

Treatment of Children's Aggression by Behavioral Therapy Techniques



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Citation: Aghajari, Gh., Golestaneh, S., M., Pakizeh, A. (2017). Treatment of Children's Aggression by Behavioral Therapy Techniques. *Journal of Practice in Clinical Psychology*, 5(1), 17-26. <https://doi.org/10.18869/acadpub.jpcp.5.1.17>

doi: <https://doi.org/10.18869/acadpub.jpcp.5.1.17>

Article info:

Received: 22 Jul. 2016

Accepted: 10 Nov. 2016

Keywords:

Behavior therapy,
Reinforcement, Punishment,
Observational learning,
Aggression, Children

ABSTRACT

Objective: The present study aims at investigating the effects of behavioral therapy techniques through operant conditioning and observational learning on children's aggression aged 4-6 years.

Methods: To this end, a pretest-posttest quasi-experimental study with two experimental groups and a control group was designed. We used non-probability purposive sampling method to select 45 mothers of aggressive children out of all mothers in Deylam City, Iran. They were randomly assigned into three groups (each group included 15 participants). Primary data were collected using the questionnaire developed by Vahedi, Fathi-Azar, Hosseini-Nasab, and Moghadam (2008). To analyze the data, multivariate analysis of covariance, 1-way analysis of covariance, and Bonferroni tests were used.

Results: The results indicated that teaching operant conditioning and observational learning techniques to the mothers reduced their children's overall aggression along with its components, including verbal-offensive, physical-offensive, and relational aggression as well as impulsive anger.

Conclusion: These techniques are recommended to be used in clinical interventions to teach the families how to control their children's aggression.

1. Introduction

Over the last decade, the most common referrals of children to mental health clinics have been aggression and antisocial behavior (Connor, 2012). Aggression is defined as a deliberate behavior to harm others. In particular, aggressors believe that their actions hurt others. Aggression among children appears in various forms like

verbal calls (e.g., name-calling and slurs), disobedience, destruction, opposition, and obstinacy (Shahim, 2007).

It seems that aggression is affected by time and have high intensity and variety in specific mental developments. However, the emergence of externalized behavior at different ages doubles the necessity of planning to assess and treat these behaviors (Reebye, 2005). Otherwise, aggressive behavior as a stable personality trait

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can affect other behaviors throughout childhood and on into adulthood. The consequences of aggression are inevitably negative for both the perpetrator and the victim (Liu, 2004). For example, children who are aggressive at school are likely to be rejected by their peers. Consequently, they display poorer social skills in comparison with other children. Moreover, they expect more negative social outcomes, and therefore may behave less competently in new situations. In adults, the consequences include physical injury, psychological trauma, and financial costs. Overall, damage to the victim includes psychological and emotional trauma, particularly in response to aggressive acts such as domestic violence. There are also consequences for the perpetrator of aggression, such as financial loss, imprisonment, and even execution (Kendall, 2000).

Aggression has different types, for example, hostile aggression, which appears in the early preschool and includes both overt and relational aggression. Overt physical and verbal aggression includes aggressive behaviors such as hitting, pushing, kicking, and verbal threatening. Relational aggression is a form of aggression in which the aggressive person disturbs the friendly and interpersonal relations of the victim through using rumors and forcing others to break off contact with that person (Reebye, 2005).

Contrary to popular belief that high levels of aggression are only seen in adolescence, the literature shows that those children who are very aggressive in their early school years are often at the greatest risk of physical aggression in adolescence and adulthood (Broidy et al., 2003). Given that the aggression problem in children affects all their personal and social aspects of life, any effort to identify and treat aggression in children to improve their mental and public health seems advisable.

One of the most effective methods in the treatment of behavioral disorders in children is operant conditioning (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012). In this method, the treatment is formed around the conditioning principles. According to Skinner's active conditioning principles, if behavioral outcomes are strengthened, their occurrence probability will be increased and if not, their occurrence probability will be decreased or inactivated. Moreover, based on observational learning techniques, one imitates the model behavior or actions after observing them. Bandura (1977) believed that individuals in social situations simply acquired new behaviors performed by the model (Seif-Naraghi & Naderi, 2010).

Miranda (2000) conducted a study to examine the impact of cognitive and behavioral methods on aggression,

and showed that appropriate implementation of these methods can result in decreasing aggression in children. In another study, Danforth, Harvey, Ulaszek, and McKee (2006) trained parents based on behavioral practices to reduce children's attention deficit disorder and aggression. The results showed that training parents can reduce attention deficit disorder, aggression, and hyperactivity in children. Özabaci (2011) concluded that cognitive and behavior therapy methods can reduce anger in children. Kawabata, Alink, Tseng, van IJzendoorn, & Crick (2011) examined parenting methods and its relationship with aggression and indicated that positive parenting methods can reduce the aggression level among children.

Considering that children's behavioral problems both at home and school are of major concern for parents and teachers, and many children are unable to realize their talents and abilities because of such problems, investigating behavioral disorders of childhood as a cornerstone of normal and abnormal personality, and identifying effective treatment methods is advisable. Although a wide body of empirical research on the treatment of aggression has been conducted (Alavinezhad, Mousavi, & Boojari, 2015), very few studies have addressed it from a purely behavioral perspective. The present study reveals the effects of operant conditioning and observational learning techniques on aggression among 4-6 years old children, in particular exploring their potential effects on different components of aggression, such as verbal-offensive, physical-offensive, and relational aggression as well as impulsive anger.

2. Methods

The current quasi-experimental study includes a pre-test-posttest design with two experimental groups and one control group. The first experimental group was treated by operant conditioning technique and the second one by observational learning. Aggression level was determined based on scores obtained from aggression assessment questionnaire.

In this study, the behavior therapy was implemented using the operant behavior therapy principles and techniques, including reinforcement, extinction, time out (deprivation), compensation, response cost, and punishment in eight 90-minute sessions (Appendix A). In addition, observational learning model based on Bandura's theory was performed using modeling techniques and observing the model behavior during eight 90-minute sessions (Appendix B). Pretests were implemented for all three groups before conducting the intervention. Posttests were also implemented at the end of the study. The study popu-

lation included all 4-6 years old children of kindergartens and preschools at Deylam, Bushehr Province, Iran. They were enrolled in 2014-2015 academic year.

Based on previous studies, groups of 10-15 participants were considered appropriate for experimental studies (Sarmad, Bazargan, & Hejazi, 2015). Non-probability purposive sampling was used to select the study sample. First, a thorough list of preschools and kindergartens was prepared in the Directorate of Education and the Department of Social Welfare at Deylam. Then, out of the 12 preschools and 2 kindergartens, 7 preschools and one kindergarten were selected. In this regard, a briefing was held for therapists on how to complete the questionnaire, and adequate explanations were provided. First, 100 children were selected as the initial participants of the study. Then, 45 children who had received the highest scores on Vahedi's questionnaire were selected as the final study participants. They had scored two standard deviations above the mean score ($M + 2SD = 86 + 12 = 98$). Thus, the inclusion criterion was receiving the highest scores on the so-called questionnaire, and exclusion criterion was receiving lower scores, in other words, lacking the symptoms of aggression. The study sample consisted of 45 (mean[SD] age = 5.3[1.0] y, age range 4-6 y), male and female children. They were randomly assigned into two experimental groups ($n = 30$) and a control group ($n = 15$). The experimental group was also divided into two treatment groups treated with operant conditioning and observational learning methods ($n = 15$ per group).

The therapists were two female clinical specialists who were trained by the researcher at the beginning of the study. They were asked to fill in the Aggression Scale of Vahedi et al. (2008) for 100 children who had adequate knowledge about their behaviors. In our single-blind clinical intervention, the subjects were blind, not the raters (therapists). They were fully aware of the research hypotheses and objectives.

In this study, an aggression assessment questionnaire was used. Because no specific scale, including all aspects of aggression has been ever prepared for preschoolers, Vahedi, Fathiazar S, Hosseini-Nasab SD, & Moghaddam M, (2008) developed a questionnaire acceptable in terms of reliability and validity at children's level by using a school children aggression questionnaire, aggression questionnaire, and diagnostic DSM-IV criteria. Using the available resources and cooperating with two experienced psychologists and considering Iranian culture, they prepared a questionnaire containing 43 questions in the field of relational, physical, and verbal-reactive aggression with 5 options (0 = never, 1 = rarely, 2 = once a

month, 3 = once a week, 4 = often). This questionnaire was completed by kindergarten trainers. The questionnaire was designed based on varying degrees of aggression and ranked based on the amount of aggressive behavior. The scale total score can fluctuate between 0 and 172 (indicating high levels of aggression in children). In other words, children with an aggression score of two standard deviations above the mean (females = 117.48 and males = 125.77) are characterized as aggressive.

Based on the results, the KMO coefficient was satisfactory (KMO = 0.95). Bartlett's test of sphericity also was statistically significant at $P = 0.001$ ($X^2 = 4.11371$). Factorial analysis of principal components resulted in 6 factors with eigenvalues above 1. These 6 factors accounted for 64% of the aggression total variance.

In Vahedi's study, the Cronbach α reliability coefficients for the total scale and for 4 factors of verbal-offensive, physical-offensive, relational, and impulsive aggression were 0.98, 0.93, 0.92, 0.94, and 0.88, respectively. In general, the results showed that the aggression assessment scale can be used as a reliable and valid instrument in educational, clinical, and research settings.

After receiving the population statistics and obtaining necessary permissions from the Department of Social Welfare and the Education Department of the city, we referred to kindergartens and preschools. Within a meeting attended by mothers and educators, it was decided that the training sessions for mothers be held in the counseling center of Welfare Department. In order to observe the ethical principles, the questionnaires were coded to ensure confidentiality and be identified by their relevant codes.

After explaining the test purpose, the researcher added that participation was voluntary and refusal to participate would not result in any consequences or any loss of benefits. Then, the written consent forms were taken from the parents. Participants were trained for 8 sessions (2 sessions per week, each session lasted 90 minutes). The authors concluded that 8 sessions were adequate for successful aggression treatment since lower number of sessions is usually associated with smaller effect while large numbers are associated with increased dropout (Saini, 2009). In addition, the control group did not receive any treatment or training during this period. Children of mothers who participated in the study were pretested with regard to aggression level prior to receiving operant conditioning and observational learning therapy. After their mothers were trained by operant conditioning and observational learning methods, they were posttested in terms of their aggression level to investigate the impact of

these two methods on their aggression level. The content of the sessions was designed and conducted based on the theoretical principles of reinforcement and punishment in behavior therapy theory (Michie, Johnston, Francis, Hardeman, & Eccles, 2008) by experts in the field.

3. Results

To analyze data, the descriptive statistics such as percentage, mean, standard deviation, aggression and its components were used. Then, in inferential statistics, multivariate analysis of covariance, 1-way analysis of covariance, and Bonferroni tests were run. Table 1 presents descriptive statistics of aggression and its dimensions for all three groups.

According to Table 1, the mean scores of the aggression and its components for the operant conditioning therapy group are lower in the posttest compared to pretest. The mean scores of the aggression and its components for the observational learning group are lower in the posttest compared to pretest and the mean scores of the aggression and its components for the control group

are higher in the posttest compared to pretest, except for the relational aggression score which is the same in pretest and posttest. The results of the multivariate analysis of covariance on the aggression scores of the operant conditioning group indicated a significant difference between the experimental group and control group in terms of aggression and its components, Pillai's Trace = 0.759, $F(21,4) = 16.53$, $P < 0.0001$, partial eta squared = 0.759. We used this robust test statistic because it is not highly linked to assumptions about the normality of the distribution of the data. Based on the significant F, behavior therapy based on operant conditioning reduced aggression among 4-6 years old children. Because the multivariate analysis of covariance was significant, we used a follow-up 1-way analysis of covariance. The test was run to further investigate the observed difference and control for Type I error (incorrect rejection of a true null hypothesis) by examining each component of aggression. The results are presented in Table 2.

According to Table 2, there is a significant difference between the behavioral therapy group of operant conditioning and control group in terms of aggression and its

Table 1. Descriptive statistics of aggression and its components for all groups

Groups	Aggression Type	Pretest		Posttest	
		M	SD	M	SD
Operant Conditioning (Age = 4-6, M = 5.6 y)	Verbal-offensive	35.4	2.64	25.66	5.55
	Physical-offensive	23.2	2	16.53	3.81
	Relational	21.66	2.94	15.26	4.49
	Impulsive	13.2	2.42	9.53	2.23
	Overall	93.46	6.66	67	13.51
Observational Learning (Age = 4-6, M = 5 y)	Verbal-offensive	35.8	1.69	25.73	4.16
	Physical-offensive	22.53	2.74	16.53	2.74
	Relational	23.13	3.11	15.93	3.88
	Impulsive	12.13	0.83	8.73	1.83
	Overall	93.6	5.44	66.93	5.44
Control (Age = 4-6, M = 5.3 y)	Verbal-offensive	35.8	1.82	37.33	2.12
	Physical-offensive	24.53	1.68	25.53	1.4
	Relational	25.4	1.8	25.4	1.8
	Impulsive	12.73	1.57	13.53	1.55
	Overall	98.46	3.24	101.8	3.56

Table 2. One-way analysis of covariance for the operant conditioning group

Aggression Type	Sums of Squares	df	Mean of Squares	f	Eta Squared
Verbal-offensive	470.691	1	470.698	62.91	0.724
Physical-offensive	212.644	1	212.644	29.93	0.555
Relational	155.897	1	155.897	30.1	0.556
Impulsive	72.840	1	72.840	32.57	0.556
Overall	3283.087	1	3283.087	53.69	0.691

P<0.0001

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components ($P < 0.0001$), i.e. operant conditioning therapy has reduced aggression among 4-6 years old children. The results of the multivariate analysis of covariance on the aggression scores of the observational group indicated a significant difference between the experimental group and control group in terms of aggression and its components, (Pillai's Trace = 0.87, $F(21,4) = 35.12$, $P < 0.0001$, partial eta squared = 0.87). In other words, observational learning reduced aggression among 4-6 years old children. To further investigate each component of aggression, 1-way analysis of covariance was used. The results are presented in [Table 3](#).

According to Table 3, there is a significant difference between the observational learning group and control group in terms of aggression and its components ($P < 0.0001$), meaning that observational learning reduced aggression among 4-6 years old children. Finally, to control Type I errors across the pairwise comparisons, Bonferroni test was used. The results are presented in [Table 4](#).

According to the above table, there is a significant difference between the operant conditioning and observational learning groups' mean and the control group's mean in terms of aggression and its components but there is no significant difference between the operant conditioning and observational learning groups in terms

of aggression and its components' score on their post-tests. In other words, both operant conditioning and observational learning techniques had the same effect on aggression and its components.

4. Discussion

With regard to the aforementioned features of aggression, behavioral techniques were taught to mothers (Appendix A). It seems that, based on the principles of behavior therapy, understanding and implementing these techniques which result in reducing aggressive behavior in children have helped the mothers to enhance their aggression control skills and accordingly decrease aggression in children.

Considering the variety of techniques taught to mothers and the implementation of these techniques, reducing aggression in children is not unexpected. Based on the cognitive-social theory, individuals' actions are not only caused by the environment but also based on their conditions affected by their thoughts and feelings. Accordingly, it is recommended that mothers provide a desirable condition in their families with an emotional and interactive atmosphere to adjust the aggressive behavior in their children.

The results of multivariate analysis of covariance and 1-way analysis of covariance, and Bonferroni test on the

Table 3. One-way analysis of covariance for the observational learning group

Aggression Type	Sums of Squares	df	Mean of Squares	f	Eta Squared
Verbal-offensive	470.691	1	470.698	62.92	0.732
Physical-offensive	212.644	1	212.644	29.93	0.842
Relational	155.897	1	155.897	30.11	0.699
Impulsive	72.840	1	72.840	32.5	0.651
Overall	3283.087	1	3283.087	53.69	0.828

P < 0.0001.

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Table 4. Pairwise comparison of the three groups based on the observed means

Dependent Variable	Group (I)	Group (J)	Mean Difference (I-J)
Verbal-offensive	Operant conditioning	Observational learning control	-0.06667 -11.66667*
	Observational learning	Operant conditioning control	0.06667 -11.60000*
	Control	Operant conditioning observational learning	11.66667* 11.60000*
Physical-offensive	Operant conditioning	Observational learning control	0.00000 -9.00000*
	Observational learning	Operant conditioning control	0.00000 -9.00000*
	Control	Operant conditioning observational learning	9.00000* 9.00000*
Relational	Operant conditioning	Observational learning control	-0.66667 -10.13333*
	Observational learning	Operant conditioning control	0.66667 -9.46667*
	Control	Operant conditioning observational Learning	10.13333* 9.46667*
Impulsive	Operant conditioning	Observational learning control	0.80000 -4.00000*
	Observational learning	Operant conditioning control	-0.80000 -4.80000*
	Control	Operant conditioning observational learning	4.00000* 4.80000*
Overall	Operant conditioning	Observational learning control	0.06667 -34.80000*
	Observational learning	Operant conditioning control	-0.06667 -34.86667*
	Control	Operant conditioning observational learning	34.80000* 34.86667*

*The mean difference is significant at 0.05 level.

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posttest scores with controlling the pretest scores of aggression and its components (verbal-offensive, physical-offensive, relational, and impulsive aggression) showed that the mean scores of aggression and its components for participants in the operant conditioning group are lower than those of the control group. In other words, operant conditioning therapy method decreases aggressive behavior in 4-6 years old children. The results of this study agree with those of [Anderson and Bushman \(2001\)](#), [Huesmann and Taylor \(2006\)](#).

According to observational learning theory, one imitates a behavioral model after observing it. In many cases, our learning is obtained from observing the be-

havior of others and observing the consequences of their behavior. Observational learning can include imitation or modeling in which one copies the behavior of a selected model or pattern. Learning is more complex than observation and requires to be reinforced or be replaced via punishment ([Miranda, 2000](#)).

Bandura has defined three basic models of observational learning: 1) an individual model demonstrating or acting out behaviors, 2) a verbal instructional model describing and explaining behaviors, and 3) a symbolic model displaying the behaviors of real or fictional characters of books, movies, TV programs, or online media. Hence, during these sessions, the mothers were instruct-

ed to daily use reinforcement and punishment alternatives as a model and an example of observational learning at home, and monitor their role in their children's aggression levels. They were also instructed to verbally describe and explain adequate alternatives to the aggressive behavior and to purposefully employ symbolic methods such as stories, movies, and cartoons to reduce aggression in children.

It seems that these instructions have enhanced the capabilities of the mothers in reducing more effectively the children's aggression. On the other hand, based on the principles of social learning theory, the aggressive children were affected by the behavioral changes when interacting with their mothers. In other words, the techniques taught to mothers along with their implementation at home and while interacting with their children, as well as the use of the stories, movies, and cartoons could reduce the aggressive behavior (verbal, physical). Accordingly, the effect of observational learning behavior therapy on reducing aggression in children is not surprising.

According to the Bonferroni test results, although there was a significant difference between the operant conditioning and observational learning groups' mean and the control group's mean in terms of aggression and its components, no significant difference was found between the operant conditioning and observational learning groups in terms of aggression and its components' scores on their posttests. Putting it differently, both operant conditioning and observational learning techniques had the same effect on aggression and its components.

It should be noted that controlling all intervening variables was not possible in the current quasi-experimental study. Therefore, the participants might be influenced by uncontrolled conditions. Considering that only 4-6 years old children of kindergartens and preschools were investigated, generalizing the findings to children in different contexts should be done cautiously until more research is done to compare findings from various other settings. In addition, the data collection instrument was a questionnaire; therefore, the participants' attention to respond to the questions was not evident to the researcher.

Conducting similar studies in other provinces and comparing the results are recommended. In future studies, it would be better to teach behavioral therapy techniques of operant conditioning and observational learning to fathers of 4-6 years old aggressive children and compare the results with the findings of the current study. Regarding teaching behavioral therapy techniques of operant

conditioning and observational learning, the impact of gender can also be investigated.

Acknowledgments

This article is part of the first author's MSc. thesis, Department of Psychology, School of Humanities, Boushehr Branch, Islamic Azad University, Boushehr.

Conflict of Interest

The authors declared no conflict of interests.

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Appendix A. Summary of the intervention sessions hold for the operant conditioning group:

Session No.	Activities
1	Warm-up for 10 minutes, introducing the members to each other, discussing the purpose of the study, overviewing the primary regulations of the sessions, explaining the concept of reinforcement and its varieties
2	Teaching positive methods to reduce aggressive behaviors, including reinforcing desired behaviors performed with lower frequency and reinforcing other desired behaviors
3	Teaching positive methods to reduce aggressive behaviors to mothers, including reinforcing behaviors contrary to and incompatible with undesirable behavior and teaching satiation techniques (to stop aggression)
4	Teaching the extinction techniques
5	Teaching time out (deprivation) and response cost techniques
6	Teaching the negative methods to mothers to reduce aggression, including compensation and punishment techniques
7	Teaching new behavior establishment techniques and aggression replacement, including behavior shaping techniques, along with reviewing previous sessions' assignments
8	Teaching behavior techniques and procedures, reviewing the assignments and previous sessions' topics with other participants, and providing feedback

Based on Michie et al. (2008).

PRACTICE in
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Session No.	Activities
1	Warm-up for 10 minutes and introducing the members to each other, discussing the purpose of the study, an overview of the primary regulations of the sessions, introducing Bandura's social learning theory, focusing on the importance of observation in learning new behavior, and reducing aggression in children
2	Providing the necessary training to create appropriate emotional and interactive climate for children at home
3	Teaching modeling process to the mothers to be a model for their children
4	Introducing vicarious and personal reinforcement and punishment and their role in observational learning as well as covert modeling principle
5	Introducing symbolic models in stories
6	Introducing symbolic models in stories to practice observational learning
7	Introducing symbolic models in movies (using acquisition and disinhibition principles) along with reviewing previous sessions' assignments
8	Introducing symbolic models in cartoons (using acquisition and disinhibition principles), reviewing the assignments and previous sessions' topics with other participants and providing feedback

Based on Michie et al. (2008).

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