Research Article

Token Economy to Reduce Aggressive Behavior in Adolescent with Intellectual Disabilities

May Lia Elfina

Psychology Department, University of Muhammadiyah Malang, Indonesia

Abstract.

Aggressive behavior is often found in individuals with intellectual disabilities (ID). Aggressive behavior arises due to low cognitive capacity so that the ability of individuals with ID to understand situations or the environment has limitations on the other side. The process of understanding the situation and realizing how to respond is very important so that individuals can adapt well to the environment. On the other hand, realizing adaptive behavior in individuals with ID is quite difficult. This research attempts to give an overview of the token economy to reduce aggressive behavior in hitting, shouting, and countering. This study aims to look at the effectiveness of token economy in reducing aggressive behavior in adolescents with ID. The research method used was single case experimental design. Data were obtained through observation, interviews, and psychological tests. Pretest and posttest were carried out on aggressive behavior before and after the treatment. The results of the token economy treatment showed a decrease in aggressive behavior on the subject as a whole (calculated based on a behavioral checklist), both in hitting (formerly 6 to 0), shouting (formerly 9 to 0,2), and countering behavior (formerly 6 to 0.2). There was a decrease from 24 to 3 based on the CBLC score after the treatment. Thus, it can be concluded that the token economy has proven effective in reducing aggressive behavior in adolescent with intellectual disabilities.

Keywords: aggression, intellectual disability, token economy

Corresponding Author: May Lia Elfina; email: mayliaelfina@umm.ac.id

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1. BACKGROUNDS

Intellectual Disability is found in about two out of every hundred people. In many parts of the world, this condition is also known as mental retardation. The term Intellectual Disability/ID is considered a condition of abnormal intelligence development, especially characterized by a decrease in skills, overall level of intelligence and lasts for a period of development [1]. The American Association of Intellectual Disabilities Development (AAIDD) describes ID as a significant limitation in both intellectual functioning and adaptive behavior including conceptual, social, and practical skills [2].

Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM V) proposes to change the name of this group of disorders which was originally called Mental

Retardation became Intellectual Disabilities. According to DSM V [3] Intellectual Disabilities can be enforced if three criteria are met, namely experiencing a decrease in general mental abilities including academics, problem solving, reasoning, judgment, with evidence of an IQ score below 70, experiencing a decrease in adaptive function, which limits individual involvement in social environment, for example communication, performance at school or work, and self-reliance in the family environment and in society in general, as well as the onset of impairments and adaptive function deficits continue throughout a person's development.

ID classification is the basis for treatment or intervention criteria, where the more severe the level of ID, the simpler the intervention given. The development of ID abilities and skills when given intervention also differs from each level of severity. ID classification is based on the IQ that an individual has. Profounds are individuals with an IQ of less than 20, their abilities are classified as lacking self-care and language skills are also minimal. Severe (IQ 20-35), developmental abilities are often hampered, it is difficult to express words, but is still able to carry out self-help activities with the help of others. Moderate (IQ 35-50), the ability to think logically is indeed hampered, but is quite capable of carrying out daily communication. Mild (50-70), development is slower than people in general, but is able to communicate quite well, and can be trained, given learning (educable), but all of them need continuous guidance [2,4].

Problems that are often experienced by individuals with ID include disruptive behavior (eg rude, swearing, lying, stubborn and disobedient), communication (eg talking to oneself or imaginary people), anxiety (eg sad because alone, fear of certain things or situations, being upset or sad over small changes), social relationships (e.g. not showing affection, withdrawing into himself/her own world, refusing to be hugged or touched), depression (e.g. unhappy, confused, deprived of pleasure) to behavior that violates social rules and norms [5].

Factors that can cause individuals to experience ID are divided into 2 [6]. The first cause is a biological cause, namely a genetic disorder of infection and intoxication, trauma during prenatal, perinatal, or postnatal. The second cause is psychosocial, namely the lack of stimulation of learning and communication skills, which is most common in families with a lower economy.

Limitations in processing information are often the reason that individuals with ID are too quick to conclude information, so that the resulting perceptions can be wrong perceptions, and trigger emotions in themselves resulting in aggressive behavior. Aggression occurs in almost 30% of a total of 551 individuals with intellectual disability and a mechanism is needed to solve this problem by processing angry behavior in individuals

with ID [7]. Aggression is behavior that refers to something that violates socially unacceptable norms or behavior. Aggression can be physical and verbal. Some forms of aggression include physical aggression [hitting, kicking, stabbing, etc.]; verbal aggression includes swearing, shouting, countering; anger which is a feeling and has no purpose whatsoever; hatred [a negative attitude towards others] [8]. Factors that influence aggressiveness are exposure of violence, inconsistent/very permissive or very harsh parental discipline, and disturbance from people around the individual [9].

Age is greatly influencing the dynamics of problems, especially individuals with intellectual disabilities. Individuals entering their teens are one of the risk factors for maladaptive behavior. According to Erik H. Erikson's theory of development, namely Psychosocial Theory, that when a child enters adolescence is the period when the individual is looking for his identity. This stage of psychosocial development in adolescence 12-18 years is also called identity vs role confusion, where adolescents will identify based on ego identity, one of which is elevating themselves by using an ideal social status according to the child's ego at that age [10[10]. Thus, the individual is still very egocentric, and has unstable emotions. Adolescents with ID do not have the same capacity for feeling and emotional needs as normal people in general, therefore they often experience distress which results in aggression as a form of behavior [11]. Individuals with ID have difficulty labeling certain specific emotions, but they can understand certain emotions through expression with continuous training [12]. Because of that it is important to intervene so that the subject is able to exercise control over his aggression by providing an alternative understanding of the choices he makes when he is emotional.

The treatment used to reduce aggressive behavior is the token economy. The token economy is giving a chip [or a token, a token] as soon as possible each time each target behavior occurs. These pieces can later be exchanged for objects or strengthening activities that the subject wants [13]. The token economy is behavior modification with techniques based on the principles of operant conditioning with the application of reinforcement in practice [14].

The token economy is implemented without any understanding of the behavior being changed. So, it is quite easy to do in individual with intellectual limitations. The token economy is one of them used for the problem of aggression in children with ID, and it is very necessary for nurses/caregivers to understand when doing therapy [15]. Caregivers were given explanations related to the course of therapy, by means of roleplay and discussion. In addition, the therapist needs to monitor during the course of therapy. The token economy system for individuals with intellectual disabilities was found to be

successful in promoting adaptive behavior [14]. Therefore, researchers conducted this study to determine the effectiveness of interventions against aggressive behavior in subjects. The aggressive behavior that would be treated were snapping, shouting, and countering.

2. RESEARCH METHODS

2.1. Variables or concepts studied

The variables used in this study are the token economy as the independent variable, and aggressive behavior as the dependent variable. The token economy is a type of behavior modification technique which teaches someone about new behaviors or changes current behavior with negative reinforcement or positive reinforcement [16]. The token economy is a procedure used by implementing tokens as a basis for individuals to get boosters in the end [17]. The token economy is considered more effective for reducing destructive behavior than punishment [18]. The token economy is one of the behavioral therapies that can be used to reduce or eliminate deviant behavior [19]. Then, the dependent variable in this study is aggressive behavior. Aggression is behavior that refers to something that violates socially unacceptable norms or behavior. Aggression can be physical and verbal. Some forms of aggression include physical aggression (hitting, kicking, stabbing, etc.); verbal aggression includes swearing, shouting, countering; anger which is a feeling and has no purpose whatsoever; hatred (a negative attitude towards others) [8]. Factors that influence aggressiveness are exposure of violence, inconsistent/very permissive or very harsh parental discipline, and disturbance from people around the individual [9].

2.2. Sampling Method

The sampling method used in this research is purposive sampling. Purposive sampling is a technique for determining subjects with certain considerations or criteria and does not intend to generalize the research results [20]. The criteria used in determining the sample in this study were individuals who was teens (12-18 years), met the criteria for an Intellectual Disability, and showed aggressive behavior (in this study focused on hitting, shouting, and countering behavior) as evidenced by psychological testing tools, namely using the Handtest, CBCL (Child Behavior *Checklist*), and Graphics.

2.3. Research subject

This study uses 1 subject as a participant. The design of this study is anexperimental research which is classified as single case experimental design. The data collection used was by various methods, including observation, interviews, psychological tests, and *self-reports* were also used to find out emotional and behavioral problems in the subject. The researcher made the subject a participant in this study with the approval of the school which initially complained about the subject's aggressive behavior, besides that the consent of the parents had also been obtained by the researcher.

2.4. Research Instruments

The instrument used in this research is CBLC (Child Behavior Check List). CBCL is a measurement tool used to detect behavioral and emotional problems in children and adolescents. CBCL can be filled in by parents, teachers, or those concerned, but in this study the teachers who filled in the measuring instrument were at the subject's school. The reliability of the measuring instrument used is 0.82 [21]. The assessor of this scale decides to choose a score from 0 to 2. 0 means not true (as far as you know), 1 means somewhat or sometimes true and 2 means very true or often true. One example item on this scale is an outburst of anger in subject.

2.5. Research design

The research design uses experimental research with the single case experimental design. Specifically, the design called intervention only design that is useful design to measure baseline formerly then proceed the intervention phase [22]. In the other hand, it can be named by one-shot case study according to Arikunto [23], the researcher only held a one-time treatment which was thought to have had an effect, then a post-test was held. One shot case study is the provision of treatment to the subject and further observation. Treatment is the independent variable, and results are the dependent variable [20]. The terminology of research design is the independent variables referred to the treatment then the dependent variable referred to the measured behavior [24].

2.6. Data Collection Procedures

2.6.1. Subject Assessment Process

Data collection procedures used were observation, interviews, and psychological tests. This method is used to determine the diagnosis of disorders in the subject. Interviews were conducted with the subject, the subject's family and class teacher to obtain in-depth data relating to daily life, and all information about the subject. Observations were also made to determine the subject's appearance, environment, and functioning in his daily life. The psychological tests used include intelligence and personality tests, namely IQ tests (Binet), graphics (BAUM, DAP and HTP), Handtest, and CBCL (Child Behavior Checklist). The Binet test is used to determine the subject's IQ level and mental age. The graphic test is used to determine the subject's personality, attitude tendencies and self-image in a more comprehensive manner, including the subject's tendency to experience ID. Graphic tests are carried out using the DAP (Draw a Person), BAUM (Tree Test), and HTP (House Tree Person) tests. The hand test was conducted to determine the subject's interaction patterns with other individuals and with their environment, including their barriers and readiness to interact. Furthermore, the CBCL (Child Behavior Checklist) scale detects emotional and behavioral problems in children and adolescents, including knowing the subject's level of aggression.

2.6.2. Treatment Process (token economy)

The treatment given in this study is the token economy. Before carrying out the treatment, a baseline was first made as a basis for the frequency of the subject's aggressive behavior. Baseline is used to determine the subject's ability to achieve the desired target of intervention or behavior. In addition, the baseline is used as a comparison of target achievement after the intervention is carried out so that it can describe the effectiveness of the treatment [25]. In this study the baseline was the condition that occurred before the intervention, where the teacher recorded the number of aggressive behaviors that appeared [26].

The target of intervention in this study was to reduce the frequency of the subject's aggressive behavior, where at the *baseline* it was found that the subject's aggressive behavior was in the form of hitting, snapping and countering. The current hitting behavior is 6 times a day, targeted to decrease to 3 times. Meanwhile, for shouting, from 9 times to 4 times, then for challenging, from 6 times to 3 times.

Individuals with ID are easier to misinterpret the social situations they experienced, then because of limitations in communication skills and processing other people's

perspectives, they show direct angry responses [27]. Non-cognitive-based interventions are needed, so that subjects with ID are able to apply these skills in their daily lives.

The following are the stages of Token Economy [14]:

1. Session one: Orientation of therapy implementation and determining baseline

   Creates trust between the subject and the researcher. Introducing contracts and rules in the behavior modification process. In this session, the researcher gave caregivers an understanding of the behavior modification process. Baseline was carried out for five days before carrying out the treatment. At this stage an evaluation is also carried out on the average amount of aggressive behavior every day and a target for reducing aggressive behavior is formulated. The subject's teacher was very open to the discussions that were carried out, and the subject was also very enthusiastic about modifying behavior because he would get *a reward* later. Finally agreed on the target of intervention in this session.

2. Session two: Selecting tokens according to the criteria, as well as how to calculate tokens and reinforements in the form of goods, activities or events that are liked by the subject

   At this stage, subjects, researchers, and teachers agree on the criteria for giving tokens, token calculations, and the type of reinforcement to be given to subjects. Researchers also provide an understanding of the use of *reward boards* for subjects, as well as regulations in implementing treamtemnt. Subjects and teachers understand the treatment plan and *reward design* given during the intervention.

3. Session three: Create procedures for obtaining tokens and reinforcement for subjects

   Researchers and subjects create behavioral targets and provide insights on how to get tokens and reinforcers. Evaluations are given every day, where the subject counts the stars his has earned when the subject is able to divert his aggressive behavior to something more productive, for example doing assignments and talking to other friends. With the *token economy*, the subject diverts aggressive behavior to productive things, for example doing assignments given by the teacher, and participating in other activities such as choosing to go to routine training/vocational classes at school. Subjects agreed on the procedure for getting tokens and were happy to be able to get prizes.

4. Session four: Monitoring interventions

The teacher monitors the subject's behavior and tokenizes immediately when the expected behavior occurs. The teacher also provides reinforcement by giving praise and motivation so that the subject continues to show the expected behavior (holding anger). Evaluation is carried out every week by calculating the stars obtained by the subject. Subjects were enthusiastic and tried not to show aggressive behavior, so that subjects received praise and reinforcement every week (in evaluation/monitoring sessions).

5. Session five: Monitoring interventions

   In this session, researchers, subjects, and teachers evaluate the process of behavior modification and evaluate targets that have not been achieved to be continued to match the targets. The subject was shown *the board reward* he had obtained. The subject is happy because he can reach the target of the intervention. Subjects are also motivated to continue to perform the techniques that have been taught.

6. Session six: Evaluation and termination

   In this session, researchers and subjects evaluate the behavior modification process and provide *rewards* for the subject's success in achieving the treatment target. After conducting the evaluation researcher terminated the behavior modification process and conveyed the existence of a *follow-up session* to the teacher so that the effectiveness of the treatment could be known in reducing the subject's aggressive behavior. However, monitoring continues until the *follow-up process*.

7. Session seven: Follow up

   This session was carried out one week after termination by monitoring aggressive behavior which was targeted to decrease. The target was achieved because the results showed that the subject's aggressive behavior decreased in this session and based on interviews with the subject's teacher, said that the subject was now more active in class and was no longer easily provoked by his emotions and carried out aggression towards his friends. In fact, the subject often reminds other friends not to get angry and fight easily. CBCL was given in this session to the subject teacher to find out the difference in the subject's level of aggression before and after treatment

2.7. Data analysis techniques

The data analysis used in this study is by using descriptive statistical data analysis. Descriptive statistical analysis is the presentation of data through tables, graphs, calculation of averages or percentages, one of which is also by comparing the averages of the results of the study and there is no need to carry out a significance test and there is no level of error because the researcher does not intend to make generalizations so that no there is a generalization error [20].

3. RESULTS

The results showed that the subject experienced a decrease in aggressive behavior in the form of hitting, shouting, and countering. The following is a table of reductions in the subject's aggressive behavior:

Table 1: Reducing Aggressive Behavior Using *Token Economy*.

Forms of Aggressive Behavior	Baseline	Monitoring week 1 [5 days]	Monitoring week 2 [5 days]	Follow Up [5 days]
Hitting	6	0	0	0
Shouting	9	0.4	0.8	0.2
Countering	6	0.8	0.4	0.2

At the beginning of the session, the subjects showed an average of hitting behavior 6 times after the treatment became 0, shouting 9 times, after the treatment became 0.2, and countering 6 times each day, after the treatment became 0.2. The behavior shown by the subject as a substitute for aggressive behavior, namely at the beginning of the session was stimulated by the teacher to do school work, or just talk to other friends. So that when the stimulus that makes the subject angry appears, the subject will carry out other productive activities, this is continuously carried out by the subject so that the subject gets a token from the teacher.

The results of the treatment can be seen more clearly in the graph below. A comparison of the frequency of the subject's aggressive behavior from baseline to follow-up can be seen. The graph is explained based on the frequency of each aggressive behavior, namely hitting, shouting, and countering.

It can be seen from the graph above that there was a decrease in the subject's hitting behavior from baseline to follow-up, where at the baseline the average hitting was at

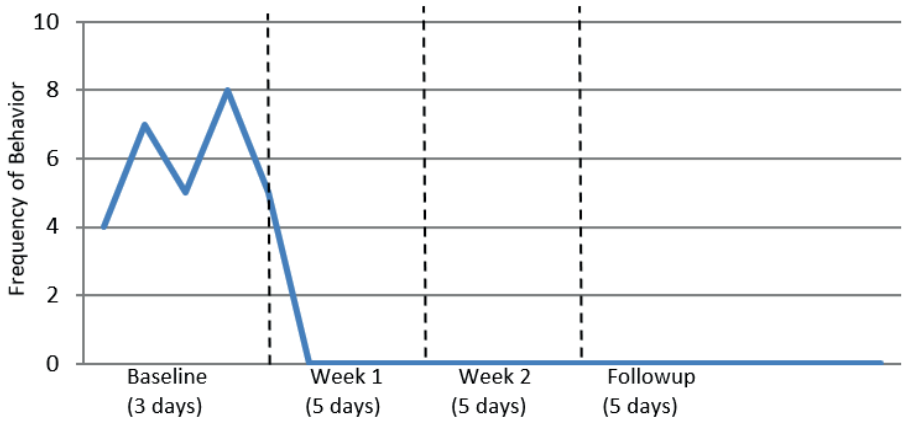

Figure 1: Graph of Reduction in Hitting Behavior.

number 6 then in week 1 monitoring at number 0, then in week 2 monitoring at number 0, and at at follow-up at 0.

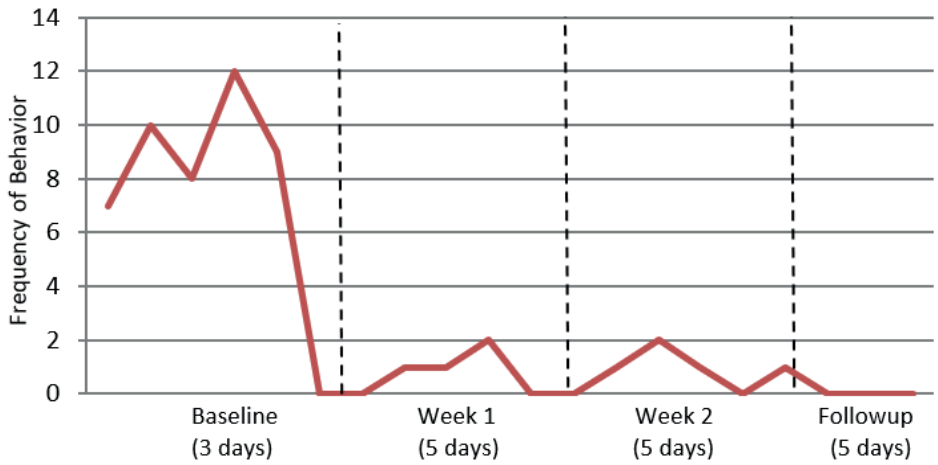

Figure 2: Graph of Reduction in Shouting Behavior.

It can be seen from the graph above that there was a decrease in subject's shouting behavior from baseline to follow-up, where at the baseline the average shouting was at 9 then during week 1 monitoring at 0.4, then at week 2 monitoring at 0.8, and at follow-up at 0.2.

It can be seen from the graph above that there was a decrease in subject's countering behavior from baseline to follow-up, where at baseline the average countering was at number 6 then during week 1 monitoring at number 0.8, then at week 2 monitoring at number 0.4, and at follow-up at 0.2.

Overall, the results of the intervention went well with evidence of a reduction in the subject's aggressive behavior. Where before the treatment was given, when the subject

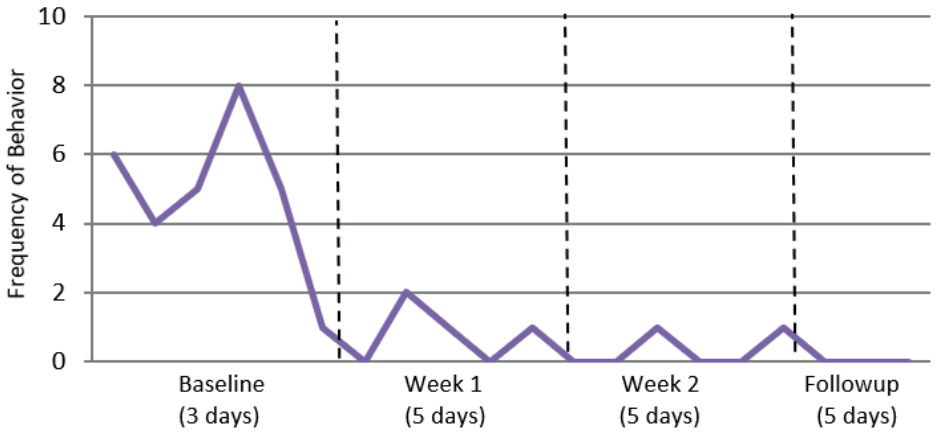

Figure 3: Graph of Decreasing Countering Behavior.

was accidentally nudged by his friend, the subject immediately became angry and challenged his friend. In addition, the replacement behavior performed by the subject when the subject is angry can trigger the subject's activity in class. The teacher said that in the first week the subject was still a little active, but with the subject's habit of holding back his aggressive behavior, the subject became more active in his class.

Follow-up results show that the subject can develop new behaviors, that is, the subject becomes more active in class. The subject also always remembers to be able to restrain his aggressive behavior by doing other activities. The subject was very happy and proud of the reward he got. According to the teacher's observations, the subject also taught his friends about the prohibition to vent anger in class. The CBCL score also showed a decrease, from 24 (before treatment) to 3 (after treatment) on a scale of 36.

4. DISCUSSION

Behavior modification targets are met in each session. This is because the token economy is a behavior modification technique that is easily understood by individuals with ID and has a direct impact on subjects when they succeed in reducing their aggressive behavior. The token economy is a successful intervention to increase adaptive behavior of individuals with ID [14]. The subject tries to change his behavior even without understanding the purpose of changing behavior. The token economy in ID is implemented without any understanding of the behavior to be changed, so this is associated with a companion influence in providing reinforcement rather than providing an understanding of aggression to the subject [15].

The decline that occurred was quite stable, this was also because the subject was always given support and reminded about the need for the subject to struggle in

obtaining tokens so that in the end the subject could get a reward. Therefore, it is very important to educate caregivers in implementing the token economy. Aggressive behavior is strongly influenced by the behavior of the people around it, so it is important when carrying out a token economy that the surrounding environment is conditioned to support individuals in terms of achieving behavioral targets [15].

At the beginning of the subject undergoing the token economy session, the subject's friends tended to support the subject to hold back his anger, but when the subject's friends knew that the subject would get a reward, in the second week, the subject's friends tended to often tease the subject to bring up his aggressive behavior again. However, based on the monitoring and motivation of researchers and teachers, the subject is still trying to restrain his aggressive behavior. Individuals with ID will reduce maladaptive behavior with reinforcement as an alternative diversion accompanied by new skills, for example by reading, writing and arithmetic [14].

In addition to the importance of understanding for caregivers about providing reinforcement, it is also important to create a therapeutic bond between the subject and the researcher where the researcher is a person who tends to be new to the subject, moreover the subject is an individual with ID. Individuals with ID have less experience in dealing with other people, so it is important to create a therapeutic relationship so that trust is established and can respect or respect the therapist [28].

At the beginning of the session, the subject gets 4 stars/token from the therapist, with the aim that the subject becomes more enthusiastic about collecting stars/tokens in the future. At the beginning of the intervention session, the subject received several tokens while being explained about the function of the token he received and the number of tokens expected to be obtained by the subject [17]. Prior to treatment, the subject's aggressive behavior showed an average of hitting 6 times, shouting 9 times, and countering 6 times each day. Each aggressive behavior decreased after monitoring for two weeks. This is because the treatment of the token economy with the principle of cost response is remembered by the subject so that the subject is motivated to collect tokens as a condition for getting a reward in the end.

This reduction in aggressive behavior also has other positive impacts. When the subject does not display aggressive behavior, the subject will carry out other productive activities, including doing assignments from the teacher, talking to other friends, and thus, the subject can become more active in class. Future research is expected to be able to conduct similar research using a better experimental research design with the aim of generalization and is expected to use more accurate data analysis so that the results can be more completed and credible.

5. CONCLUSION

The token economy is proven to reduce aggressive behavior in adolescents with Intellectual Disabilities. Evidenced by a decrease in aggressive behavior from the results of observations that have been made and using the CBCL (Child Behavior Checklist) scale and from the observation results monitoring periodically. The existence of tokens that are collected by the subject and calculated every week makes the subject enthusiastic about getting rewards from the existing tokens. In addition, the subject becomes more enthusiastic when given praise every time a token is given to the subject.

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