peers. In children with social adequacy, internalized psychological disorders such as depression and anxiety and externalized behavioral disorders such as impulsivity and aggression are less common (5).

A child with high social adequacy is a child who can adapt well to his/her environment and avoid conflicting verbal and physical situations by communicating with others. Such a child exhibits behaviors that lead to positive psychosocial outcomes such as acceptance by peers and effective relationship with others. Therefore, it can be assumed that successful intelligence facilitates social growth through social adequacy. Social adequacy leads to child's progress towards achieving goals and at the same time, ensures social acceptance. Social adequacy enables the child to exhibit appropriate behaviors in different situations and predict his or others' behavioral outcomes, as well as provides a sense of being valuable and social participation opportunity. A child with social adequacy communicates with others in such a way that not ignores the rights, satisfaction, and/or duties of others, and can hopefully experience open and free exchanges with others, which leads to social growth. Kindergartens and schools, by relying on successful intelligence teaching methods, can develop children's potential abilities and provide a context for a sense of social adequacy and consequently, social growth.

Relying on self-reporting tools to collect data should be cautious because such tools rely on subjects' accuracy, precision, and honesty about their experiences and behaviors, and therefore the provided data may be biased. It is suggested that in future studies, along with paper and pen tools, biological evaluations such as cortisol level (23) and interleukin-6 level (24) be used. It is also suggested that in order to improve social growth of preschool children, various courses be held about using successful intelligence teaching methods for kindergarten educators. Conducting a clinical trial to examine the effectiveness of successful intelligence in the social growth index by controlling social adequacy can be a promising path for future studies.

Generally, the present study indicated that successful intelligence has an indirect impact on social growth in preschool children through social adequacy mediation role, and successful intelligence can play a significant role in social growth and social adequacy of students. Children with successful intelligence adapt themselves to the environment and changes, and make appropriate selections by balancing the analytical, creative, and practical thinking abilities. Therefore, improving the analytical and creative abilities in children can give them a new view and enhance their reasoning power, inventing solutions to solve different problems, examining the problem from different aspects, and respecting the others' opinions. In addition, teaching problem solving and analytical thinking leads to their social growth. On the other hand, if children gain the necessary social adequacy, they can adapt well to their environment and avoid conflicting verbal and physical situations through communicating with others. Desirable social training and compatibility with social groups is not possible alone and without providing appropriate opportunities. The sooner these opportunities are provided, the easier the child's social growth and social adequacy will be gained. Therefore, sending a child to kindergarten is very useful to complete and develop the social relationships that he/she needs at home and in contact with his/her peers. There, the person who communicates with the child more than others is the educator, who plays a significant role in transmitting social concepts and developing social skills to the child according to his/her abilities, skills, and the use of his/her intelligence. One of the limitations of this study was the limited sample of preschool children. Moreover, since the present study has been conducted

on preschool children in Tehran, it is necessary to be cautious in generalizing its results to other groups and cities. Another limitation of this study was control of confounding variables such as socioeconomic class and other emotional and personality specifications. Thus, considering these limitations, it is suggested that the teaching of empathy and social adequacy skills be included in formal education and parenting skills. It is also suggested to improve the social growth of preschool children by holding recreational and educational camps, so that the children can interact with others.

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Authors' contribution: NM,RJ,BN,FB designed the study. NM,RJ collected the required datasets and data was analyzed by NM,RJ,BN,FB. ALL authors contributed in draft manuscript writing and revisions.

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