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The Effects of Modeling and Intelligence Interventions on Disruptive Behaviors in Children

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The purpose of this study was to determine the effects of modeling interventions and the level of intelligence on children's disruptive behavior. Sixteen (16) preschool children were selected as participants and divided into two groups: 8 children in the control group and 8 children in the experimental group. The data collection instruments utilized here were: (1) observation, and the scale of disruptive behavior to accumulate data on children's disruptive behavior, (2) Colors Progressive Matrices (CPM) test to measure the level of intelligence category was used. The modeling intervention consisted of two types, namely live-modeling and symbolic modeling. This study used a quasi-experiment.

Key words: *intervention, live-modeling, symbolic modeling, intelligence, children's disruptive behavior.*

Introduction

Disruptive behavior in early childhood is characterized by aggression and behavior opposing rules demonstrated both physically and verbally. Disruptive behaviors include attention-deficit/hyperactivity disorder (ADHD), oppositional defiant disorders (ODD), and conduct disorders (CD). The impact of disruptive behavior can vary, from weakening the functioning of children in the mild to severe categories. If it is not immediately treated, it can lead to more serious behavioral abnormalities, characterized by aggressive unlawful behavior and abusive behavior, inability to control emotions (control of anger), and behavior that tends to

oppose prevailing norms in the DSM IV-TR community (American Psychiatric Association, 2014). Children who are impulsive and egocentric risk having disruptive behavior (DeVito, 1997). Disruptive behavior in education can inhibit children's participation in educational activities, keep them away from their peers, endanger themselves and other friends physically, affect the continuity of the learning process, and other individual functions. These conditions require serious handling from the school.

Cases of disruptive behavior in childhood often do not receive serious treatment because there is a large tolerance from the environment that assesses that it is normal for children to behave inappropriately. This is because children are still at the age of recognizing environmental rules, so it is natural to show resistance when given a task. The facts show that improper behavior, which at first was considered normal, actually had a negative impact on the child's subsequent functions (Pallett, 2005). Parents' education and personality have effects on/ relationship with child disruptive behavior and the need-aggression aspect has the strongest effect on the child disruptive behavior than the other aspects such as need-dominance, and need-deference (Purwati & Muhammad Japar, 2017). Of the cases that are handled professionally, it is known that some of the children had experienced the category of severely weakened functions. 15% of children aged 2–6 years who are diagnosed with disruptive behavior, with oppositional defiant symptoms, only 3% are no longer classified as a group of students at risk in Elementary School. During follow-up examinations, of the 12% of ODD and CD cases in elementary school, 6% of them were of the severe category. Children disruptive behavior can be an early diagnosis of the possibility of Conduct Disorder (CD) or antisocial behavior in teenager ages.

Social Cognitive Deficit has a substantial impact on social functions (Pinkham, Penn, Green, & Harvey, 2016; Aldulaimi, 2018). Social cognition is defined as a mental operation that plays a role in the process of understanding, interpreting, and producing responses during social interactions, including intentions, and behavior of others. One of the actors causing the emergence of disruptive behavior in early childhood is inadequate and bad supervision by parents, rude and inconsistent discipline, rejection, and the lack of closeness to parents (Hairina, Kumara, & Gusniarti, 2017).

Hilt (2011) has discussed the treatment of behavioral disorders in children. He makes the case that the most effective way to treat this disorder is by modifying how other people respond to children's behavior, through strategies such as educating parents on how to use behavioral management techniques. In the absence of comorbidities that are responsive to drugs, chemical treatments to deal with disruptive behavior in children should be avoided.

Based on the cases above, it appears that the emergence of disorder behavior in early childhood was caused by the lack of adaptive learning processes, that is, by modeling inappropriate behavior. Modeling is a process through which the observer tries to imitate the behavior displayed by someone else; the behavior which the model performs is often thought to be the optimal way to achieve the goal of the movement. The modeling process has been studied by various researchers, (Albert Bandura, 1986). Based on the perspective of social learning theory, modeling is one form of intervention which uses the observation process and the learning process. In the modeling process, besides the classical conditioning process, there is also the existence of cognitive processes. This means that after the observation process the individual will encode and process the information received (Encyclopedia of Mental Disorders, 2018). The modeling process consists of an attentional process, which is observing the stimulation of the model, a retention process that is cognitive processing, where there is a process of coding the observed behavior, the motor reproduction process which is a physical ability to respond, and a motivational process which is a reinforcement within oneself.

Modeling proved to be effective for short-term memory, modeling will work well if combined with role-playing and reinforcement. Reinforcement, in this case, is an appreciation of one's achievements (Encyclopedia of Mental Disorders, 2018). The results showed that modeling is an efficient method to teach motor skills to children (Hamidreza Taheri-Torbati & Mohammad Saber Sotoodeh, 2019). It can be concluded that modeling should be used as a technique to teach and improve motor skills learning to children. In the Modeling process, there is a cognitive function that plays a role in processing the information received. One of the measures of cognitive functioning is seen from the IQ score category. Research by Frazier et.al. found that the higher a person's IQ score, the lower the amount of behavioral problems at home and at school (Frazier, Youngstrom, Glutting, & Watkins, 2007). Children who have an IQ score in borderline categories tend to experience behavioral and personality problems (Gunderson, 2009; Akgun, & Tektufekci, 2017). This study focuses on the influence of modeling intervention and the level of intelligence on disruptive behavior in early childhood. This study aims to examine whether there are differences in the level of disruptive behavior in early childhood who received modeling intervention (live-modeling and symbolic modeling) and intelligence categories, as well as interactions between the two.

Methods

Research Subject

The population in this study were 250 preschool students consisting of 150 girls and 100 boys. The selection of the research sample was implemented through purposive sampling

technique where the researchers set criteria for the research sample. The research sample criteria were children aged 5-6 years, and the measurement results of the children's disruptive behavior by using the instrument in the posttest fell under high score categories.

The research sample consisted of 16 children, eight of whom were designated as the control and the others were designated as the experimental group.

Research Instrument

The instruments used in this study were intelligence tests, namely CPM (Colors Progressive Matrices) tests and instruments for children's disruptive behavior. The results of the test show that the instrument validity of the scale of disruptive behavior in children was of 0.927 and have the reliability of 0.962, which indicates that the instrument has good reliability and validity.

Research Design and Procedures

Intervention / ***Intelligence***	**Intervention**	
	live-modeling (LM)	**symbolic modeling (SM)**
Above average (AA)	LMAA	SMAA
Average (AV)	LMAV	SMAV

This study used a 2x2 factorial design experimental method. This study involved three variables. The first independent variable is the provision of modeling interventions, which include direct observation (live-modeling), which is observing and imitating the behavior of people or figures that are evidently imitated, and symbolic modeling, that is seeing images of the figures which are significantly imitated. The observed actions than can be imitated (Albert Bandura, 1986).

The second independent variable is the attribute variable, where the variable cannot be manipulated, or in other words, the inherent variable, which is the characteristic of the subject of this research, is the level of intelligence. The dependent variable in the study is the child disruptive behavior. Modeling intervention was given to the experimental group, whilst the control group would get the same intervention after the research process was completed. This study consists of 3 stages:

Stage 1: the stage where the research sample is selected at the same time as the pretest which is using observation and disruptive behavior scale.

Stage 2: the stage of determining the control group and the experimental group. The research subjects who meet the criteria then undergo the intelligence level tests, namely CPM tests (colors progressive matrices). The CPM test results showed that in the experimental group, four children (2 males and 2 females) had intelligence levels of above the average, and four children (2 males and 2 females) had intelligence levels of the average category. The same result is also obtained from the control group.

Stage 3: the experimental group received the live-modeling intervention or direct observation by imitating real people's behavior, there are 13 meetings followed by giving symbolic modeling interventions that are seeing the figure's image from the movie for 13 meetings.

Result

Pretest

Pretest statistical analysis results (Table 1 below) with ANOVA shows the first result was that there was no difference in disruptive behavior in children before getting modeling intervention (live-modeling and symbolic modeling), which was indicated by F=0.565, P>0.05. Second, there is no difference in disruptive behavior between children who have above-average and average intelligence categories before getting an intervention, indicated by F=3.076, P>0.090. Third, there was no difference in disruptive behavior as a result of the interaction between the intervention and the intelligence category before getting the treatment, indicated by F=2.260, P>0.05.

Table 1: Pretest with ANOVA

Source	Sum of Square	df	Mean Square	F	Sig.
Corrected Model	11.750	3	3.917	1.967	0.142
Intercept	82824.500	1	82824.500	41597.955	0.001
Modeling	1.125	1	1.125	0.565	0.459
IQ	6.125	1	6.125	3.076	0.090
Modeling*IQ	4.500	1	4.500	2.260	0.144

Table 2 below shows that the disruptive behavior in the live modeling group of children of the early childhood before the intervention, was slightly higher than the symbolic modeling group (the mean value of disruptive behavior of the live modeling group before intervention was 51.063, whilst the symbolic modeling group before intervention was 50.688, and the

difference was not significant). The disruptive behavior in children with an intelligence category above the average, it is slightly lower than children with an average intelligence category (the mean of disruptive behavior in children with an intelligence above the average was 50.438, whereas in children with average intelligence category was 51.313), but the difference is not significant (Table 3 below).

Table 2: Disruptive Behavior in the Intervention Groups of Live Modeling and Symbolic Modeling before Intervention

Modeling	Mean	Standard Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Live Modeling	51.063	0.353	50.340	51.785
Symbolic Modeling	50.688	0.353	49.965	51.410

Table 3: Disruptive Behavior in Children with Intelligence Categories above the Average and Average before Intervention

Modeling	Mean	Standard Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Live Modeling	50.438	0.353	49.715	51.785
Symbolic Modeling	51.313	0.353	50.590	51.410

Posttest

The results of the analysis (Table 4 below) show that there are differences in the level of disruptive behavior in early childhood after obtaining the modeling intervention as indicated by F=166.732, P<0.05. There is a difference in the level of disruptive behavior in early childhood based on the level of intelligence category which is equal to F=143.362, P<0.05. Subsequent results showed that the interaction of modeling intervention with intelligence levels resulted in differences in the level of disruptive behavior in early childhood as indicated by F=6.669, P<0.05.

Table 4: Post-test with ANOVA

Source	Sum of Square	df	Mean Square	F	Sig.
Corrected Model	718.375	3	239.456	105.967	0.001
Intercept	60726.125	1	60726.125	26776.125	0.001
Modeling	378.125	1	378.125	166.732	0.001
IQ	325.125	1	325.125	143.362	0.002
Modeling*IQ	15.125	1	15.125	6.669	0.015

Table 5 below shows that the mean of disruptive behavior in early childhood treated with live modeling intervention was lower than the one treated with symbolic modeling intervention. The mean of disruptive behavior with live modeling intervention = 40.125; while the average with symbolic modeling = 47.000.

Table 6 below shows that early childhood with an IQ above the average, the mean of their disruptive behavior is only 40.375, whilst the children with an average IQ, their disruptive behavior mean is 46.750. Based on the results of the analysis, it can be argued that children with IQ above average have lower mean of disruptive behavior than the children with an average IQ.

Table 5: The Mean of Disruptive Behavior in Live and Symbolic Modeling Intervention Groups after Intervention

Modeling	Mean	Standard Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Live Modeling	40.125	0.376	39.354	40.896
Symbolic Modeling	47.000	0.376	46.229	47.771

Table 6: Disruptive Behavior in Children with IQ above the average and the average After Intervention

Modeling	Mean	Standard Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Live Modeling	40.375	0.376	39.604	41.146
Symbolic Modeling	46.750	0.376	45.979	47.521

Pretest and Posttest Results

The results of the analysis showed that after receiving the intervention, there were differences in disruptive behavior between children who received the observational learning and symbolic modeling F=166.732, P<0.05 (Table 2). The mean of the disruptive behavior before intervention in the live modeling group was 51.063, while in the symbolic group it was 50.688. The mean of the disruptive behavior in children decreased after being treated by an intervention, the mean of disruptive behavior in children with the live modeling group dropped to 40.125, while in the symbolic modeling group it was 47.00. These results are reinforced by the results of the t-test as shown in Table 7 below. The results of the t-test showed that there were differences in disruptive behavior before and after receiving intervention with live modeling (t=9.071 with p<0.05), therefore, disruptive behavior in children had decreased after receiving the intervention. There are differences in disruptive behavior before and after receiving symbolic modeling intervention, with this the disruptive behavior in children had also decreased after receiving symbolic modeling intervention.

Table 7: T-Test Results of Pre-Post Test Scores of the groups with Live Modeling and Symbolic Modeling Intervention

			95% Confidence Interval			
Source	Mean	SD	of the Difference		T	Sign.
			Lower	Upper		
Pre-Posttest disruptive	10.938	4.823	8.367	13.508	9.071	0.001
Behavior LM						
Pre-Posttest disruptive	3.688	2.120	2.558	4.817	6.956	0.001
Behavior SM						

Disruptive behavior in the observational learning and symbolic modeling groups before the intervention showed that there was no difference between children who had IQ above average with children who had an average IQ category (F=3.076 with p>0.05). After receiving an

intervention, there were differences in disruptive behavior between groups of children with IQ categories above average with groups of children with an average IQ ($F = 143.362$ with $p<0.05$). The mean of disruptive behavior in children with IQ above average was 50.438. Whereas in children with an average IQ was 51.313, the difference is not significant. After the intervention, the mean of disruptive behavior in early childhood who had IQ above average decreased to only 40.375, whilst the children with an average IQ, the mean of disruptive behavior decreased to 46.750.

Discussion

Based on the data obtained, a decrease in the level of disruptive behavior in early childhood who get a modeling intervention consisting of live-modeling and symbolic modelling is evident. The group of children who received live-modeling showed a significant decrease compared to the group of children who received symbolic modeling treatment. This is similar to Bandura & Mischel's findings (1965), which state that live-modeling has a more significant influence on self-control than symbolic modeling, and that live-modeling had also been proven to affect the social behavior in children with autism (Taylor & DeQuinzio, 2012). Live-modeling can influence the creativity and motivation of individuals to do things according to objects that are directly observed (Groenendijk, Janssen, Rijlaarsdam, & Van den Bergh, 2013). In these studies, the live-modeling method involves presentation of visual media images. Visual media images are the most effective media because they can stimulate visuals so that observers are able to provide appropriate responses (Greenwald & Albert, 1968). An effective live-modeling process must pay attention to the conditions of the learning environment, Therefore, the observers are able to store and convert information into memory and can translate it conceptually, and then action appears and motivated to do so (Groenendijk et al, 2013). The live-modeling process is more effective because, according to cognitive theory the way human cognitive systems work best is by learning to observe or imitate what is done, said or written by other people. It is far more effective when the individual is asked to compile his own knowledge through observation and modelling (Paas, Renkl, & Sweller, 2003; Paas, Renkl, & Sweller, 2004) as found when the group of children who received the symbolic modeling did not experience a significant decrease. In line with Kumst & Scarf (2015) who stated that the symbolic modeling in the form of storytelling in three years old children, aimed at increasing self-control, shows that there are no significant changes, due to the limited vocabulary of the children, which makes it difficult for children to understand despite the modelling. Children's cognitive capacity will also influence how the child manages the information obtained.

Based on the results of the intelligence category, it is found that the group of children who have a category of intelligence above average and who also received live-modeling treatment, showed a significant decrease in disruptive behavior, while in a group of children with average intelligence category, the decreases were not significant. In the modeling process, the individual will encode and process the information received (“The Gale encyclopedia of mental disorders,” 2013). Cognitive function has a role in processing information, therefore, in the groups of children who have above average intelligence categories, it will be easier to process the information received compared to the groups of children who have an average

intelligence category. In addition to influencing the information process, cognitive capacity also affects individual academic performance (Yen, Ko, Yen, Wu, & Yang, 2007).

Conclusions and Recommendations

The results of this study indicate that there is a decrease in disruptive behavior in children after an intervention in the form of live-modeling and symbolic modeling. The group of children who received an intervention in the form of live-modeling showed a significant decrease in disruptive behavior compared to the group of children who received interventions in the form of symbolic modeling. For children who have above average intelligence categories and received the live-modeling intervention, the decrease in behavioral disorders was greater than the group of children with an average intelligence category, even though the decreases were not significant.

Recommendations:

The next researchers conduct a study with regard to potential further research that could investigate

1. The participants' intelligence level categories which are expected to be more varied and represent each category.
2. The instruments for measuring the intelligence level which can utilize more complex instruments.
3. The addition of the use of a digital platform to provide interventions to determine the effect of technology in reducing disruptive behavior

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