Effect of Class-Wide Function-based Intervention Teams (CW-FIT) and the Good Behavior Game (GBG) intervention with Children in a Classroom

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A Thesis

Presented to

the Faculty of the Graduate School

at the University of Missouri- Columbia

In Partial Fulfilment

of the Requirements for the Degree

Master of Science

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by

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May 2019

The undersigned, appointed by the dean of the Graduate School, have examined the thesis entitled

Effect of Class-Wide Function-based Intervention Teams (CW-FIT) and the Good Behavior Game (GBG) intervention with Children in a Classroom

Presented by Dhwani Parikh

a candidate for the degree of Master of Science in Applied Behavior Analysis,

and hereby certify that, in their opinion, it is worthy of acceptance.

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ACKNOWLEDGEMENT

I would like to acknowledge and thank my advisor and committee chair, Dr. SungWoo Kahng, who has supported me, not only during the course of this project, but throughout my entire master's degree. He provided me with a wealth of knowledge and this would not have been possible without his guidance. I would also like to thank Dr. Karen O'Connor. I greatly appreciate how available she was throughout this entire process. I am grateful for your support for encouraging me to be involved in my thesis. I would also like to thank Dr Casey Clay for providing his expertise and serve on my thesis committee. I have enhanced my learning curve from your support and it has helped me grow personally and professionally.

I would like to thank Savannah Tate for providing time, support and feedback throughout the development of this project.

I would also like to thank Kristina Friedrich and Claire Hunt for letting me conduct my project in school. I would like to thank the entire Columbia Public School teachers, students and their parents for volunteering to be a part of this project.

I would like to thank the undergraduate and graduate students for volunteering their time to help in data collection. This would not have been possible without their help and support.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ASD	Autism Spectrum Disorder
CW-FIT	Class Wide Function Based Intervention Teams
GBG	Good Behavior Game
ABA	Applied Behavior Analysis
LD	Learning Disabilities
EBD	Emotional and Behavioral Disorders
n/a	Not applicable
OHI	Other health impairment
ADHD	Attention-deficit/hyperactivity disorder

ABSTRACT

One common issue with children with developmental disabilities is compliance. In Applied Behavior Analysis (ABA) individualized curriculum is developed for each student. However, Maggin et al. (2012) showed that group contingencies are effective in addressing challenging behavior in general education classroom. Research has been done with using two types of interdependent contingency, Class Wide Function Based Intervention Teams (CW-FIT) and Good Behavior Game (GBG). They have each shown their strength in reducing disruptive behavior, but they have not been compared to see which intervention works better when applied alternatively. The purpose of the study is to evaluate the effect of CW-FIT and GBG interventions on disruptive behavior of children in elementary school. The results showed that both the interventions were effective in reducing disruptive behavior. These findings suggested that both interventions work. We did not have a clear finding on praise versus reprimand during baseline, intervention and generalization phase.

Keywords: Class Wide Function Based Intervention Teams, Good Behavior Game, treatment fidelity, generalization, disruptive behavior

Effect of Class-Wide Function-based Intervention Teams (CW-FIT) and the Good Behavior Game (GBG) intervention with Children in a Classroom

A group contingency is one in which a common consequence (e.g., reinforcement) is not just contingent upon the behavior of one person; but rather, it is contingent on the behavior of part of the larger group or the behavior of everyone in the group. There are different types of group contingencies such as dependent, independent, and interdependent (Cooper, Heron, & Heward, 2007). In dependent group contingencies, the consequence for the whole group is dependent on the performance of one single individual or small group. In independent group contingencies, the contingency is present for all the members of the group, but the consequence is only provided to those who meet the criteria. In interdependent group contingencies, all the members of the group must meet criteria to receive the consequence.

Research on group contingencies has shown a strong support for this type of intervention. That is, group contingencies are useful in general educational classrooms to address disruptive behaviors and promote increased academic engagement (Embry, 2002; Litow & Pumroy, 1975; Maggin, Pustejovsky, & Johnson, 2012; Theodore, Bray, & Kehle, 2004; Tingstrom, Sterling- Turner, and Wilczynski, 2006).

Lewis et al. (2002) conducted a study to reduce chronic problem behavior with elementary school aged children during recess. They implemented two components (a) teaching rules (routine and desired behavior) and (b) group contingency. Their results indicated that the frequency of problem behavior reduced across three recess periods.

Lohrmann and Talerica (2004) used a class wide intervention called *Anchor the Boat* with elementary students. Target behaviors were talking out, out of seat and incomplete assignments. Students received a reward if they earned 10 paper clips which were used to

form a chain to connect a boat. The results showed that there was substantial and steady decrease in talking out behavior and results for out of seat and incomplete assignments were inconclusive.

Kelshaw-Levering, Sterling-Turner, Henrey and Skinner (2000) examined the effect of randomizing components to reduce levels of disruptive behavior. They had two phases (RR+) where they randomized reinforcers and (R-ALL phase) where they randomized all components. The results indicated that both the phases were effective in reducing disruptive behavior.

Interdependent group contingency is one in which all members of a group must meet all the criteria of the contingency before any member earns the reinforcer (Elliot, Busses, & Shapiro, 1999; Kelshaw-Levering et al., 2000; Lewis et al.,2002; Skinner et al., 1999; Skinner et al., 2000). Class-Wide Function-related Intervention Teams (CW-FIT) and Good Behavior Game (GBG) are both interdependent group contingencies where each and everyone in the group is responsible for every other member in the group to win the reinforcer. As mentioned before, group contingencies can help to reduce problem behavior and foster positive social interaction within the group. Following is a brief summary of some of the research done on both interventions.

Class-Wide Function-related Intervention Teams (CW-FIT)

Kamps, et al. (2011) demonstrated the effect of Class-Wide Function-related Intervention Teams (CW-FIT) program for students with disruptive behaviors who are at risk for emotional/behavioral disorders (EBD). The components of CW-FIT include (a) clearly defining and teaching desirable communication skills; (b) teaching students to get teacher's attention, following directions, and ignoring inappropriate behavior of fellow classmates; (c) differential reinforcement of alternative behaviors; (d) extinction of problem behavior; (e) reward for desirable behavior (it is same as differential reinforcement of alternative behavior;

DRA; differential reinforcement at individual levels within the context of peer groups with shared group contingencies). Second tier intervention include self-management or peer management and tertiary tier intervention includes help cards, and function-based supports. The findings showed that CW-FIT group contingency intervention increased task engagement increased and decreased disruptive behavior.

Kamps, Wills, and Bannister (2015) used CW-FIT intervention to improve students on-task behavior and to increase teacher recognition of appropriate behavior in an urban and culturally diverse community in elementary school. The on-task behavior increased as compared to comparison group classes. Hirsch et al. (2016) used CW-FIT to increase engagement during physical education class (PE). They targeted small group engagement which included appropriately engaging in an assigned activity, participating in the center activity, making appropriate motor responses, asking for assistance, and waiting appropriately for the teacher to begin or continue with instruction. The results demonstrated that interdependency contingency using first tier CW-FIT can be used to increase the engagement of student in a PE class.

Wills, Kamps, Fleming, and Hansen (2016) used CW-FIT with 17 elementary school children with or at risk for emotional behavior disorders (EBD). The components they focused were on task behavior, disruptive behavior, teacher praise, and teacher reprimand. They also took consumer satisfaction rating from teachers. The results indicated that CW-FIT worked and reduced disruptive behavior.

Weeden et al. (2016) used CW-FIT intervention to improve students on-task behavior in a special education classes with emotional and behavioral disorders (EBD). Their finding showed that on task behavior increased for students, teacher praise increased, and reprimand decreased.

Calderella, Williams, Hansen, and Wills (2015) demonstrated the successful effect of CW-FIT intervention on kindergarten children. Researchers have implemented CW-FIT in French dual immersion classrooms which showed that on task behavior and teachers praise improved and simultaneously teachers reprimand decreased as the intervention was effective. CW-FIT uses differential reinforcement of alternating behavior, which means that the children playing the game would receive a reward for demonstrating other behavior other than the problem behavior. Children need to get more points than the expected criterion. It is based on momentary time sampling in which every sometimes it is checked if they are meeting expectation to give a point. There is another commonly used group intervention is called Good behavior game (GBG) in which children playing the game lose points for not meeting expectations. Following is the research on Good behavior game (GBG).

Good behavior game (GBG)

GBG is an interdependent group contingency where the students lose points for not meeting expectation. It is stringent as children are given points every time they are not meeting expectation. They need to get less points as much as possible to win the reward. Every member in the group is responsible for every other member in the group.

Barrish et al. (1969) conducted GBG on two components, out of seat and talking out. It was conducted for math and reading classes. They applied group contingencies for daily rewards as well as weekly rewards after the team had achieved a weekly mark. The results showed that both behavior decreased after applying the GBG in a classroom.

Donaldson, Fisher, and Kahng, (2017) demonstrated the effect of Good Behavior Game (GBG) at an individual level with kindergarten and first grade students who engaged in disruptive behaviors. Their findings showed that there was less disruptive behavior when GBG was applied overall. It was also helpful in identifying students who would require individualized intervention.

Tanol et al. (2010) demonstrated the effect of GBG by comparing GBG response cost and GBG reinforcement condition the results showed that although both the conditions lead to decrease in rule violation, the reinforcement condition continuously lead to comparable or lower level of rule violation.

Ialongo et al. (2001) reviewed classroom-centered and family-school-partnership intervention and the results indicated that the classroom centered intervention produced lower rate of conduct problems. Kellam et al. (2011) demonstrated the effect of good behavior game they applied the intervention on first and second grade students and they followed up with them at the age of 19-21 years and results showed that they showed they indulged in lower rates of problem behavior. Embry, (2002) implemented good behavior game on fifth grade class to measure talking out, disruptive and out of seat behaviors. The results showed that the game reduced the behavior by over 95% for the behaviors. Good behavior game has been used across different grade level, types of students, settings and long term follow up studies. It is described as best practice to reduce problem behavior.

Relevance to autism

Children with autism spectrum disorder (ASD) show delays in social-communication and joint attention as compared to typically developing children. Group work interventions have been used to improve social communication in children and adolescents with autism (Tommy, Fiona & Aline-Wendy 2007). Group contingency with this population can be very helpful as it can be applied in multiple places, is less time consuming, can help in reducing disruptive behavior quickly, it capitalizes on peer influence or peer monitoring, and helps to integrate positive social interaction within the group (Cooper, Heron, & Heward 2007).

The advantages of group contingencies are that it helps to reduce problem behavior quickly for large number of students which is a feasible intervention for school teachers. So that they can provide attention to each student. It may cultivate social interaction among

group members to win the reward. One disadvantage is that it may create more disruptive behavior if they constantly do not meet criteria and get the reward. It could be demotivating to play the games.

CW-FIT and GBG has been shown to address disruptive behaviors, promote increased academic engagement, and increase on task behavior. Studies have been conducted on elementary school children, disruptive behaviors, children who are at risk for emotional/ behavioral disorders (EBD), increase physical activity in PE class. But there is dearth of studies on children diagnosed with ASD and direct comparison of two intervention (CW-FIT & GBG). As mentioned previously that children diagnosed with ASD exhibit failure to form relations with other people, ritualistic and obsessional behavior which may impair their learning in class. In CW-FIT and GBG both have rewards that can work as motivation to have more attention in class and have less disruptive behavior.

The first purpose is to see the effect of CW-FIT and GBG intervention on disruptive behavior of children in elementary school. A second purpose is that there will be more effect on reducing behavior by CW-FIT than GBG because of the positive reinforcement in CW-FIT and response cost in GBG. The third purpose is that there will be more social interaction among students to ask the fellow member to follow member to follow rules to win.

Methods

Participants and Setting

This study was conducted across three special education classrooms located in three elementary schools in a moderate sized midwestern city. A teacher referred a classroom to participate in this study. Each classroom had one primary teacher leading the classroom with four to six students.

There were three similarly sized classrooms (Classroom A, Classroom B and Classroom C). Classroom A had six students and all the students were diagnosed ASD. Classroom B had five students. Two of those students were diagnosed with ASD, two were diagnosed with emotional behavioral disorder, and one was diagnosed with learning disability (LD). Classroom C had five students, two of whom were diagnosed with ASD, two were diagnosed with (LD), and one had other health impairment (OHI) due to ADHD. See table 6 for participant list.

In Classroom A, the teacher had 31 years of teaching experience in special education class and a master's degree. She did not have prior experience with CW-FIT or GBG. In Classroom B, the teacher had 6 years of teaching experience in special education class and a master's degree. In Classroom C, the teacher had 2 years of teaching experience in special education class and a degree in Elementary Education with a minor in Early Childhood Education. None of the teachers had experience implementing CW-FIT and GBG prior to this study.

Dependent Variables and Response Measurement

Disruptive behavior. Observers scored disruptive behavior using direct observation. The behavior was scored by using partial interval measurement. The participant would circle a + when the disruptive behavior occurred. Disruptive behavior was defined as anytime the student made a noise or spoke to another student that was not in context with the current

work task. There were three other behavior that fell under disruptive behavior. They were, to gain teachers attention, ignore inappropriate behavior and follow directions. There were certain modifications made in each school. See description below in modification area.

To gain teachers attention. The observer would circle + when the student was looking at the teacher and raising hand. Waiting for the teacher to look and give an indication to ask question. The observer would circle – anytime a student would ask a question interrupting other conversation, not raising hand to ask a question, not waiting for the teacher to indicate to go ahead with a question.

Ignore inappropriate behavior. The observer would circle + anytime the student was keeping a pleasant face, looking away from the person making noise, pretending not to listen, keeping a quiet mouth, and following directions to do the work assigned. The observer would circle – anytime the student would comment on the other student's comments, joins other student's conversation or activity like propelling objects by one's hand or leg from its original location, swiping materials, tearing work material, banging on any object with hands, fist or feet using force that is 6 inches of distance. The observer would circle n/a when there is no opportunity for the behavior to occur.

Follow direction. The observer would circle + anytime the student was looking at the teacher and listen, acknowledging it by saying okay and/or showing a thumb up and doing the work or following directions. The observer would circle – anytime the student would not follow direction. Example: eyes at me, everyone has to say, say clearly. After a direction was given students were give 5 seconds to follow directions before it was counted against them. The observer would circle – for following direction anytime the student would not gain teachers attention or ignore inappropriate behavior at the same time circle a + for disruptive behavior.

Off task behavior. The observer would circle + anytime the student had disruptive behavior or did not gain teachers attention, did not ignore inappropriate behavior, did not follow direction.

Social Interaction. The observer put a tally anytime the student would prompt, gestured or told another student to follow rules. For example, a student gesturing another student to be quiet will be counted.

Teachers Praise /Experimenters Praise. The observer put a tally anytime teacher / experimenter made a verbal comment to the target group indicating the target group approval. Eg: Nice work following direction.

Teachers Reprimand /Experimenters Reprimand. The observer put a tally anytime teacher / experimenter made a verbal comment to the target group indicating the target group disapproval. Eg: Group 1 needs to follow teachers' direction.

Modifications. For each school there were certain exceptions. For Classroom A, one student had hand flipping which was defined as any time the student claps with open fist or close fist during the class time/ lesson time it would be marked as – not following directions.

For Classroom B, due to the individual behavior plans for two students the following modifications were considered. One of the students had expectations to sit either outside the classroom or in safe place in the classroom where the student can play with his toys and be safe. If the student wished to join the classroom activity they could, although it was not compulsory. Another student was required to sit in assigned area and play with his toys and be safe. If the student wished to join the classroom activity they could although it was not compulsory. Other students in the classroom could ask for free time for 5 min. If they have a problem transitioning back to the table after the free time and teachers three warning after that it was counted as a disruptive behavior.

For Classroom C, one or two reminders were given to follow rules for a student. This would not be counted against that student. The way dependent variables were collected are outlined Table 1.

Interobserver Agreement

A second observer was independently collected data for a total of 40%, 52% and 47% of sessions for Classrooms A, B and C. Interobserver agreement (IOA) was calculated using the interval by interval agreement method. Interval by interval agreement method was calculated by number of intervals of agreement by total number of intervals and converting results to a percentage. To view the IOA for all the three school see Table 5.

Procedural Fidelity.

We used a 10-item procedural fidelity checklist to determine the use of CW-FIT and GBG intervention components during session. (e.g., skills are prominently displayed on posters, pre-corrects on skills occur at beginning of session, point goal is determined, points are awarded to individuals or teams for use of the skills at set intervals; Wills, Kamps, Fleming & Hansen, 2016). The ratings were scored as yes or no. The fidelity data were collected in intervention phase and for both the intervention. Observers completed the fidelity checklist after every observation. We collected fidelity every time the experimenter/ teacher implemented either of the interventions. Procedural fidelity checklist is outlined in Table 2 and Table 3.

Experimental Design

We used a non-concurrent multiple baseline design across all three schools. All sessions were 10 min in duration. We also embedded an alternating treatments design (CW-FIT and GBG) for Classrooms A and C. For Classroom B, we only implemented CW-FIT at the recommendation of the District Behavior Consultant due to the individual behavior plans for several students which emphasized the removal of reprimands. For school A after low

disruptive behavior was seen in two intervention a generalization probe was done by the teachers.

Procedures

Training of Experimenter. Before beginning baseline the experimenter was trained in CW-FIT and GBG intervention. She received a fidelity checks twice if she was able to implement the intervention successfully. Two fidelity checks were done by a Board Certified Behavior Analyst. The experimenter had to implement intervention with 80% or higher fidelity.

Training for Data Collectors. All the data collectors also received training in collecting data for CW-FIT and GBG. A mock session was conducted prior to baseline. The actors were first year graduate students in applied behavior analysis. They were given copies of definitions and were told to act accordingly in each of the intervention. The sessions were video recorded and shared via university box facility with the data collectors. Data collectors scored the sessions for each intervention. They were required to get 80% interobserver agreement by interval by interval method before they could come to schools to collect data.

Baseline. For CW-FIT and GBG, the interventions the students were taught normally in the class and the primary and secondary observer recorded the data. All the three schools consisted of small group, which was led by teacher. The activities consisted of phonics, sound card activity, written expression and non-fiction writing. For all the students in the class the general rules that the students would have to follow remained the same. During baseline the teacher taught the class as she normally led. If the students were disruptive or not following the rules the teacher would remind them and continue with the class. For example, if a student was calling out several times, the teacher would remind him to raise his/her hand to talk. During the baseline the students were divided into two groups. They were not told,

this was done to collect data separately. The students who has ASD were always kept in group 1 and group 2 consisted of other students with LD and EBD.

Class-Wide Function-related Intervention Teams (CW-FIT). In the first CW-FIT intervention and the subsequent ones the experimenter / teacher explained the CW-FIT contingencies before the lesson is started for the day. The reason the experimenter first implemented the procedures is to model the procedures for the teacher and to implement the procedures with high fidelity. The teacher in Classrooms A and C then implemented CW-FIT while delivering the lesson during generalization phase. Prior to the start of each day, the experimenter / teacher implementing CW-FIT would divide the class in two groups. This group remained the same for the entire day. The experimenter / teacher reviewed the rules, the criteria for winning (i.e. 10 or more than 10 happy smiley faces), and reinforcer for the winning team. Both teams won if they scored equal to or more than the criterion number of happy smiley faces. Whichever team exceeded the criterion, the team with the most happy smiley faces won the game for that day. If both teams were unable to meet the criterion, then whichever team had more smiley faces won the game. During all the CW-FIT phases, the experimenter provided behavior specific praise for appropriate behavior and deliver happy smiley faces on the point board. Team(s) that meet or exceeded the daily goal received the pre-determined reward. Backup reinforcers consisted primarily of brief attention (high fives, cheers, and hugs), play with iPad. The teacher / experimenter held the phone with timer for 10 mins. Every 30 seconds the experimenter / teacher looked (momentary time sampling) up at the group to provide smiley faces and behavior specific praise (Wills, Kamps, Fleming, & Hansen, 2016).

Good Behavior Game (GBG). In the first GBG and the subsequent ones the experimenter/ teacher explained the GBG contingencies before the lesson started for the day. The reason the experimenter first implemented the procedures, was to model the procedures

for the teacher. The teacher in Classroom A then implemented GBG while delivering the lesson during generalization phase. Prior to the start of each day the teacher/ implementer implementing GBG divided the class in two groups. This group remained the same for the entire day. The experimenter / teacher reviewed the rules, the criteria for winning (i.e.10 or less than 10 sad faces), and rienforcer for the winning team. Both teams won if they scored equal to or fewer than the criterion number of sad smiley faces. Whichever team exceeded the criterion, the team with the fewer sad smiley faces won.

During all the GBG phases, token economy was be placed in which student will lose a point for inappropriate behavior. During GBG sessions, the person implementing the GBG gave a sad face on the board under the corresponding team any time a student engaged in disruptive behavior. The person/ experimenter delivering also delivered a verbal statement of which rule was broken by which team. At the end of the session, team that had fewer sad faces then the set criterion won the reward. Backup reinforcers consisted primarily of brief attention (high fives, cheers, and hugs), play with iPad (Donaldson, Fisher, & SungWoo Kahng, 2017).

Classroom teachers in A and C implemented both the interventions during the generalization phase. The data collection form contained a grid broken down by 30 -s intervals up to 10 minutes. Experimenter / teachers praise statement and reprimands were recorded on the frequency basis. All the rules were displayed clearly in front of the students. There was a white card board that was divided into two halves by putting Velcro. The board was 50 by 37.5 centimetres big. The smiley faces were 5.5 by 5.5 centimetres big. Hook and loop tape roll were used to put one side of the tape on the board and the other on the smiley faces. The chart that was displayed to the student see Figure 1, Figure 2 and Figure 3

Generalization.

During generalization phase both the interventions were implemented by classroom teachers. Classroom A and Classroom C teachers implemented both the interventions. See Figure 4.

Social interaction.

For social interaction we looked at if anytime the students engaged in peer encouragement to follow rules to win the game.

Social Validity (Teachers).

Teachers (n=3) completed social validity questionnaire survey about the satisfaction with the procedures used in the study. A survey was sent out using *Qualtrics***.** The questionnaire included 17 questions. Questions were scored using a 4-point scale with ranging from strongly agree to strongly disagree. We included two open ended questions with one question regarding teacher's preference and a reason and another regarding any other comment they had. One of the school teachers was only asked questions regarding CW-FIT as only one intervention was implemented (Wills, Kamps, Fleming, & Hansen 2016). To view social validity questions, see table 4

Students preference.

We asked students their preference regarding CW-FIT and GBG intervention at the end of the intervention. The preference was taken only from two classrooms, A and C who were in generalization phase. Students were given a piece of paper on which a smiley face and sad face was there. Students were asked to cross the face they did not enjoy playing.

Results

Figure 4 displays data from three classrooms. In the baseline all the Classrooms engaged in disruptive behavior. During the CW-FIT and GBG, there was immediate and substantial decrease in disruptive behavior were observed. Disruptive behavior for Classroom A for CW-FIT and GBG during treatment as compared to baseline decreased from 75% to 35% (CW-FIT) and 30 % (GBG). During the generalization phase the disruptive behavior reduced to 0% for CW-FIT and remained 40% for GBG. Disruptive behavior for Classroom B for CW-FIT during treatment as compared to baseline decreased from 90% to 5%. Disruptive behavior for Classroom C for CW-FIT and GBG during treatment as compared to baseline decreased from 80% to 40% (CW-FIT) and 25% (GBG). During the generalization phase the disruptive behavior remained at 40% for CW-FIT and 35% for GBG. Open circle represents a new kid who joined the group, open square represents that there was only one kid present from group 2 and open triangle represent that there was only one kid present from group 1.

Figure 5 displays the percentage of interval of direction were followed across three Classrooms. In the baseline all had low and variable levels of following teacher directions During the CW-FIT and GBG, there was immediate and substantial increase in following directions across the three Classrooms. Following directions for Classroom A for CW-FIT and GBG during treatment as compared to baseline increased from 25% to 65% (CW-FIT) and 75 % (GBG). During the generalization phase the following direction increased to 100% for CW-FIT and 65% for GBG. Following directions for Classroom B for CW-FIT during treatment as compared to baseline increased from 10% to 95%. Following direction for Classroom C for CW-FIT and GBG during treatment as compared to baseline increased from 15% to 60% (CW-FIT) and 75 % (GBG). During the generalization phase the following directions increased to 60% for CW-FIT and 65% for GBG.

Figure 6 displays percentage of interval of off task behavior across Classrooms for group 1 (students with ASD) and Figure 7 displays percentage of interval of off task behavior across Classrooms for group 2 (students with other identified eligibilities). We looked at students who had ASD versus other disabilities in graph 6 and 7, in case there were differences found in the interventions implemented. In figure 6 in the baseline all the Classrooms engaged in off task behavior as the teacher gave directions. During the CW-FIT and GBG, there was immediate and substantial decrease in off task behavior across schools. In Classroom A for both the group 1 and 2 there was lower off task behavior see during CW-FIT as compared to GBG. In Classroom C for group 1 there was no difference seen for off task behavior between the two interventions. In Classroom B there was lower off task behavior see during CW-FIT. In figure 7 we had students with other disabilities. We only had Classrooms C and B as all the students in Classroom A were diagnosed with ASD they were a part of figure 6. There is no clear pattern between the two groups (ASD versus other disabilities) to compare in figure 6 and 7.

Praise and Reprimand.

Figure 8, figure 9 and figure 10 display praise and reprimand of teachers and experimenter during baseline, treatment and generalization phase. The results are varied and hence no clear pattern is seen between each phase in each Classroom.

Social Validity.

Teacher (n=3) expressed overall satisfaction with CW-FIT and GBG intervention. Overall all of the teachers rated agree for all the questions as how they felt both the interventions were, how much they were likely to recommend the interventions to others, help them manage students better. Only on one teacher disagreed to the statement regarding how much their students enjoyed GBG intervention. In the open-ended question one teacher reported that she preferred using interventions individually instead of a group as one of the

students was having a bad day it, ruined others having a good day. Another teacher reported that she would prefer students to earn happy faces instead of sad faces. It seemed more positive to play CW-FIT and students liked it. Third teacher reported that she felt the school was in baseline for too long.

Student Preference.

Students (n=11) primarily responded that they liked playing CW-FIT.

Discussion

All the participants responded to both the interventions CW-FIT and GBG. For Classroom A, CW-FIT was more effective in reducing the disruptive behavior as compared to GBG. No clear patterns were seen for group 1 for Classroom C. Classroom B only had CW-FIT intervention hence cannot be compared. For teacher/ experimenter praise and reprimand we could not find a clear pattern across phases. We did not see any social interactions among group members to tell another member to follow rules.

During the treatment phase in Classrooms A and B, the behavior had increased and then had a drop down. This could be a potential extinction burst or behavior inconsistencies. Although we hypothesised that there would effect on reducing behavior by CW-FIT than GBG because of the positive reinforcement in CW-FIT. It was seen that GBG had slightly more effect in reducing behavior as compared to CW-FIT. This could be because the immediate feedback involved with losing points at that moment when a student did not follow one of the rules. Even though it is reported that CW-FIT was preferred by students it might be because it was momentary time sampling where the experimenter or teacher looked up every 30 seconds and if the students were following directions they would receive smiley face. And if they had a problem behavior in the middle of 30 seconds that would be missed. CW-FIT is not as stringent as GBG hence it might be preferred more.

In Classroom A it was seen that there was significant reduction in the disruptive behavior as compared to baseline. When the generalization probe was done, it was seen that the interventions were effective even with the teacher implementation. It was seen that in generalization the disruptive behavior was zero percent in CW-FIT intervention.

In Classroom C similar effects were see as Classroom A where the disruptive behavior was reduced significantly from baseline to treatment phase. Where there was significant reduction in disruptive behavior seen after CW-FIT and GBG was implemented.

There was no difference seen in both the groups in off task behavior. See figure 6 for percentage of interval of off task behavior across Classrooms.

In figure 6 and 7 we tried to compare students who had ASD with other disabilities to see if any intervention was able to decrease the off task behavior first. Since classroom A had all the ASD students we only had classroom B an C in figure 7. Since in Classroom B only CW-FIT was implemented we only had Classroom C to compare which was not enough as there was only one Classroom to compare.

In Classroom B there were students who had EBD and were seen to walk out of the class during the class time and had non-compliance to come to the classroom. So, the District Behavior Support Consultant had changed their expectation required in the classroom as compared to other students. The expectations were to either sit in a designated place mentioned by the teacher and be safe. Due to the concerns in the classroom it was recommended that only CW-FIT intervention be implemented with this Classroom. As soon as the expectations were lowered it is seen that the disruptive behavior had decreased. In Classroom B similar effects were see as Classroom C where the disruptive behavior was reduced significantly from baseline to treatment phase. Where there was significant reduction in disruptive behavior seen after CW-FIT was implemented. There was a difference seen in both the groups in off task behavior. The group 2 had less off task behavior as compared to baseline. It was the same group that had students with EBD. See figure 6 and 7 for decrease in off task behaviour for group 1 and group 2. We were unable to see a clear difference between group with ASD and other disabilities.

Considering one of the goals for this study was to evaluate the impact of these group contingencies for students with autism in comparison to other disabilities, a limitation of this current study was that recruitment did not allow for the researchers to select and randomize participants into these classrooms. In order to support the needs of the classrooms, the

researchers utilized the groups of students already present. An additional limitation of the study was that there were drawbacks due to data collection, seating position, weather conditions. There was inconsistency in the regularity of data collection during baseline due to weather conditions. Better seating arrangements as data collectors sat behind the students to reduce distraction due to which they may have missed disruptive behavior. Both the data collectors had different view even though they sat next to each other. The angle in which they could see the students differed and hence this was one of the reasons for low IOA. The data was taken by hand and there were many variables to keep track off, which made it difficult to keep track of behaviors. Better training needs to be provided to data collectors according to each Classroom expectations and more time given to teacher training before implementation of the interventions.

It is clear that additional research is needed in this area in order to advance our understanding of group contingencies and how best to utilize these in applied settings such as special education classrooms. Additional research is needed to examine the differences in behavior reduction across specific disability categories. Future research should aim to recruit students more evenly across groups and classrooms to analyze patterns of responding associated with their identified eligibility category. Future research on group contingencies in schools should focus on having the classroom teacher as the primary implementer of the interventions to examine fidelity acquisition and reduction in behavior. Additionally, in this study it was hypothesized that students would engage in social interactions to support their peers in rule following behaviors. In future research, peer support should be emphasized within the rules/instructions delivered to students in order to evaluate if this change increases the peer interaction within the group contingency. Finally, during this study there were several instances where the classroom teacher delayed access to reinforcement following the group contingency (e.g., finishing an activity before providing access). Therefore, future

research should examine the impact of immediate v. delayed reinforcement within these interventions in order to provide information regarding how best to apply these to classrooms.

Future research could address many of the limitations posed in data collection through the use of video recording. This may ensure that data collectors are able to get the same view as the experimenter. Additional training and support for modifications in data collection should be considered if there are individual needs of students to adapt for. Also, on task behavior could be collected by duration method.

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Appendix

Table 1

Behavior Tracker

Date: Name-

Observer – Primary / reliability Start Time: _____ End Time:_____

Name of the Intervention- Number of the school-

Behaviors

Time (seconds)	Disruptive Behavior	Teacher Attention	Ignore inappropriate attention	Follow directions	Off task Group 1	Off task Group 2
0-30	+	+ - n/a	+ - n/a	+ -	+	+
31-60	+	+ - n/a	+ - n/a	+ -	+	+
1:01-1:30	+	+ - n/a	+ - n/a	+ -	+	+
1:31-2:00	+	+ - n/a	+ - n/a	+ -	+	+
2:01-2:30	+	+ - n/a	+ - n/a	+ -	+	+
2:31-3:00	+	+ - n/a	+ - n/a	+ -	+	+
3:01-3:30	+	+ - n/a	+ - n/a	+ -	+	+
3:31-4:00	+	+ - n/a	+ - n/a	+ -	+	+
4:01-4:30	+	+ - n/a	+ - n/a	+ -	+	+
4:31-5:00	+	+ - n/a	+ - n/a	+ -	+	+
5:01-5:30	+	+ - n/a	+ - n/a	+ -	+	+
5:31-6:00	+	+ - n/a	+ - n/a	+ -	+	+
6:01-6:30	+	+ - n/a	+ - n/a	+ -	+	+
6:31-7:00	+	+ - n/a	+ - n/a	+ -	+	+
7:01-7:30	+	+ - n/a	+ - n/a	+ -	+	+
7:31-8:00	+	+ - n/a	+ - n/a	+ -	+	+
8:01-8:30	+	+ - n/a	+ - n/a	+ -	+	+
8:31-9:00	+	+ - n/a	+ - n/a	+ -	+	+
9:01-9:30	+	+ - n/a	+ - n/a	+ -	+	+

Effect of CW-FIT vs GBG

9:31-10:00	+	+	-	n/a	+	-	n/a	+	-	+	+	

Total
Out of

Frequency	Teacher	Dhwani
Praise		
Reprimands		

Frequency
Social Interaction

Table 2

Procedural Fidelity CW-FIT of Dhwani / Teacher

Primary/ reliability Date:

Start Time: _____ End Time:_____ Name of data collector:

Name of the Intervention: Number of the school:

Procedures	**Yes**	**No**
Skills are prominently displayed on posters		
Correct skills demonstrated at the begging of session		
Team point chart displayed		
Predetermined reward		
Daily point goal determined		
Timer/mobile set for 10 minutes		
Points will be awarded to the team(s)/ individual(s) for use of skills. (every 30 seconds) (3 seconds +/-)		
Praise will be provided for appropriately using the skills		
Points will be tallied in the end and winner will be announced		
Reward will be given to the winning team(s)		

Instruction: Put a tally in the column NO when the behavior does not occur as compared to marking a tally every time a rule is followed.

Table 3

Procedural Fidelity GBG of Dhwani / Teacher

Primary/ reliability Date:

Start Time: _____ End Time:_____ Name of data collector:

Name of the Intervention: Number of the school:

Procedures	**Yes**	**NO**
Skills are prominently displayed on posters		
Correct skills demonstrated at the begging of session		
Team point chart displayed		
Predetermine reward		
Daily point goal determined		
Timer set for 10 minutes		
Sad faces will be awarded for not following skills		
The rule that will be broken will be announced every time.		
Points will be tallied in the end and winner will be announced		
Reward will be given to the winning team(s)		

Instruction: Put a tally in the column NO when the behavior does not occur as compared to marking a tally every time a rule is followed.

Table 4

Social Validity

	Strongly Agree	Agree	Disagree	Strongly Disagree
1.The overview training provided me with a basic understanding of interventions	1	2	3	4
2. I enjoyed being an intervention teacher for CW-FIT	1	2	3	4
3.CW-FIT is easy to learn	1	2	3	4
4.I learned new skills to help manage students behavior (CW-FIT)	1	2	3	4
5.I will use CW-FIT skills I learned with future classes	1	2	3	4
6. I will recommend CW-FIT to colleges	1	2	3	4
7. My students enjoyed CW-FIT	1	2	3	4
8. My students were more focused and engaged with CW-FIT	1	2	3	4
9. I enjoyed being an intervention teacher for GBG	1	2	3	4
10.GBG is easy to learn	1	2	3	4
11.I learned new skills to help manage students behavior (GBG)	1	2	3	4
12. I will use GBG skills I learned with future classes	1	2	3	4
13. I will recommend GBG to colleges	1	2	3	4
14. My students enjoyed GBG	1	2	3	4

15. My students were more focused and engaged with GBG.	1	2	3	4

16. Preference for a specific intervention and why

17. Other comments

Table 5

Interobserver Agreement of All The Schools in Percentage (interval by interval method)

School	Disruptive behavior (Range)	Teachers attention (Range)	Ignore inappropriate behavior (Range)	Following Direction (Range)	Off task Group 1 (Range)	Off task Group 2 (Range)	Average	Total
A	78.5 (45-100)	83 (15-100)	82.5 (55-100)	78.5 (40-100)	78 (40-100)	92.5 (65-100)	82.16	40
B	83.5 (50-100)	89 (75-100)	87.5 (70-100)	83.5 (50-100)	82 (60-100)	84.25 (70-100)	83.25	52
C	85.62 (70-100)	81.25 (55-100)	95.62 (75-100)	85.62 (70-100)	91.87 (85-100)	87.5 (70-100)	83.25	47

Table 6

Number of Students Each School and Different Diagnosis for Each Student

School	Total	Diagnosis	Number	Diagnosis	Number	Diagnosis	Number
A	6	ASD	6				
B	5	ASD	2	EBD	2	LD	1
C	5	ASD	2	LD	2	OHI	1

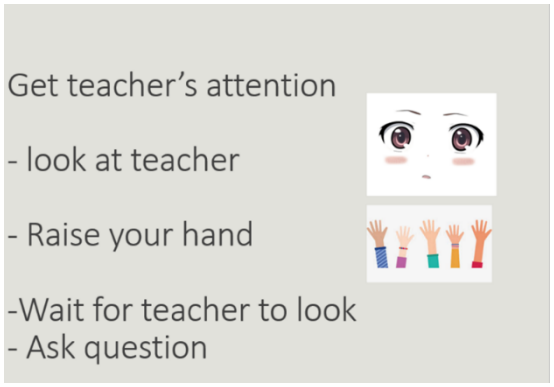

Figure 1. Get teachers attention

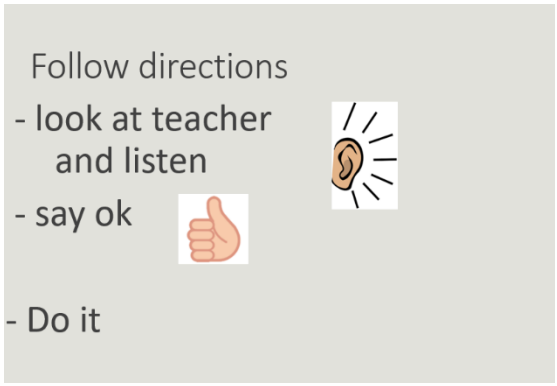

Figure 2. Follow directions

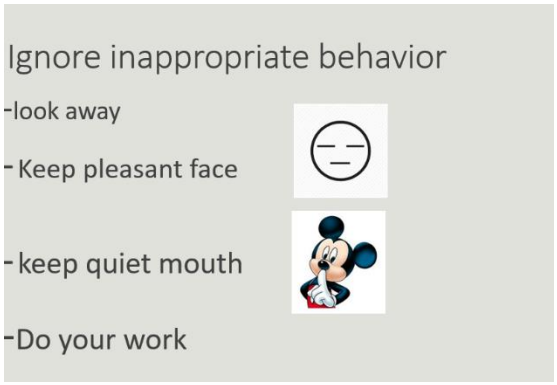

Figure 3. Ignore inappropriate behavior

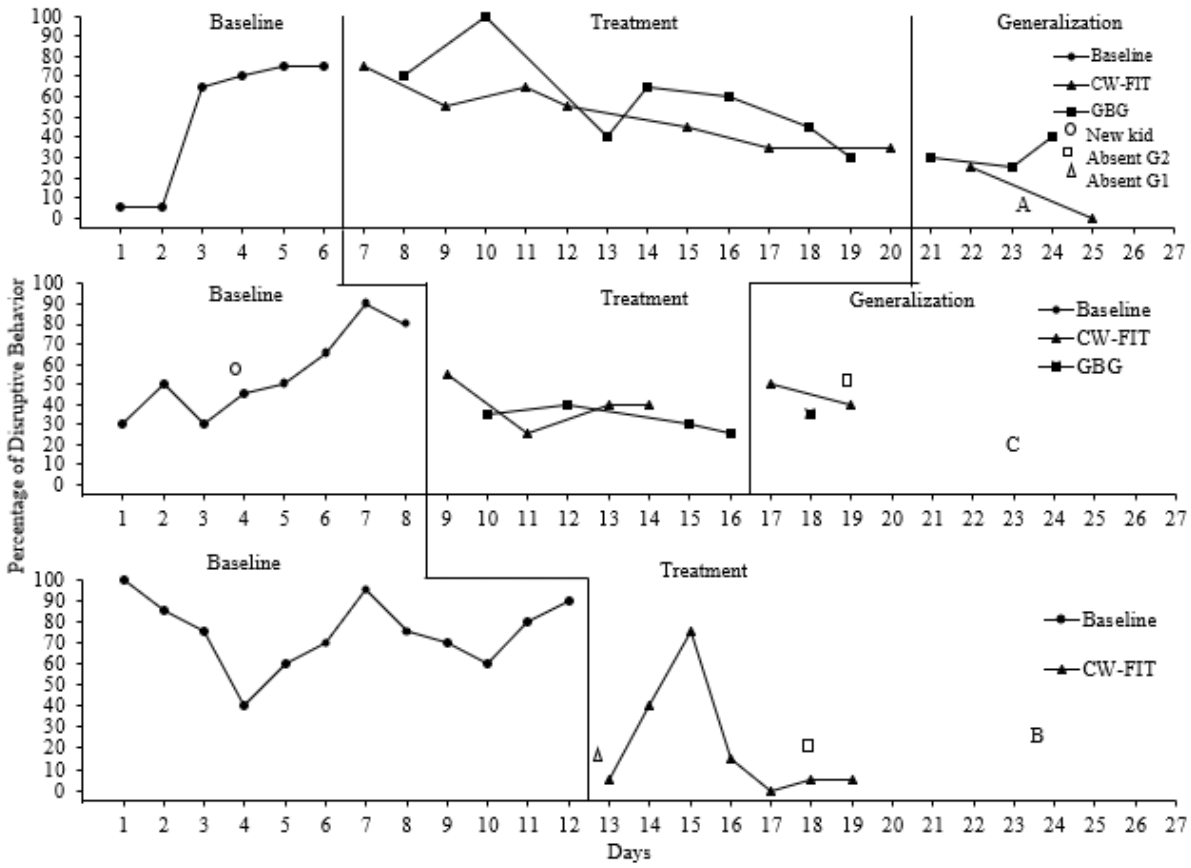

Figure 4. Percentage of disruptive behavior across three schools. An open circle denotes session in which a new kid entered the study. An open square denotes session in which only one kid was present from group 2. An open triangle denotes session in which only one kid was present from group 1.

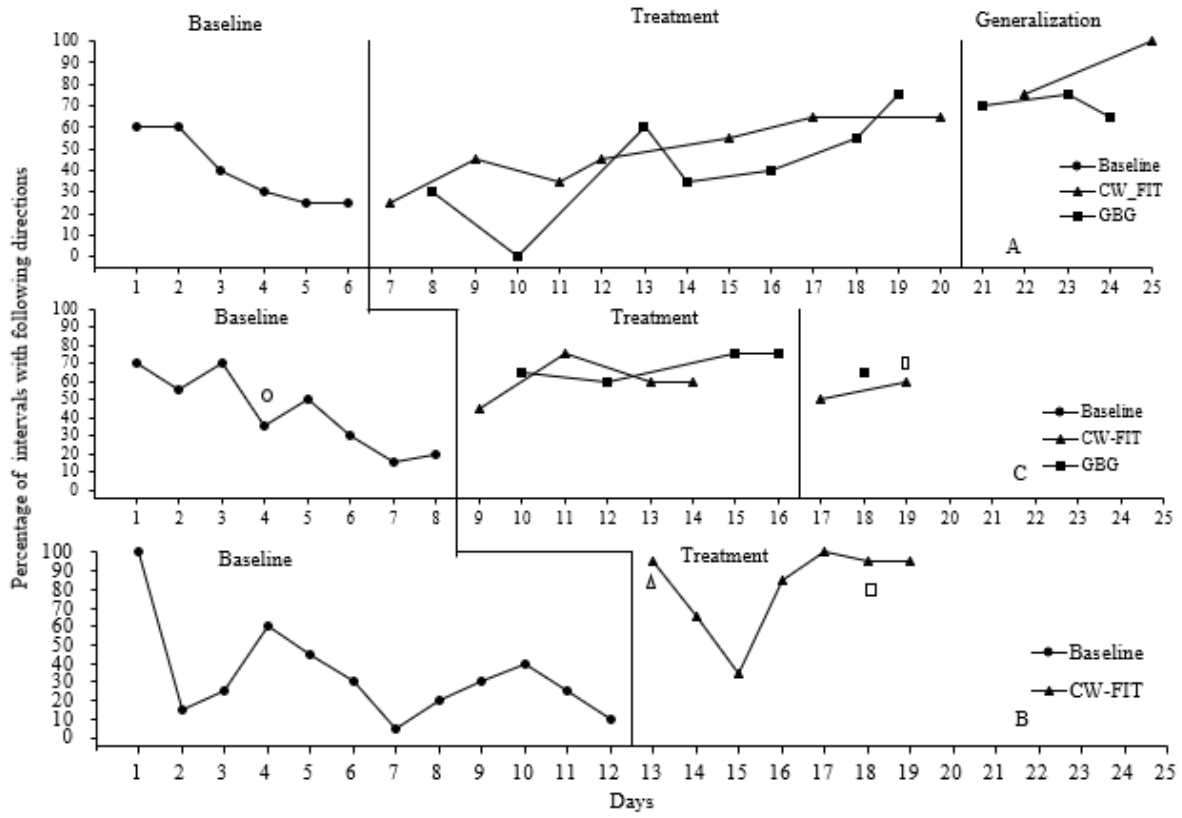

Figure 5. Percentage of interval of direction were followed across three schools.

Effect of CW-FIT vs GBG

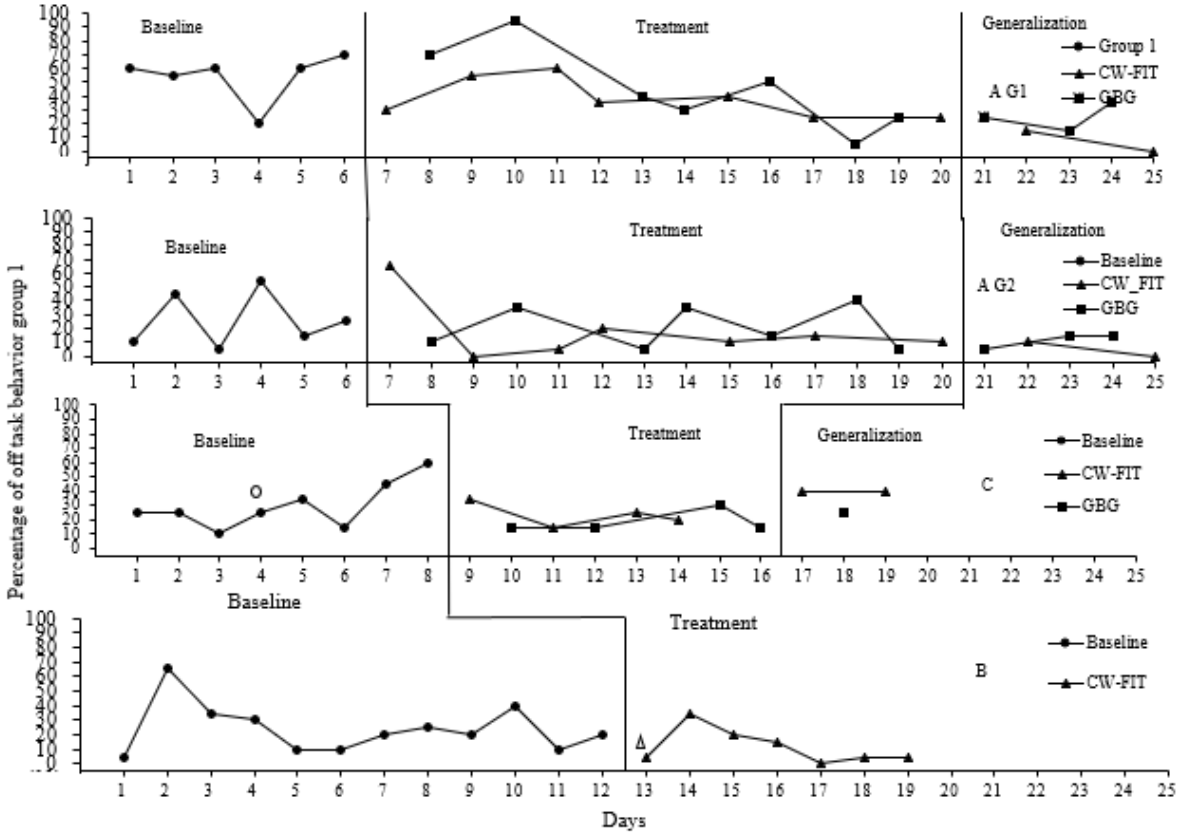

Figure 6. Percentage of interval of off task behavior across schools for group 1.

Effect of CW-FIT vs GBG

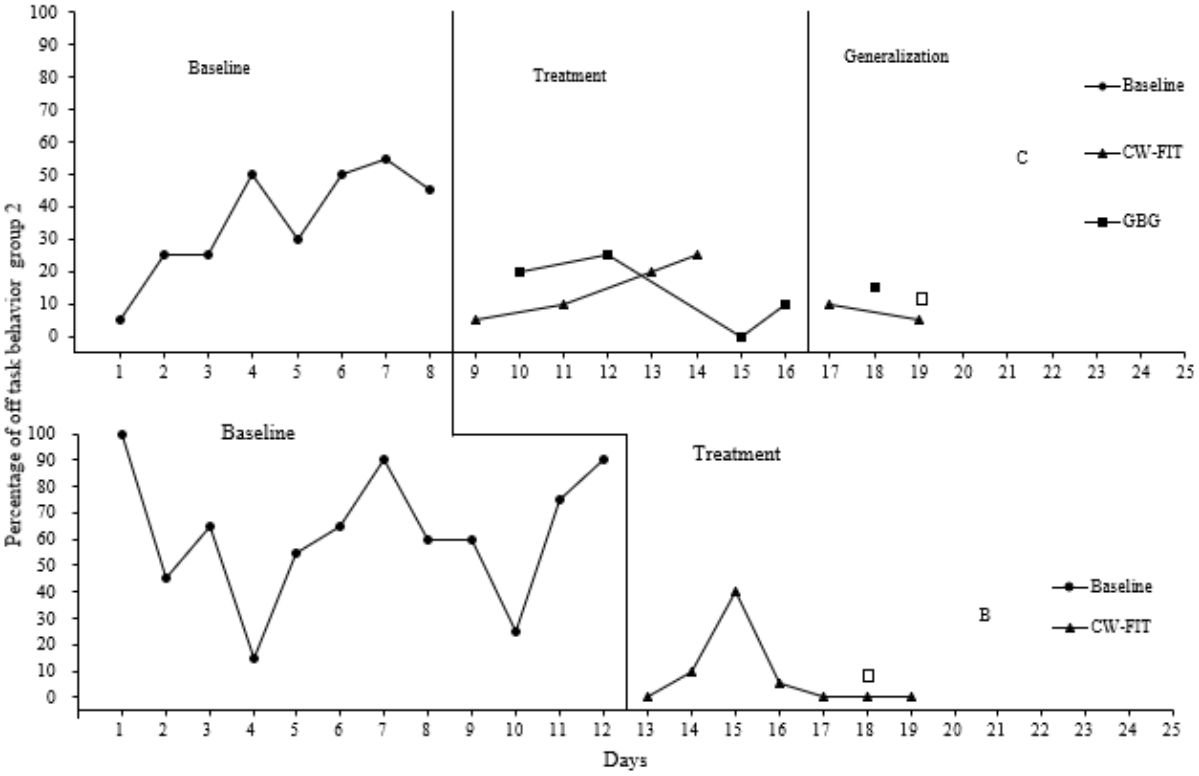

Figure 7. Percentage of interval of off task behavior across schools for group 2.

Effect of CW-FIT vs GBG

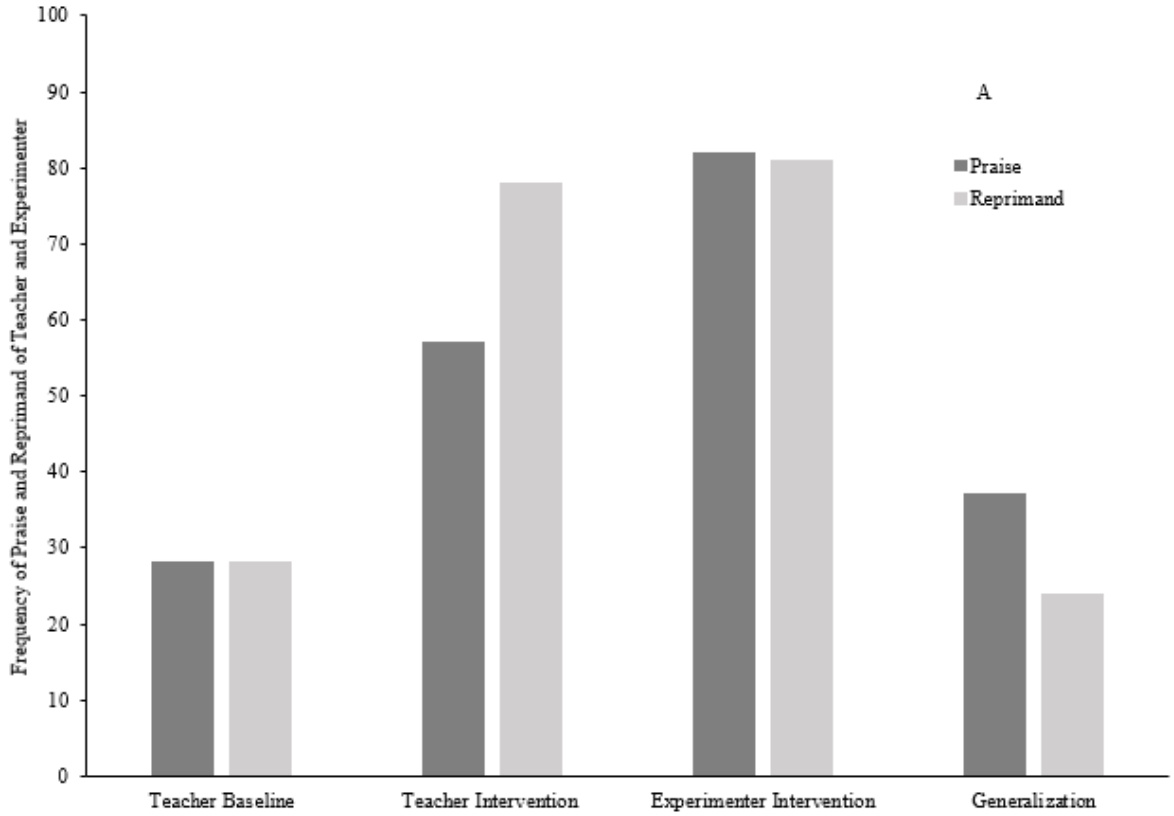

Figure 8. Frequency of praise and reprimand of teacher and experimenter in school A

Effect of CW-FIT vs GBG

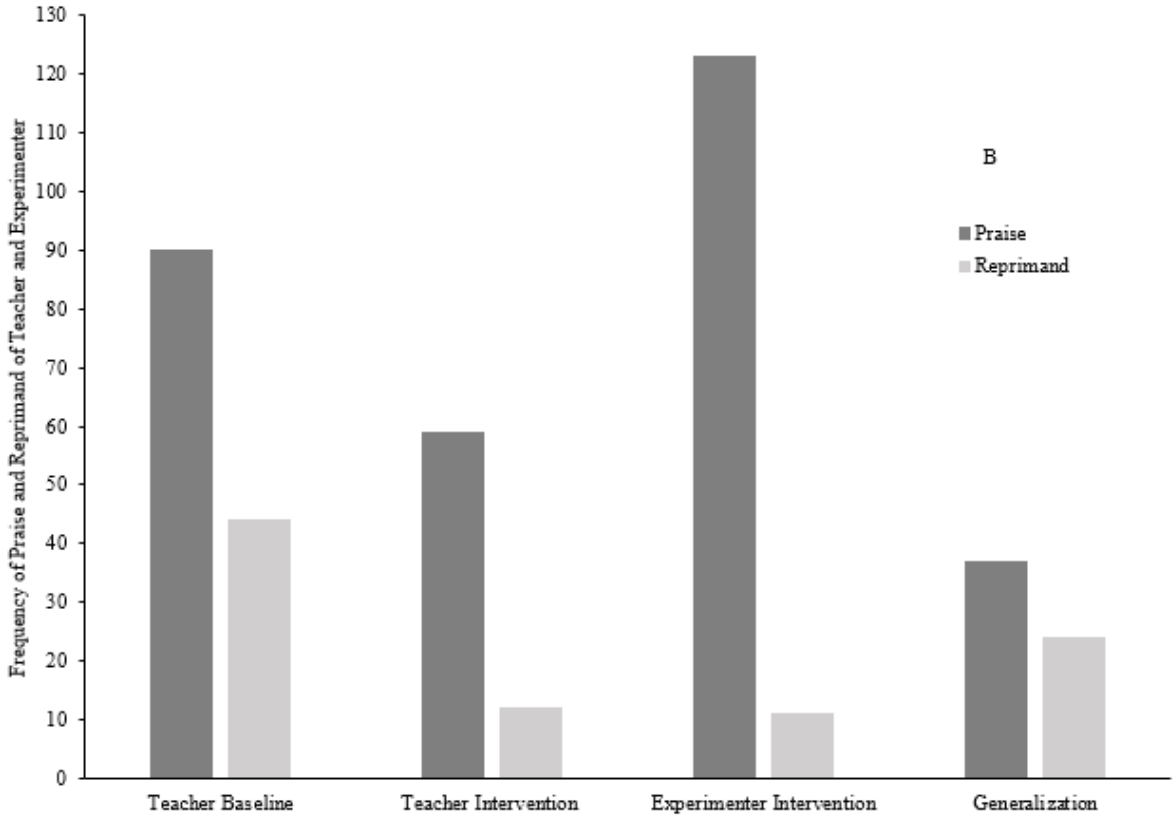

Figure 9. Frequency of praise and reprimand of teacher and experimenter in school B

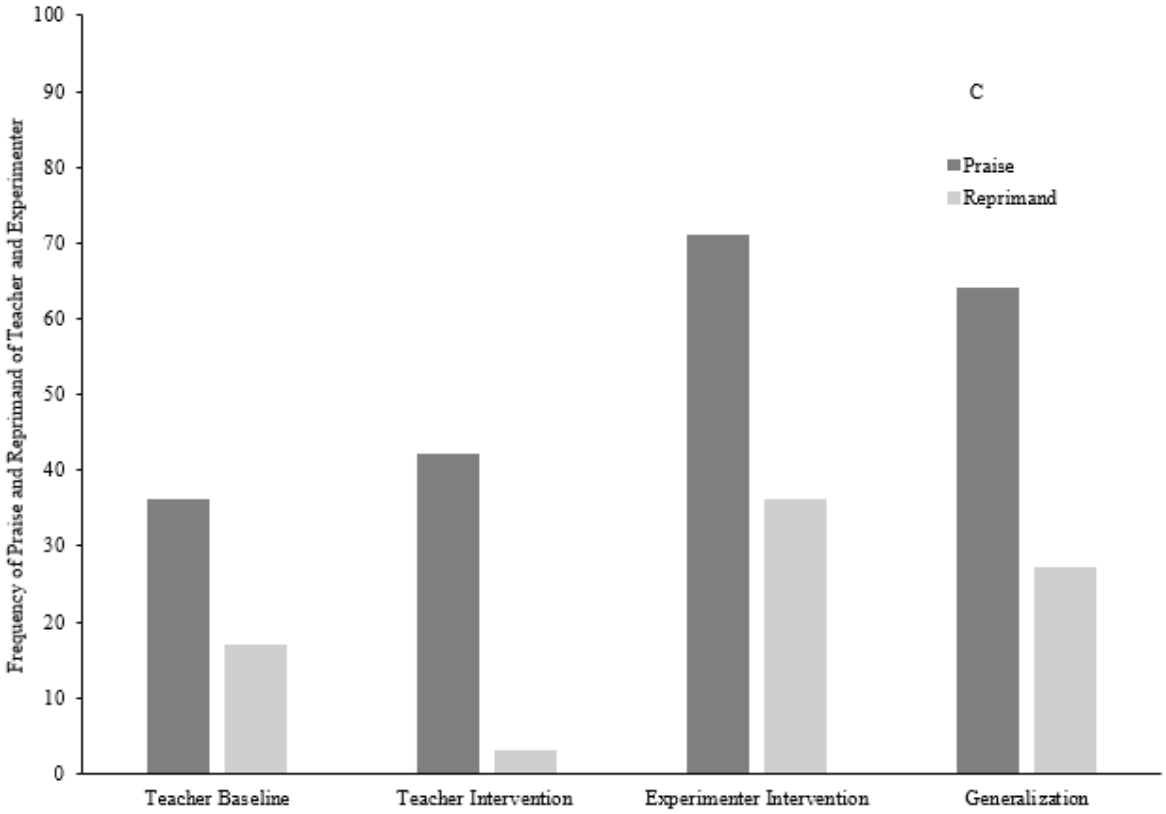

Figure 10. Frequency of praise and reprimand of teacher and experimenter in school C