

# Use of Rewards and Punishments to Reduce Aggressive Behavior in Early Childhood Children at Xavier Kairagi Catholic Kindergarten

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## ABSTRACT

The implementation of rewards and punishments as a strategy to reduce aggressive behavior in early childhood was examined at Xaverius Catholic Kindergarten Kairagi. Within this setting, there were two children who frequently disrupted their peers during learning and play activities. These children often exhibited aggressive actions, such as hitting and pinching their friends. Although the teacher had made efforts to address these behaviors - primarily through verbal reprimands and disciplinary measures, such as prohibiting the children from sitting near their peers - these attempts were not effective. Such behavior not only harms the children themselves but also hinders the learning experience of their peers.

To address this issue, specifically the behavior of pinching and hitting, the researcher implemented a strategy involving the use of rewards and punishments to reduce aggressive behavior in early childhood. The central research question of this study was: Can the application of rewards and punishments reduce aggressive behavior in early childhood at Xaverius Catholic Kindergarten Kairagi? The objective of this research was to explore the effectiveness of rewards and punishments in

decreasing aggressive tendencies among young children.

The study employed a single-subject experimental design (single-subject research) with an A-B-A-B pattern. Data collection methods included interviews, observations, and document analysis. The participants of the study were the two aggressive children identified earlier. Data analysis involved plotting the findings on an A-B-A-B research graph, distinguishing between baseline and intervention phases (A1 and B1), as well as between the initial baseline and the second intervention phases (A1 and B2). Through graph analysis, changes in behavior level, trend stability, and overlapping data were assessed to evaluate the impact of applying rewards and punishments with an interval schedule on aggressive behavior.

The results indicated that the implementation of rewards and punishments successfully reduced aggressive behavior in both subjects. However, some aggressive behaviors reappeared after one, two, and three weeks without intervention. The researcher recommends replicating this study with other children exhibiting aggressive behavior to confirm the broader applicability of rewards and punishments as an approach to reducing aggression in early childhood, particularly among kindergarten children aged 3–4 years in North Sulawesi.

**Keywords:** reward, punishment, aggressive behaviour

## INTRODUCTION

Early childhood represents a critical and foundational phase in the overall trajectory of human development. This stage, often referred to as the "golden age," is marked by a significant acceleration in the development of intelligence—up to a 50% increase during this period. At this time, both physical and psychological functions mature rapidly, allowing children to respond effectively to environmental stimuli. This stage serves as a vital period for establishing the groundwork for various developmental domains, including physical growth, cognitive skills, language acquisition, artistic expression, socio-emotional abilities, self-discipline, spiritual values, self-concept, and independence (Isjoni, 2011:19).

Children in early childhood undergo substantial developmental changes. The formation of visual capabilities typically occurs from birth to age two, which is also considered a critical period for emotional regulation and the formation of behavioral patterns in response to new experiences. Language skills are most readily acquired during this time, with cognitive development beginning to emerge in the second year of life. By age four, children start to grasp quantitative concepts, followed by further advancement in higher cognitive functions. Social development also accelerates around age three and continues through the end of the sixth year (Jalal, 2009).

Hurlock (2004) identifies a range of behaviors typical in children aged 2–6, including both social and non-social patterns. Non-social behaviors may include negativism, domineering tendencies, egocentrism, and aggression. Buss (1961) defines aggression as any behavior intended to harm others, while Geen (2001) highlights that aggression is not limited to observable acts but includes underlying components such as intent and victim motivation. Bee & Mitchell (1984) further

suggest that aggressive behavior in children often emerges during peer conflicts, manifesting as hitting, biting, pushing, kicking, or pinching.

Research by David Setyawan (2018), referencing Albert Bandura's findings, demonstrates that children may acquire aggressive behaviors by observing violence in the media. Bandura's social learning theory posits that children learn by modeling or imitating adults' behaviors. Children exposed to aggressive models are more likely to exhibit similar behaviors during peer interactions. Furthermore, aggressive behavior has been linked to broader psychological issues such as narcissistic personality disorder (Fitriyah & Purwoko, 2018) and self-injurious behaviors (Tang et al., 2013), indicating that aggression in early childhood can serve as an early indicator of deeper psychological concerns.

Based on observations and interviews conducted with teachers and parents at Xaverius Kairagi Catholic Kindergarten, two children were identified as exhibiting frequent aggressive behaviors, particularly hitting and pinching their peers during play and learning activities. Although teachers had attempted to manage these behaviors through verbal reprimands and disciplinary actions—such as restricting the children's proximity to their classmates—these strategies proved ineffective. The persistence of such behaviors not only negatively affects the development of the children involved but also disrupts the learning environment for others.

Given this situation, the researcher collaborated with teachers, the school principal, and the parents of the children to agree on a targeted intervention strategy. They collectively decided to address the aggressive behaviors—specifically hitting and pinching—through a structured and consistent application of rewards and punishments. This study, therefore, aims to examine the effectiveness of implementing a reward-and-punishment system in reducing aggressive behavior among young

children at Xaverius Kairagi Catholic Kindergarten.

The theoretical framework for this study draws on behavior modification principles. According to Cooper et al. (1987), "time-out" refers to the temporary removal of access to positive reinforcement, which can lead to a reduction in undesirable behavior. Supporting this, research by Erianny and Marlina (2016) demonstrated that time-out procedures effectively reduced hyperactive pacing in children with autism. Additionally, positive reinforcement, as outlined by Sulzher-Azroff (1992), refers to any consequence that strengthens a specific behavior. This reinforcement can take various forms—such as praise, smiles, tangible rewards, or food—and its effectiveness is determined by the behavioral impact it produces.

In behavior management, reinforcement schedules are often designed for infrequent behavioral targets. For instance, Tombokan (2013) describes an intervention where children receive reinforcement only if inappropriate behaviors, such as swearing, do not occur within a designated time frame (e.g., three incidents within five minutes). Over time, the interval between reinforcements can be extended to prevent dependency on external rewards.

Thus, through the systematic and responsible application of rewards and punishments, this study seeks to evaluate the extent to which such behavioral interventions can mitigate aggressive tendencies in early childhood educational settings.

Based on the researcher's observations and interviews with teachers and parents, there were two aggressive children. These children frequently hit and punch their friends while they were playing. Teachers have attempted to address the children's aggressive behavior. To address the children's aggressive behavior, teachers have used verbal reprimands and punishments such as children not being allowed to sit near their friends. However, these efforts have been unsuccessful. This

aggressive behavior is very detrimental not only to the children themselves but also to their friends, preventing them from learning effectively. The use of rewards and punishments has been proposed as an effective approach to reducing aggressive behavior in early childhood. This method involves giving rewards for desired behaviors and punishments for undesirable behaviors. This concept is derived from the operant conditioning theory developed by B.F. Skinner, which emphasizes that behavior can be modified through positive and negative reinforcement. Rewards are given to encourage good behaviors such as sharing, understanding friends' feelings, or following classroom rules, while punishments are given to suppress undesirable behaviors, such as aggression or antisocial behavior. This method can help children learn to interact more positively in social settings (Fitriyani, 2019). One behavior modification procedure to reduce deviant behavior is the time-out procedure. However, using this procedure alone is often ineffective; therefore, it is recommended to combine it with positive reinforcement (Cooper et al. 1987: 391). Positive reinforcement can be given in the form of verbal (praise), concrete materials, smiles, or food, but the definition of positive reinforcement should be determined by its effect (Sulzher-Azroff, 1992).

Etymologically, "reward" means a gift, reward, recognition, or imbalance. Terminologically, "reward" refers to an educational tool used to provide something to a child who has performed a good deed or achieved a specific developmental goal, thereby fostering greater motivation (Rosyid & Abdullah, 2018). Rewards or rewards are tools used by educators to make children feel happy to receive appreciation for their actions. Basically, children will know that the actions that cause them to receive good rewards. These rewards or rewards are given not only to find the results of the efforts achieved, but also the process of the results of good abilities and hard work of students (Purwanto, 2016). In B.F. Skinner's

experiments, it was shown that rewards are a form of positive reinforcement. Reinforcement means strengthening a response (increasing its speed), and positive reinforcement means strengthening responses by adding positive consequences such as food, praise, or attention (Crain, 2007) Skinner said that punishment is “the most common control technique in modern life. In a lesson, educators do not want their students to act aggressively, instead focusing more on praise and attention when they are calm and cooperative. Therefore, the classroom becomes calm (Crain, 2007) Basically, Punishment Theory is a method given to increase desired and undesirable behavior (Zuhri, 2020). Punishment is implemented in order to discipline students to the established rules. According to Maslow, the award is one of the essential conditions that encourage individuals to realize themselves. Meanwhile, according to Goodman, giving awards to children must be based on the idea that giving awards will encourage them to be better and help them avoid doing things that society does not want (Uno, 2013).

Aggressive behavior is a common behavior in children. Aggressive behavior can be defined as any visible behavior that can result in harm to oneself or others (Sukhodolsky et al., 2016). It is known that children with higher levels of aggression have lower levels of social adaptation than children with lower levels of aggression; and there is a tendency for problem behavior to increase as children age (Hong & Rho, 1983; Kim, 2010; in Yang-Gyeong et al., 2015).

Psychologically, aggressive behavior tends to be directed at something perceived as disappointing, obstructing, or hindering. This behavior occurs during development, because it is during this period that children begin to feel curious and want to do what they want, even without realizing that their actions can have a negative impact on themselves or others (Hurlock, 1987). Disruptive behavior in children, such as aggression, is one of the most common

reasons for outpatient mental health referrals (in Sukhodolsky et al., 2016). Aggressive behavior in children occurs when they feel threatened, angry, upset, or frustrated. Aggressive behavior is actually a normal reaction in young children. Children instinctively display this behavior when they feel uncomfortable, when they want to protect themselves, or when they want to achieve a certain goal but don't know how best to achieve it. Furthermore, aggressive behavior is also a typical way for young children to show others that they dislike what others are doing to them. However, as they grow older, children should become increasingly able to use more appropriate methods to achieve their goals, so there is no need to act aggressively. Aggressive behavior is part of their developmental stage and often causes problems, whether at home, school, or in institutions where they interact, especially with other people. It is hoped that by the age of 7, children will be better able to control themselves and not solve problems with aggressive behavior. Aggressive behavior in children has been shown to have weak verbal abilities, poor conflict resolution skills, and deficits in friendship skills (Deater-Deckard, 2001; in Sukhodolsky, 2016).

Research has shown that children from lower socio-economic backgrounds are more likely to exhibit aggressive behavior (Berg et al., 2011). According to Gusniar and Aulia (2020), aggressive behavior refers to feelings of anger or hostility expressed through actions directed at others, either physically, verbally, or through facial expressions and body movements that are threatening or demeaning. Such behaviors are often formed through learning or modeling from the surrounding environment, whether through direct experience or by observing others (Sholichah, 2020).

Rosmalia Dewi (2005) identifies aggressive behavior as one form of social development disorder in children. In kindergarten-aged children, aggression can manifest in physical forms such as pushing, hitting, or

fighting (Sutadi & Deliana, 1996). This type of behavior should not be left unaddressed. If children are allowed to persist in aggressive actions without proper intervention, they risk being feared or disliked by their peers (Sutadi & Deliana, 1996).

Aggression can take verbal or non-verbal forms and is often used to express hostility (Dewi, 2005). Bruno (as cited in Pristiwaluyo & Sodik, 2005) explains that aggressive behavior occurs when one organism attacks another. Hurlock (1978) defines aggression as an overt act or threat of hostility, typically not provoked by others. Physical or verbal attacks on others are expressions of an aggressive attitude, often directed at younger peers. According to Rita Eka Izzaty (2005), aggressive behavior is an intentional act aimed at achieving a desired goal, whether to defend oneself or to overpower others. In early childhood, aggression may take both verbal and physical forms. Izzaty further emphasizes that aggressive behavior must be addressed promptly to prevent it from becoming a persistent pattern.

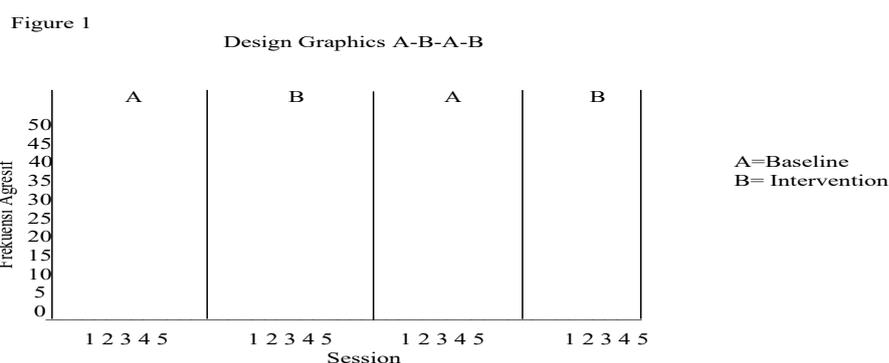
Based on this background, the present study is limited to investigating "the use of rewards and punishments to reduce aggressive behaviors such as pinching and

hitting peers." The research question is formulated as follows: "Can the use of rewards and punishments reduce aggressive behaviors such as pinching and hitting peers in early childhood at Xaverius Kairagi Catholic Kindergarten?" The purpose of this study is to explore and describe the effectiveness of implementing a reward and punishment system in reducing aggressive behaviors—specifically pinching and hitting—among early childhood students at Xaverius Kairagi Catholic Kindergarten.

## MATERIALS & METHODS

### Research Design

This study employs a single-subject research (SSR) design, an experimental approach that emphasizes individual performance rather than group-based outcomes. Such a design has been nationally recommended for use by kindergarten and special education teachers in conducting classroom-based research (Juang Sunanto, 2007). The present study specifically adopts an A-B-A-B design, which serves as a foundational model for withdrawal or reversal designs (Tawney & Gast, 1984, p. 197). Figure 1 provides a visual representation of the core procedures involved in this design.



The A-B-A-B design is considered a form of "equivalent time sampling" (Campbell & Campbell, 1982). According to Tawney and Gast (1984), the implementation of the A-B-A-B design involves the following steps: (1) collecting data on the target behavior during

the initial baseline phase (A1), in which no intervention is applied; (2) once the baseline data stabilizes, introducing the intervention phase (B1) and continuing data collection until a clear change in behavior and condition is observed; (3) withdrawing the

intervention and returning to a second baseline phase (A2); and (4) reintroducing the intervention in a second intervention phase (B2).

### **Research Procedure**

Following an agreement reached with the school principal, classroom teachers, and the children's parents, a behavioral intervention plan was developed. The research procedure consisted of the following stages:

#### **1. Baseline Data Collection (Condition A1):**

In this initial phase, no intervention was applied. Data on the target behavior—aggressive actions such as pinching and hitting peers—was collected until a stable pattern was observed over six consecutive sessions. Each observation session lasted for one instructional period (lesson hour).

#### **2. Implementation of the Intervention (Condition B1):**

The intervention was conducted in a single-classroom setting equipped with a designated observation-based time-out area. A child was placed in the time-out room if they exhibited aggressive behavior (pinching or hitting) ten times consecutively. If the child resisted, the researcher used gentle verbal prompts and guided the child to the time-out area. The duration of the time-out was extended if the child displayed additional aggressive behavior, such as shouting. No verbal feedback regarding the behavior was provided during the time-out period, in accordance with Cooper's (1987) recommendation that time-out durations should range between 5 to 10 minutes.

Behavioral data were recorded in 5-minute intervals during each session. Initially, when aggressive behavior occurred, the child was placed in time-out for 5 minutes. If the child exhibited appropriate behavior for the subsequent 5 minutes (e.g., refrained from hitting or pinching peers), they were allowed to

return to their seat and resume classroom activities. Continued appropriate behavior during the next 5-minute interval was reinforced with verbal praise (e.g., "Good job" or "Great, you didn't pinch").

At the beginning of the intervention, rewards were delivered more frequently—approximately every 5 minutes of appropriate behavior. As the target behavior decreased, the interval between rewards was gradually increased. Tangible reinforcements, such as a small toy robot, were introduced after the child maintained appropriate behavior for 15 minutes, then increased progressively to 30 minutes, and eventually provided at the end of the session.

#### **3. Return to Baseline (Condition A2):**

After data from the intervention condition (B1) demonstrated stability in both level and trend, the procedure returned to a second baseline phase without intervention.

#### **4. Reintroduction of the Intervention (Condition B2):**

Following the second baseline, the intervention phase was reintroduced to assess the consistency of behavioral change.

#### **5. Data Analysis:**

Aggressive behavior data across all four phases (A1-B1-A2-B2) were plotted on an A-B-A-B design graph. Changes in the target behavior were analyzed by comparing trends and levels across baseline and intervention conditions.

Data collection techniques in this study included interviews, observations, and document analysis. These methods were employed to examine aggressive behavior exhibited by the subjects during both baseline and intervention phases. The data analysis was conducted using an A-B-A-B research design graph, following the approach outlined by Tawney and Gast (1984) and Richard et al. (1999). Two graphical analyses were performed: the first compared baseline and initial intervention conditions (A1 and B1), and the second

compared baseline and the second intervention phase (A1 and B2).

In the analysis of the graph, several variables were considered, including changes in behavior levels, trend stability, and the presence of overlapping data points between phases. These indicators were interpreted to evaluate the effectiveness of the reward and punishment system, particularly when applied using an interval reinforcement schedule, in reducing aggressive behavior among early childhood learners.

The research subjects were two children aged 5 and 6 years, and the study was conducted at Xaverius Kindergarten in Kairagi.

## RESULT

### 1. Results of the First Baseline Condition (A1)

During the initial baseline condition (A1), no intervention was applied. The average

frequency of aggressive behaviors—specifically pinching and hitting peers—was recorded at 28.5 instances for subject AM and 26.3 instances for subject BR per session. In this phase, when a child engaged in aggressive behavior, the teacher responded by relocating the child to a different seat without providing verbal feedback. If the aggressive behavior persisted, a brief time-out lasting between 3 to 5 minutes was implemented. Children who demonstrated appropriate behavior during the time-out were allowed to return to their seats, accompanied by a verbal reminder.

Behavioral data were collected at five-minute intervals throughout a single instructional period (lesson hour). The detailed frequency of aggressive behaviors observed during the first baseline condition (A1) is presented in Table 1 below.

**Table 1 Aggressive Frequency During Baseline Conditions (A1)**

Subject	Session/Day	Pinching	Hitting	Total
AM	1	13	21	34
	2	9	13	22
	3	14	18	32
	4	11	17	28
	5	10	17	27
	6	11	17	28
Total		68	103	171
Mean level		68/6=11,3	103/6= 17.2	28,5
Subject	Session/Day	Pinching	Hitting	Total
BR	1	12	19	31
	2	8	13	21
	3	13	18	31
	4	9	12	21
	5	14	16	30
	6	10	14	24
Total		66	92	158
Mean level		11	15.3	26.3

As presented in Table 1, the frequency of pinching and hitting behaviors exhibited by child AM showed considerable fluctuation during the first three sessions (34, 22, and 32 instances, respectively). However, in the subsequent four sessions, the behavior stabilized with frequencies of 28, 27, and 28 instances. Similarly, child BR demonstrated notable fluctuations in the first three

sessions (31, 21, and 31 instances), followed by a more stable pattern in the final three sessions (21, 30, and 24 instances).

According to Tawney and Gast (1984), a minimum of three consecutive sessions with stable data is required to proceed with the next phase in a single-subject A-B-A-B design. Based on this criterion, the stability observed in both subjects' behaviors during

the latter sessions of the baseline condition (A1) provided the necessary assurance for the researcher to proceed to the first intervention phase (B1), as the data no longer displayed significant variability.

## 2. First Intervention Conditions (B1)

During this phase, the independent variable—namely, the implementation of rewards and punishments—was introduced. The intervention procedure involved placing the child in a designated time-out area for 3 to 5 minutes upon the occurrence of aggressive behavior (pinching or hitting). If the child demonstrated appropriate behavior during the time-out period, they were permitted to return to their seat. Should the child refrain from engaging in aggressive behavior for a consecutive 5-minute period, they received both verbal praise and material reinforcement (e.g., a small toy or token).

As the intervention progressed, the reinforcement schedule was gradually thinned by increasing the interval between rewards to 10–15 minutes. This adjustment aimed to reduce the child’s dependency on external reinforcement while maintaining positive behavioral change.

The combination of reward and punishment techniques was observed to have a significant impact on reducing aggressive behavior. As shown in Table 2, the frequency of pinching and hitting behaviors in child AM began to decline from the eighth session onward. By the final sessions, instances of hitting had reduced to approximately four per session, and pinching behavior had been eliminated entirely.

Similarly, for child BR, a notable decrease in aggressive behavior began in the twelfth session. From that point forward, the frequency of hitting decreased to around four instances per session, and pinching behavior was no longer observed in the final session.

Overall, both subjects exhibited a 90% reduction in aggressive behavior, surpassing the predetermined threshold of 80% set in the research hypothesis. Consequently, the study was continued into the second baseline condition (A2). Detailed changes in the target behaviors observed during the first intervention condition (B1) are presented in Table 3.

**Table 2 Frequency of Aggressive Behavior During the First Intervention Condition (B1)**

Subject	Session/Day	Pinching	Hitting	Total
AM	7	9	11	20
	8	9	12	21
	9	9	12	21
	10	7	11	18
	11	5	9	14
	12	5	8	13
	13	5	9	14
	14	4	7	11
	15	3	7	10
	16	2	8	10
	17	1	7	8
	18	2	5	7
	19	1	5	6
	20	2	6	8
	21	1	4	5
	22	0	4	4
	23	0	4	4
	24	0	4	4
Total		65	133	198
Mean level		65/18=3,6	133/18=7,4	199/18=11
Subject	Session/Day	Pinching	Hitting	Total
BR	7	8	13	21
	8	8	12	20

	9	9	13	22
	10	8	10	18
	11	7	8	15
	12	6	9	15
	13	4	9	13
	14	3	7	10
	15	5	7	12
	16	3	8	11
	17	1	9	10
	18	1	6	7
	19	1	5	6
	20	2	4	6
	21	1	3	4
	22	0	4	4
	23	0	4	4
	24	0	4	4
Total		67	135	202
Mean level		67/18=3,7	135/18=7,5	202/18=11,2

### 3. Second Baseline Condition (A2)

The second baseline phase (A2) replicated the conditions of the initial baseline (A1), during which no intervention was applied. This phase aimed to assess whether the effects of the previously implemented reward and punishment intervention were sustained in the absence of reinforcement. For child AM, although a reduction in aggressive behavior was initially observed, the frequency of pinching and hitting began to increase again starting from session 6 through the final session of the A2 phase.

Similarly, for child BR, aggressive behavior showed an initial decline but began to rise again from session 4 onward, as illustrated in Table 3.

These findings indicate that the behavioral improvements observed during the first intervention phase (B1) were not fully maintained once the intervention was withdrawn. Consequently, a second intervention phase (B2) was deemed necessary to reinforce the desired behavioral changes and prevent the recurrence of aggressive behaviors

**Table 3 Aggressive Frequency During the Second Baseline Condition (A2)**

Subject	Session/Day	Pinching	Hitting	Total	
AM	25	1	3	4	
	26	1	3	4	
	27	1	3	4	
	28	1	3	4	
	29	0	4	4	
	30	1	4	5	
	31	1	6	7	
	32	1	5	6	
	33	1	5	6	
	34	1	5	6	
	Total		9	41	50
	Mean level		9/10=0,9	41/10=4,1	50/10=5
	Subject	Session/Day	Pinching	Hitting	Total
BR	25	1	2	3	
	26	1	2	3	
	27	1	2	3	
	28	1	3	4	
	29	1	3	4	
	30	0	3	3	
	31	1	4	5	

	32	1	5	6
	33	1	5	6
	34	1	4	5
Total		9	33	42
Mean level		9/10=0,9	33/10=3.3	42/10=4.2

#### 4. Second Intervention Condition (B2)

In the second intervention phase (B2), the reward and punishment strategy was reintroduced to evaluate its continued effectiveness in reducing aggressive behavior. As shown in Table 4, the aggressive behavior exhibited by child AM remained unstable throughout the sessions, indicating some inconsistency in response to the intervention.

In contrast, child BR showed a marked decrease in aggressive behavior, which stabilized across approximately seven consecutive sessions. This suggests a more

sustained behavioral improvement in response to the reimplementation of the intervention.

Overall, the second intervention phase confirmed the effectiveness of the reward and punishment strategy in reducing aggressive behavior in both subjects. While child BR demonstrated a more consistent pattern of improvement, the intervention continued to have a positive influence on both children, reinforcing the potential utility of this behavioral approach in early childhood educational settings.

**Table 4 Frequency of Aggressive Behavior During the Second Intervention Condition (B2)**

Subject	Session/Day	Pinching	Hitting	Total
AM	35	1	3	4
	36	1	2	3
	37	0	3	3
	38	1	3	4
	39	0	3	3
	40	0	3	3
	41	0	4	4
	42	0	3	3
	43	0	4	4
Total		3	28	31
Mean level		3/9=0,3	29/9=3,1	31/9=3.4
Subject	Session/Day	Pinching	Hitting	Total
BR	35	0	3	3
	36	1	3	4
	37	0	3	3
	38	0	3	3
	39	1	2	3
	40	0	3	3
	41	0	3	3
	42	0	3	3
	43	0	3	3
Total		2	26	28
Mean level		2/9=0,2	26/9=2,9	28/9=3.1

#### 6. Visual Analysis

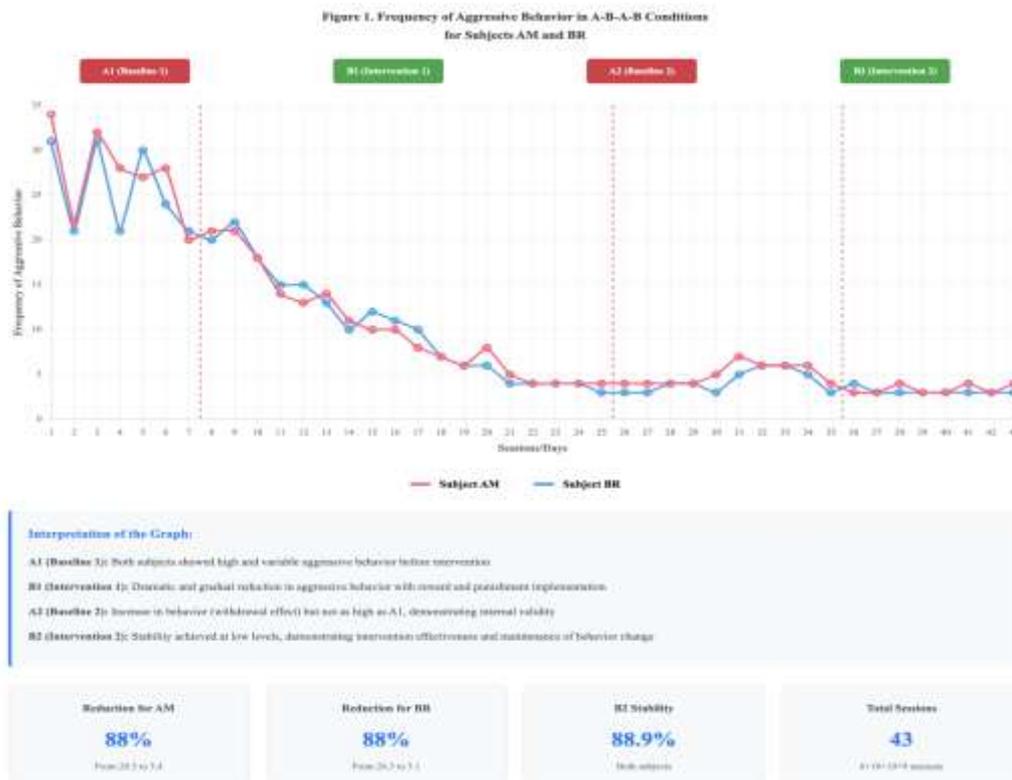
The data in table 5 is a summary of data on baseline condition A1, intervention

condition B1, baseline condition A2 and intervention condition B2 which can be seen in table 5 below.

**Table 5 Frequency of Aggressive Behavior in the A-B-A-B Condition for both subjects**

Session/Day	A1		Session/Day	B1		Session/Day	A2		Session/Day	B2	
	Subject			Subject			Subject			Subject	
	A M	B R									
1	34	31	7	20	21	25	4	3	35	4	3
2	22	21	8	21	20	26	4	3	36	3	4
3	32	31	9	21	22	27	4	3	37	3	3
4	28	21	10	18	18	28	4	4	38	4	3
5	27	30	11	14	15	29	4	4	39	3	3
6	28	24	12	13	15	30	5	3	40	3	3
			13	14	13	31	7	5	41	4	3
			14	11	10	32	6	6	42	3	3
			15	10	12	33	6	6	43	4	3
			16	10	11	34	6	5			
			17	8	10						
			18	7	7						
			19	6	6						
			20	8	6						
			21	5	4						
			22	4	4						
			23	4	4						
			24	4	4						
6 sessions	17	15	18 sessions	19	20	10 sessions	40	42	9 sessions	31	28

Data at baseline and intervention conditions are plotted on an A-B-A-B graph. Visual analysis of the graph includes changes in levels (levels and stability of trends).



Visual chart analysis includes changes in levels and trend stability, which can be seen in table 6 below.

**Table 6. Calculation of the stability of aggressive behavior trends from the A-B-A-B graph using the split middle method**

Steps	Subject	A1	B1	A2	B2
Determining the trend line limits	AM	$34 \times 0,15 = 5,1$	$21 \times 0,15 = 3,15$	$7 \times 0,15 = 1,05$	$3.4 \times 0,15 = 0.51$
	BR	$31 \times 0,15 = 4,65$	$22 \times 0,15 = 3,3$	$6 \times 0,15 = 0,9$	$3.1 \times 0,15 = 0.47$
Mean Level	AM	$171 : 6 = 28,5$	$198 : 18 = 11$	$40 : 10 = 4$	$31 : 9 = 3.4$
	BR	$158 : 6 = 26.3$	$202 : 18 = 11,2$	$42 : 10 = 4,2$	$28 : 9 = 3.1$
Upper limit of the trend line	AM	$28,1 + 5,1 = 33,3$	$11 + 3,15 = 14,15$	$4 + 1,05 = 5,05$	$3.4 + 0.51 = 3.91$
	BR	$26.3 + 4.65 = 30.95$	$11,2 + 3,3 = 14,5$	$4,2 + 0,9 = 5,1$	$3.1 + 0.47 = 3.57$
Lower limit of the trend line	AM	$28,1 - 5,1 = 23$	$11 - 3,15 = 7,85$	$4 - 1,05 = 2,95$	$3.4 - 0.51 = 2.89$
	BR	$26.3 - 4.65 = 21.65$	$11,2 - 3,3 = 7,9$	$4,2 - 0,9 = 3,3$	$3.1 - 0.47 = 2.63$
Trend stability	AM	4:6=66.6% (Variabel)	8:18=44.4% (Variabel)	6:10=60% (variabel)	8:9=88.9% (STABIL)
	BR	4:6=66.7% (VARIABEL)	6.:18=27.8% (Variabel)	4:10=40% (variabel)	8:9=88.9% (STABLE)

The analysis of trend stability in this study follows the method proposed by Sunanto and Nakata (2005), with reference to stability criteria outlined by Tawney and Gast (1984) and Richard et al. (1999). The procedures are as follows:

- **Trendline Limit** is calculated by multiplying the highest frequency value of the target behavior within a condition by a fixed criterion value (e.g.,  $34 \times 0.15 = 5.1$ ).
- **Mean Level** is obtained by dividing the total frequency of the target behavior in one condition by the number of sessions within that condition.
- **Upper Limit** is determined by adding the trendline limit to the mean level.
- **Lower Limit** is determined by subtracting the trendline limit from the mean level.

- **Trend Stability** is assessed by calculating the number of data points that fall within the upper and lower trendline limits.

According to the stability criterion, if less than 80% of the data points fall within the trendline limits, the data pattern is classified as *variable*. Conversely, if 80% or more of the data points fall within the limits, the trend is considered *stable* or *consistent* (Tawney & Gast, 1984; Richard et al., 1999).

The results of the analysis within each condition can be seen in Table 7, which summarizes the results of the analysis within each condition. This data is taken from Table 7, which can be seen below.

**Table 7. Within Conditions Analysis Results**

Condition	A1		B1		A2		B2	
Subject	AM	BR	AM	BR	AM	BR	AM	BR
Condition Width	6	6	18	18	10	10	9	9
Trend direction estimation	Down (-)	Down (-)	Down (+)	Down (+)	Up (-)	Up (-)	Up (+)	Flat (=)
Trend stability	Variable	Variable	Variable	Variable	Variable	Variabel	Stable	Stable
Data paths within trend	(-)(=)	(-)(=)	(+)(=)	(+)(=)	(=)(-)	(=)(-)	(=)	(=)
Level and range stability	Variable (22-34)	Variable (21-31)	Variable (4-21)	Variable (4-22)	Variable (4-7)	Variable (3-6)	Stable (3-4)	Stable (3-4)
Level changes	(34-28) (+6)	(31-24) (+7)	(20-4) (+16)	(21-4) (+17)	(4-6) (-2)	(3-5) (-2)	(4-4) (0)	(3-3) (0)

The results of the analysis between adjacent conditions can be seen in table 8, which is a summary of the results of the comparative

analysis of conditions (between adjacent conditions), which can be seen below.

**Tabel 8. Analysis Result between adjacent conditions**

Comparison	B1/A1 (Subject AM)	A2/B1 (Subject AM)	B2/A2 (Subject AM)	B1/A1 (Subject BR)	A2/B1 (Subjek BR)	B2/A2 (Subject BR)
Number of variables that change	1	1	1	1	1	1
Changes in trend stability and effects	Variable to Variable Down (+)	Variable to Variable Up (-)	Variable to Stable Down (+)	Variable to Variable Down (+)	Variable to Variable Up (-)	Variable to Stable Down (+)
Effect	Positive	Negative	Positive	Positive	Negative	Positive
Change in trend stability	Variable to Variable	Variable to Variable	Variable to Stable	Variable to Variable	Variable to Variable	Variable to Stable
Level Change	(28-20) (+8)	(6-4) (-2)	(5-4) (+1)	(26-21) (+5)	(5-4) (-1)	(4-3) (+1)
Overlap percentage	1/18=5.6%	9/10=90%	6/9=66.7%	0/18=0%	10/10=100%	7/9=77.8%

**Overlapping data** is calculated by determining the number of identical data points between the baseline condition (A1) and the first intervention condition (B1), divided by the number of sessions in the B1 condition, then multiplied by 100%. The stability criterion for trend direction used in this study is 15%. According to Tawney and Gast (1984) and Ricard et al. (1999), if the percentage of overlapping data is equal to or greater than 80%, the trend is considered *stable*. Conversely, if the overlap is less than 80%, the trend is classified as *variable*. The analysis includes two components:

- **Within-condition analysis**, which examines the direction of the trend and the stability of the behavior levels during each phase.
- **Between-condition analysis**, which focuses on changes in trend direction and level across adjacent phases, as well as the percentage of overlapping data between those phases.

Together, these analyses are used to evaluate the effectiveness of the reward and punishment intervention in reducing aggressive behavior in early childhood. The results of this graphical analysis are presented in Tables 6, 7, and 8.

## DISCUSSION

### 1. The discussion addresses three aspects:

(1) interpretation of the A-B-A-B graph analysis results, (2) reduction in punishment, and (3) reduction in aggressive behavior. Interpretasi hasil Analisa grafik A-B-A-B

Interpretation of the A-B-A-B Graph Analysis Results

The implementation of the reward and punishment intervention demonstrated a positive impact on the frequency of aggressive behavior. For child AM, this effect became apparent after the target behavior stabilized in the last three sessions of the baseline phase (A1), continuing into the first intervention phase (B1). Similarly, for child BR, stabilization occurred over the final four sessions of A1, followed by improvements in B1.

The positive outcomes were supported by the following indicators:

- For child AM, a change in level between A1 and B1 conditions was observed (+6), indicating a meaningful reduction in aggressive behavior. Additionally, the percentage of overlapping data between A1 and B1 decreased from 5.6% to 0% in the final three sessions, and the trend direction shifted immediately upon entering the B1 phase, stabilizing in the final three sessions.

- For child BR, a similar pattern was observed. There was 0% overlap in the final four sessions of B1, and the trend direction changed promptly following the transition into the B1 condition, with stability observed over four sessions.

In the transition from A2 to B2:

- Child AM displayed a delayed response to the second intervention (B2). The first four sessions of B2 mirrored the behavioral frequency observed in B1. However, following the withdrawal of the intervention in A2, the behavior stabilized during the final three sessions of B2. The reward and punishment strategy led to a reduction in aggressive behavior by a level of +8, with the average frequency dropping to four incidents per session in B2. The overlap of 66.7% between A2 and B2 was attributed to the already low frequency of behavior during the early sessions of B2.
- Child BR also exhibited a delayed effect following reintroduction of the intervention. The first three sessions of B2 showed behavioral frequencies similar to B1. After the discontinuation of intervention in A2, aggressive behavior stabilized over the last five sessions of B2. The intervention resulted in a level change of +5, reducing the average frequency of aggressive incidents to three per session. The overlap of 77.8% between conditions was due to low behavioral frequency in the first three sessions of B2.

These findings suggest that the observed improvements were associated with (1) a reduction in the frequency of applied punishment, and (2) a decrease in the frequency of aggressive behaviors such as pinching and hitting. The explanation is as follows:

## 2. Decrease in the Use of Punishment

The data further demonstrate a reduction in the use of punishment over the course of the

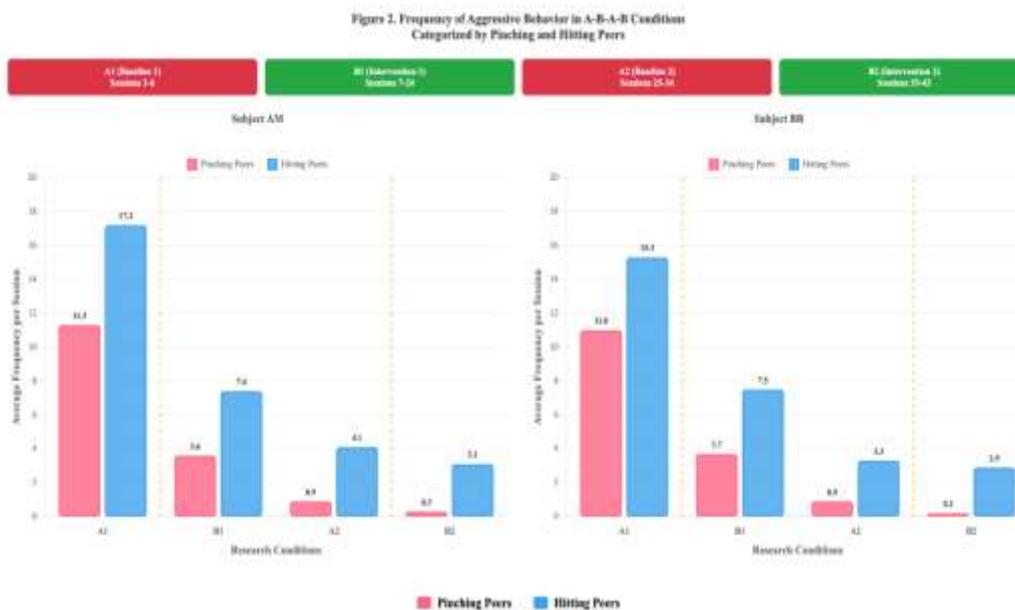
intervention. Although punishment continued to be applied when necessary, its frequency declined significantly as the intervention progressed. In contrast, reinforcement remained consistently in use, although its delivery rate was gradually reduced. Initially, reinforcement—both verbal praise and tangible rewards (e.g., toy robots)—was provided at 5-minute intervals. As the children's behavior improved, the interval was extended to 10–15 minutes, and eventually reinforcement was only given at the end of the session. This reduction aimed to prevent dependence on external reinforcement while maintaining behavioral gains.

## 3. Decrease in the Frequency of Aggressive Behavior

The implementation of the reward and punishment intervention led to a marked decrease in the frequency of aggressive behavior in both participants.

- For **child AM**, the average number of aggressive behaviors recorded during the initial baseline condition (A1) was 28.5 instances per session. This decreased to an average of 11 instances during the first intervention phase (B1). In the second baseline condition (A2), the average dropped further to 5, and was reduced again to 3.4 during the second intervention phase (B2).
- For **child BR**, the average frequency of aggressive behavior was 26.3 instances per session during A1, decreasing to 11.2 in B1. In the A2 phase, the average fell to 4.2, and further decreased to 3.1 during B2.

These findings indicate that the use of rewards and punishments, when implemented with consistency and appropriate timing, was effective in reducing aggressive behaviors such as pinching and hitting in early childhood. A visual representation of the decline in aggressive behavior across conditions is presented in Figure 2 below.



**Graphical Analysis of Aggressive Behaviors: Pinching and Hitting**

The graphical representation of aggressive behavior was divided into two specific categories: (1) pinching a peer and (2) hitting a peer during classroom activities, across both baseline and intervention conditions. In the final five sessions of the second intervention phase (B2) for child AM, and in the final four sessions of B2 for child BR, the frequency of pinching behavior reached zero. This indicates the complete elimination of this particular form of aggression by the end of the intervention for both subjects.

However, hitting behavior persisted at a low frequency. In the final session of condition B2, child AM exhibited four instances of hitting, while child BR exhibited three. These data suggest that while the intervention was highly effective in reducing both types of aggressive behavior, hitting was more resistant to complete elimination compared to pinching.

The number of sessions in intervention condition B1 totaled 18, while condition B2 consisted of 9 sessions. This indicates that the reduction in aggressive behavior did not occur immediately, but followed a gradual downward trend. Specifically, the average number of aggressive incidents decreased from 28.5 for child AM and 26.3 for child BR during the initial baseline phase (A1), to

only 3 incidents by the end of B2. This represents a substantial reduction, although aggressive behavior was not entirely eliminated—approximately 10% (3 instances) remained in the final condition.

This residual behavior may be attributed to external variables not examined in the present study. For instance, environmental influences at home, or the absence of other reinforcement strategies that were not incorporated into the intervention plan, may have contributed to the persistence of some aggressive behaviors. During classroom activities such as studying or playing, both children occasionally continued to exhibit mild forms of aggression, such as pinching peers to take toys or stationery—though the frequency and intensity were significantly reduced compared to the pre-intervention phase.

Importantly, the overall effectiveness of the intervention was clearly observable. Teachers noted meaningful behavioral improvements, particularly in the classroom environment. Post-intervention, teaching and learning activities were reported to proceed more smoothly and without significant disruptions from the previously aggressive children. These qualitative observations further support the quantitative data, demonstrating the practical benefits of

using rewards and punishments as a behavior management strategy in early childhood education.

Furthermore, based on parental reports, the child's behavior at home showed noticeable improvement compared to the period prior to the study. Additional follow-up information obtained from the child's elementary school teacher during the first month of first grade revealed that no significant aggressive behaviors were observed. This suggests that the application of the reward and punishment intervention had a meaningful and lasting impact.

The findings demonstrate evidence of both behavior maintenance and generalization. Maintenance was observed in the form of sustained reductions in aggressive behavior, even after the intervention had concluded. Generalization occurred when the improved behavior extended to different environments—specifically, in a new classroom setting and under the supervision of a different teacher. These outcomes indicate that the intervention not only reduced aggressive behavior in the short term but also contributed to the development of more adaptive behavior patterns across contexts and over time.

### **HYPOTHESIS TESTING**

The implementation of the reward and punishment intervention effectively reduced aggressive behavior in both subjects. For child AM, the average frequency of aggressive behavior decreased from 28.5 incidents in the initial baseline condition to 4 incidents during the intervention phase, and further decreased to 3.4 incidents in the final condition—representing an overall reduction of approximately 88%. Similarly, for child BR, the average frequency decreased from 26.3 incidents in the initial condition to 3.1 incidents in the final condition, also reflecting a reduction of approximately 88%.

The stability rate of behavioral change for both subjects was recorded at 88.9%, exceeding the minimum threshold for stability and consistency of behavioral

improvement. Based on these findings, the research hypothesis—which posited that the application of rewards and punishments would lead to at least an 80% reduction in aggressive behavior—can be accepted. The results clearly demonstrate the effectiveness of this behavioral intervention in significantly reducing aggression in early childhood settings.

## **CONCLUSION AND SUGGESTION**

### **CONCLUSION**

Based on the research findings and discussion presented above, the following conclusions can be drawn:

1. The application of reward and punishment interventions is effective in reducing aggressive behavior in early childhood. This is evidenced by positive changes in behavioral trends and an improvement in trend stability—from variable to stable patterns—throughout the intervention phases.
2. The intervention also demonstrated effectiveness in the maintenance and generalization of non-aggressive behavior. Even after the conclusion of the research, the children continued to exhibit appropriate behavior upon transitioning to elementary school, despite being in a new learning environment and under the guidance of different teachers. This indicates that the behavioral improvements achieved during the intervention were sustained and transferable across contexts.

### **SUGGESTION**

Based on the conclusions of this study, the following suggestions are proposed:

1. **For Kindergarten institutions:** Aggressive behavior in early childhood can be effectively addressed through collaborative efforts involving parents, classroom teachers, co-teachers, and school principals. A coordinated approach is essential in creating a consistent and supportive environment for behavioral change.

2. **For Kindergarten teachers:** It is recommended that teachers implement reward and punishment strategies—as demonstrated in this study—as a behavioral intervention to reduce aggressive behavior in early childhood. This method has proven effective in managing aggression among young learners.
3. **For future researchers:** Further studies may be conducted on other children exhibiting aggressive behavior in Kindergarten settings to expand the understanding of intervention outcomes across diverse individuals.
4. **For researchers in general:** It is recommended that this study be replicated with other children who display aggressive behavior, particularly among Kindergarten-aged children (ages 3–4) in North Sulawesi. Replication would help establish the generalizability of using rewards and punishments as a viable method for reducing aggressive behavior in early childhood education contexts.

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