

An Investigation into the Influence of Adler-Based Training Approach to the Improvement of Social Problem-Solving Skills and the Reduction of Impulsiveness in Students with Mathematics Disorder

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Abstract The aim of this study was to investigate the Adler-based approach to the improvement of social problem-solving skills and the reduction of impulsiveness in students with mathematics disorder. This study is an experimental one including a pretest and a posttest on the control group. The study population included the male students afflicted with mathematics disorder in the city of Zanjan, Iran in the school year 2012-2013. The participants were 40 parents whose children had mathematics disorder. They were selected randomly among the parents of children in 7 junior high schools and they were put in the experimental and control groups (15 people in each group). In order to collect the data two questionnaires were used namely social problem-solving and impulsiveness questionnaires. The results of covariance analysis (MANCOVA) showed that Adler-based approach to parents' training had impact on reducing the impulsiveness and the improvement of social problem-solving skills ($p < .01$). It reduced the impulsiveness and improved the social problem-solving skills of students with mathematics disorder. We conclude that Adler-based therapy is an effective method in the improvement of the behavioral sings of students with mathematics disorder and it is necessary to examine its difference in other variables which are related to students afflicted with mathematics disorder.

Keywords: *Adler's approach, impulsiveness, mathematical disorder, parents' training, social problem Solvin*

Cite This Article: Mojtaba Ashouri, Shahram Vahedi, and Tooraj Hashemi, "An Investigation into the Influence of Adler-Based Training Approach to the Improvement of Social Problem-Solving Skills and the Reduction of Impulsiveness in Students with Mathematics Disorder." *American Journal of Applied Psychology*, vol. 4, no. 1 (2016): 11-16. doi: 10.12691/ajap-4-1-2.

1. Introduction

According to the definition of individuals with disabilities education act, learning disability is a disorder in one or several fundamental psychological procedures including the comprehension of language or its application. This disorder is shown in the form of disability in thinking, listening, reading, writing, speaking, or mathematical calculations. However, it does not include those learning problems caused as the result of visual, auditory, or motor disabilities, mental retardation, emotional disorders, environmental, cultural or inappropriate economic conditions [28]. The prevalence level of mathematical disability has been estimated between 5 to 8 percent [23,36,38]. In the cognitive patterns of mathematics problem solving proposed by Montague [31], solving mathematical problems is considered as a complex interplay between cognitive, hyper-cognitive, emotional and motivational components [32,40]. Students with mathematics disability have a lot of problems in different fields such as solving oral problems and the skills associated with them, identifying the obvious information

in problems, using self-adjusting and self-observing strategies in the process of doing homework and focusing their attention until finishing their homework [35].

Problem solving ability is one of the variables whose investigation in students afflicted with mathematical disorders is of great significance. Problem solving and social problem solving skills are considered as important life skills in the present time. This skill plays a crucial role in the improvement of mental health [41]. Problem solving inabilities are related to some emotional problems [12]. The literature of the study has proved a relationship between effective problem solving ability and social and psychological merits [41]. In fact, lack of problem solving ability has been reported in disorders such as anxiety [19] and depression [42]. In many definitions, social problem solving is considered to be a purposeful and conscious activity, and also a cognitive, purposeful and effective consequence [34]. D'Zurilla et al [15] designed a pattern of social problem solving consisting of 5 dimensions. Positive problem orientation and negative problem orientation are among orientation variables and the remaining 3 dimensions are associated with problem solving styles and patterns including rational problem

solving, impulsivity/carelessness problem solving style, and avoidance problem solving style.

Another factor which can affect the educational trend of students with mathematical disorders is impulsiveness. The impulsive behaviors are sometimes referred to as adventuresome behaviors which include a large set of actions upon which little thought has been devoted. They take place instantaneously and immaturely in the absence of an appropriate planning without concentration on a special task and possess high degree of risk and danger [43]. A review of the previous studies conducted on impulsiveness shows that impulsive behaviors are the main cause of many mental disorders such as hyperactivity/attention deficit, conduct disorder, impulse control disorder, drug abuse, Bulimia, suicidal behavior, personality disorders, and learning disorders [18,21,37]. Today, impulsiveness is conceptualized in the form of a cognitive dimension, i.e. impulsiveness is accompanied with cognitive disinhibition, the slow and deficit trend of decision making and emotional instabilities [17].

One of the treatments which can have a good effect on reducing the behavioral disorders in students afflicted with mathematical disorders is Adlerian therapy. Adlerian therapy is some sort of psychological-educational, present-future based and short term approach which is theoretically congenial, integrated and combined and clearly integrates all cognitive and systematic comprehensions [33]. As a matter of fact, the Adlerian approach is an introduced cognitive-behavioral and analytical approach [33]. Its psychological hypotheses and features have a great capability for application in various cultural populations (Wattes & Piterzak, 2000). The Adlerian therapist views his subjects as discourage people, not patients (Kanz, 2001). Thus, Adlerians do not try to cure anything, but they consider treatment as an encouragement process (Wattes, 2008). According to Adler's approach, encouragement reinforces one's confidence, feeling and self-realization and can be considered as a key for self development and education. Encouragement is a key concept in promoting and activating social desire of people [20]. There are also various dimensions for encouragement and positive attitude and view, sense of belonging, and incompleteness courage are some of its very important dimensions [16]. Thus, encouragement is not a special kind of language, but it is some sort of basic attitude based upon human nature [20].

The research results indicate that anger and impulsiveness can weaken cognitive performance and judgment and create controversies and, finally, prevent problem solving [10]. Kopp [25] realized in one of his studies that educating parents with the Adlerian approach can help reduce the destructive behavior in aggressive children. Bradley [11] trained 222 parents with the above-mentioned method in a comprehensive study and realized that application of such method can significantly decrease the behavioral problems in children afflicted with learning disabilities. In another study, Gutierrez [22] compared the Adlerian and behavioral approaches in reduction of behavioral disorders in Hispanic families of United States and realized that Adlerian and behavioral therapy had equally positive influences on improving the interfamily relationships and child rearing skills. Dagley, Campbell, Kulic & Dagley [16] realized in their study that group education of parents based upon the Adlerian approach

can promote positive self-view, sense of belonging, and educational self-efficiency in students afflicted with learning disability. Messer [30] realized that impulsive students have a poorer performance than reflective children in solving their mathematical homeworks and are incapable of preserving and retaining their attention while doing cognitive and emotional homeworks. The results also indicated that due to particular complexities of mathematics, impulsive students face more emotional and sentimental problems in solving mathematical problems. Liz Hartz & Lynette Thick [27] showed in one of their studies that an Adlerian-based educational program can help reduce negative emotions and promote the social participation among aggressive students.

Overall, the results of the previous studies indicate that educating parents based upon the Adlerian approach as education method can have a great influence on reforming the cognitive and educational processes of children afflicted with learning disorders. On the other hand, if we take into consideration the long term consequences of mathematical disorder and its increasing prevalence among students and the vital role of mathematics in today's modern life, appropriate planning for rehabilitating such students and correction of their learning problems are quite necessary. Conducting several researches in this field and the absence of any researches about the effectiveness of this method on the emotional and social problems of students afflicted with learning disabilities, utilizing the results of this study in therapeutic and consulting environments and paving the way for future researches are issues that add credence to its novelty. Thus the goal of the present study is to investigate the effectiveness of parents' training with the Adlerian approach on reduction of impulsiveness and promotion of social problem solving skills of students afflicted with mathematical disorders.

2. Methodology

This study includes an experiment conducted by the pretest and posttest on the control group in which the effectiveness of an independent variable (parents' education with Adlerian approach) on dependent variables (impulsiveness and social problem solving among the students afflicted with mathematical disorder) was investigated. An image of this plan is presented in Table 1.

Table 1. the experiment plan with pretest-posttest with the control group

posttest	intervention	pretest	group	sampling
20	X	10	E	R
50	-	40	C	R

The study population of this research included all parents of the male junior high school students of Zanjan city afflicted with mathematical disorder in the school year 2012-13. The research sample included 40 parents with mathematical disorder children chosen randomly among the parents of such students of 7 junior high schools in Zanjan after interview and identification through Keymath test in 2012. Concerning the sample selection, we must remember that each sub-group must include at least 15 people. Should the selected sample be the real representative of society and the research have

high external validity, the sample was assumed to consist of 40 people (20 for each group) [3]. The following tools were used to collect data in the present research:

Structural clinical interview for DSM-IV disorders: SCID is a semi-structural clinical interview used to identify disorders based on DSM. In a study conducted by Besco et al, the potential procedure of SCID for use in mental health clinic was tested and the results indicated that it can be used to guarantee a valid and precise diagnosis [7].

Keymath mathematical test: this test was normalized by Cornoli, Natchman & Pritchett in 1976. This test is used to determine the points of weakness and strength of students in various modules of mathematics. The validity coefficient of this test was calculated to be 0.80 based on Cronbach's alpha [6]. This test is used to identify students with mathematical disorders.

The impulsiveness scale: this scale was developed by Barrette [8]. This scale consists of 30 items and the respondents answer these items based on four degrees (never, sometimes, often, nearly and always). This scale measure three components of chaos, motor and cognitive impulsiveness [9]. In a pilot research, Pourkord [2] reported the Cronbach's alpha coefficient and the retest validity coefficient (after one month) of this scale as 0.87 and 0.79 respectively. The Cronbach's alpha coefficient of this scale was calculated to be 0.80.

Dizorilla's social problem solving revised questionnaire: Dozorilla et al [4] have developed this questionnaire based on the empirical studies conducted in Spain (quoted by Abolghasemi and Narimani, 2005). This questionnaire consists of 52 items and the respondents answer the questions by a 5-degree Likert scale (completely wrong, completely right, moderately right, quite right, and nearly right). This questionnaire is organized in five scales of positive problem orientation, negative problem orientation, rational problem solving, the careless-impulsive style and organizational avoidant style. The Cronbach's alpha coefficients for its scales in the American sample was reported to be between 45 to 91 percent, while in the Spanish sample it was reported to be between 46 to 85 percent. This questionnaire is translated to Persian and validated by Hedayati, Salehi, and Abolghasemi (2005).

Administration method: after making the arrangement with the Bureau of Education and Training and obeying the ethical considerations and stating the goals of the study, parents and teachers were informed about the research and the consent of parents was gained for participation in this study. In addition to justifying the parents who were the sample of the research and stating the goals of the study, the participants were asked to take part in the whole length of this educational period. Prior to starting the educational method, the pretest was administered for both groups and they were asked to answer the questionnaires according to their features. The test group undertook parents' training with Adlerian approach. The educational period consisted of 10 75-minute sessions held every week in the bureau of education and training. During these sessions and two weeks after the end of training, both groups took the posttest and the data collected were analyzed by multi-variable covariance analysis test method.

The educational sessions plan based on Adler's training plan (quoted from [1]): 10 educational sessions were organized based on the specific 6-step structure. The first step includes a tranquilizing exercise to help the participants get rid of their daily anxieties. During the tranquilizing exercises, the consultant gives them encouraging ideas and thoughts. Then, participants will be given time to discuss the feedback of the previous session's training and everyone is given one minute to tell the rest of the group something about his experience and assignment. Then, information concerning the particular topic which is the focus of that session will be taken into consideration. The fourth step consists of an exercise associated with this information. After the assignment for the next session is specified, the session ends with another tranquilizing exercise titled "the future step". During this exercise, the consultant asks the participants to think of methods by which they can apply the new skills and information of that session in their daily life. They are asked to imagine such situations. The titles for these ten sessions are:

First session: communication and emotional challenges. The participants also discuss and learn about encouraging behaviors and qualities;

Second session: teaching child rearing methods, the incorrect goals of the child; exploring the individual's quest and education of the concept of individual psychology consequentialism to the participants;

Third session: getting to know and challenge the life assignments and encouraging others and admitting your mistakes;

Fourth session: identifying the personal priorities and basic life mistakes, learning affectionate thinking and encouraging yourself and others;

Fifth session: exploring one's quest and gaining insight, learning cooperation skills, identifying and rebuilding the initial memories. This session also focuses on the influence of gossiping and backbiting on relationships and the integrity and unity;

Sixth session: it focuses on methods for creating positive relationships; this session also encourages individuals to know themselves, gain insight, evaluate the goals of life, and challenge themselves with a private logic;

Seventh session: gaining insight, encouragement and lionizing (steps taken to lionize yourself) and explaining and extending the sixth session;

Eighth session: investigating the role of yourself in tough situations and knowing the impediments on the path to gaining your goals, changing the role of emotions;

Ninth session: investigating self image;

Tenth session: finally in the tenth session, there will be an evaluation of the previous sessions.

3. Results

The average and the standard deviation of the age of the students afflicted with mathematical disorders in the experiment and control groups were respectively 15.17 (and 3.28) and 14.45 (and 2.37). As for the fathers of the sample in the experiment and (control) group, the following results were reported about the number of their kids: 23.33 (and 21.36) with one kid, 22.15 (and 34.45) with two kids, 30.63 (and 28.25) with three kids, and

23.89 (and 15.94) with four kids and more. The following results were also reported about the educational level of fathers (and mothers) in the experiment group: 65 (and 59) percent below highschool diploma, 25 (and 31) percent with high school diploma, 7 (and 7) percent with college diploma, 3 (and 3) percent undergraduate, and 7 (and 4)

percent with post graduate degrees. As for the occupational status of fathers in the experiment (and control) group, 25 (and 33) percent of them were employees and 75 (and 67) percent of them were self-employed.

Table 2. the average and standard deviation of impulsiveness and social problem solving in the parents of students afflicted with mathematical disorder in both control and experiment groups

variable situation	experiment				control			
	pretest		posttest		pretest		posttest	
	M	SD	M	SD	M	SD	M	SD
social problem solving	120.63	13.89	137.54	16.47	119.74	13.58	122.65	12.1
impulsiveness	82.36	7.41	65.39	4.58	81.36	5.15	77.46	5.89

As it is seen in Table 1, the average (and standard deviation) of the respondents' pretest score in the experiment group is 120.63 (and 13.89) in social problem solving and 82.36 (and 7.41) in impulsiveness. The posttest score of the respondents is 137.54 (and 16.47) in social problem solving and 65.39 (and 4.58) in

impulsiveness. The average (and standard deviation) of the respondents' pretest score in the experiment group is 119.74 (and 13.58) in social problem solving and 81.36 (and 5.15) in impulsiveness. The posttest score of the respondents in control group is 122.65 (and 14.1) in social problem solving and 77.46 (and 5.89) in impulsiveness.

Table 3. information concerning the credit indicators of multivariable covariance analysis test

influence	test	value	F	DF hypothesis	DF error	P	Eta
	Pillai's effect	0.653	3.143	2	32	$p \leq 0.001$	0.653
group	Wilks lambda	0.048	3.143	2	32	$p \leq 0.001$	0.653
	Hotelling effect	19.643	3.143	2	32	$p \leq 0.001$	0.653
	the largest root on	19.643	3.143	2	32	$p \leq 0.001$	0.653

The results of Wilks lambda test indicated that the majority of the group was significant in terms of combination of impulsiveness and social problem solving [Wilks, $F(3,143) = 0.048$, $p \leq 0.001$]. The above test has considered the capability of using multivariable covariance analysis (MANCOVA) acceptable. The results indicated a significant difference between at least one of the variables studied between the two groups studied. Prior to using multivariable covariance analysis parametric test in

order to follow its hypotheses, we used Box and Lown's tests. Based on the Box test which was not significant for any of the variables, the condition of homogeneity for variance/covariance matrixes was correctly observed (BOX=82.703 and $F=1.323$, $P=0.27$). Based on the Lown's test and its insignificance for all variables, the condition of intergroup variances equality has been observed.

Table 4. Multivariable covariance analysis test results on the scores of impulsiveness and social problem solving components in the two groups of parents' training with the Adler's approach and control group

situation	variable	SS	dF	MS	F	P	Eta
y-intercept	impulsiveness	13086.520	2	4362.173	131.561	$p \leq 0.001$	0.923
	social problem solving	18213.410	2	6071.137	92.467	$p \leq 0.001$	0.894
group	impulsiveness	11325.052	1	11325.052	341.558	$p \leq 0.001$	0.912
	social problem solving	7765.739	1	7765.739	118.276	$p \leq 0.001$	0.782
error	impulsiveness	1094.182	33	33.157			
	social problem solving	2166.698	33	65.658			
total	impulsiveness	119603.000	37				
	social problem solving	378084.000	37				

The results in Table 3 indicate that there is a significant difference between the average scores of social problem solving ($F=118.276$) and impulsiveness ($F=341.558$) between parents education groups with Adler's approach and the control group ($p \leq 0.001$). In other words, these results indicates the promotion of social problem solving and reduction of impulsiveness in the test group that the control group.

4. Discussion and Conclusion

The aim of this study was to investigate the effectiveness of parents' training with Adlerian approach on reduction of impulsiveness and improvement of social problem solving in students afflicted with mathematical

disorder. Based on the results of this study, we can conclude that Adlerian therapy based on the compound pattern is effective in controlling the impulsiveness of parents of students with learning disorders, it has changed the parent-child relationships, and it has promoted the social problem solving skills and the psychological compliance of such students. Since no previous studies have been done on this issue, these results can be in line with other studies (for example [11,16,25]). In describing these results, we can say that when people are faced with stressful situations (such as scolding and humiliation by others), the show complicated responses. Some of these responses are irregular behavior and impulsiveness. As a matter of fact, the pressures put on parents with exceptional children decreases their tolerance of having such a child and would result in their aggressive behavior.

The external pressure can directly and indirectly influence the individual's health. By educating the parents and informing them, the pressure imposed upon them but the outdoor environment can be returned to the families. Various compound methods such as tranquilization, sympathy, encouragement and mixing them with the cognitive-behavioral approach like fighting off the negative thoughts can help people react against external pressures with greater compatibilities so that no irregular and impulsive behaviors may be shown [5]. In another description of these results, we can say that the relationships between parents and children can have a significant influence on the mental, physical, social and economical health of the child [24]. In fact, weak family interactions based on unstable child rearing based on punishment, cold or rejecting approach of parents, harsh and unstable discipline rules, unsafe emotional attachment, the insufficient control or observation of parents and devoting little time to the child and lack of positive relationship [26] are considered as dangerous and predictive factors which put these kids in the danger of showing aggressive behaviors [44]. On the other hand due to the emphasis of Adler's approach on responsibility, attempts for gaining superiority, searching for value and meaning in life, this approach teaches a development pattern to these parents in their interaction with kids. This approach is mostly concerned with teaching better ways to participants and emphasizing the problem-based approaches to education.

The results of this study also indicated that Adlerian therapeutic methods help increase social problem solving skills level in parents with students afflicted with mathematical disorder. In addition to confirming the results of the previous studies, these results are also in line with the results of the studies conducted by Gutierrez [22]; Dagley, Campbel, Gleich and Dagley, [16]; and Lizharter and Lint Think, [27]. In justifying the effectiveness of Adlerian intervention in promoting problem solving skills, we can say it is quite possible that attending training sessions and getting to know other parents with children afflicted with learning disorders can make such a problem for the student and his family something quite usual and reduce their mental pressures, because only one student is usually diagnosed formally with learning disorders in a school and this sense of loneliness is troublesome for both the individual and his family. Thus, attending the sessions seems to inform parents of their kid's problem, help them admit it and deal rationally with this problem, and also identify their false believes and thoughts. On the other hand, as this approach is an eclectic approach, the importance of utilizing positive self expression can not be simply ignored. A mixture of cognitive-behavioral, systematic and analytical interventions for the first time gives the parents of these children the opportunity to assume the problem separated from their kid. They will also realize that apart from educational problems, their kids can have good and joyful relationships with others (Osmon, 1996). In another analysis of these results we can say that as children with learning disabilities are not able to meet the performance criteria of themselves, parents and teacher and experience repetitive failures, they usually utilize impulsive carelessness approach or negative orientation in dealing with a problem and this leads to self-humiliation, scolding and repetitive failures. By

teaching the Adlerian approach, the expectations of the parents will be exactly matched with their kids' capabilities and this level of awareness of their kids abilities helps parents to unanimously accept their kid. By teaching the encouragement approach, parents will have some sense of comfort and the cognitive-behavioral approach reduces paying attention to negative thoughts and scolding and humiliation of kids. This helps improve the educational, emotional and social effectiveness of these students [39]. Of the limitations of this study we may refer to selection of students from Zanzan city which limits the generalization of results to other cities. The sample of the study included just the male students of junior highschool and this makes generalization of the results to female students difficult. Considering the prevalence of this disorder in childhood and adolescence and the growing number of cases reported in therapeutic centers, conducting psychological researches associated with this social problem can help identify and solve the psychological problems of these people. It is recommended that parents' educational programs with the Adlerian approach for promoting social problem solving and identifying and expressing the emotions in schools and families be taken into consideration by psychologists and consultants. This method can also be applied to disorders that simultaneously take place with learning skills such as conduct disorder, comparative disobedience disorder and hyperactivity disorder (ADHD) and counseling centers can also use the findings of this study.

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