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Effects of the Good Behavior Game on the On-Task Academic Behavior of Students with Emotional and Behavioral Disorders

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Abstract

The study determined the significant effects of Good Behavior Game in a self-contained classroom on students' on-task academic behavior utilizing a quasi-experimental research design. Respondents of the study were 27 middle schoolers in a self-contained classroom who were diagnosed with emotional and behavioral disorder, and placed academically under the non-intensive needs category. Post-test results for the first on-task dimension, visual attention to work materials, revealed improvement on their ability to stay focused and to control their impulses that encouraged their engagement in the mathematics lesson. In terms of the second on-task dimension, manipulation of materials, data likewise showed improvement after the students' participation with the Good Behavior Game. Additionally, the overall mathematics performance showed high assessment scores of students. Tests of the significance of difference in the on-task academic behaviors and mathematics performance of students before and after the Good Behavior Game indicated a significant improvement, suggesting effectiveness of the game in the promotion of on-task academic behaviors and success in mathematics.

Keywords: Good Behavior Game; emotional and behavioral disorder; on-task behavior.

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1. Introduction

Challenges faced by students with emotional and behavioral disorders (EBD) in maintaining on-task academic behavior can impede learning and disrupt the classroom environment. Students with EBD may exhibit maladaptive behaviors, aggression, classroom disruption, depression, excessive phobias, or obsessive behavior, all of which pose challenges for special education professionals who must develop tailored programs to address their needs. The presence of EBD has been associated with potential disciplinary problems in the classroom and has been confirmed to impact students' academic achievement [1]. Teachers have observed disruptions in routine classroom activities due to EBD, highlighting the importance of addressing these behaviors during early developmental stages [1]. EBD can hinder an individual's ability to adjust to situations and impede their success, motivating educators to focus on preventing problematic behaviors and developing effective intervention strategies to replace them with constructive alternatives. Due to the highly maladaptive behaviors displayed by students with EBD, general education necessitates specialized instruction in self-contained classrooms or special education settings to foster more positive adaptive behaviors [2]. To address emotional and behavioral disturbances, a multifaceted approach is required, which combines proactive classroom strategies, emotional support, and behavioral management since traditional strategies for classroom management may not adequately address students' unique needs.

One strategy adopted as a class-wide intervention is the Good Behavior Game (GBG) which claims to improve academic and behavioral outcomes through encouragement of teamwork, reduction of disruptions, and reinforcing positive behavior, specifically in self-contained classrooms where behavioral issues appear more pronounced. It is used to support students' academic success and address their behavioral and social needs, thus, prevent maladaptive behaviors whenever possible and implement interventions when prevention is not feasible. The GBG is an evidence-based practice designed to reduce negative behavior and promote positive behavior through rewards distributed to students with the most points at the end of the game. Rewarding positive behavior has been found to be more effective than attempting to eliminate negative behavior, as punitive measures can lead to power struggles and worsen problem behaviors.

While the effectiveness of GBG is demonstrated in increasing on-task academic behavior while reducing disruptive and off-task behavior in classrooms, it has been acknowledged that there is a need to explore GBG's role in supporting the development of on-task academic behavior in students [3]. This claim is supported by the [4] stating that studies establishing the importance of GBG in increasing on-task behavior are limited. On-task academic behavior is crucial in effective learning interventions and engagement and has been shown to improve academic focus across diverse educational contexts [5, 6, 7, 8, 9].

Thus, this study was conducted to provide valuable insights into GBG's effectiveness for a group of students facing significant challenges in academic engagement. Furthermore, while GBG is a popular strategy for classroom management designed for promoting students' positive behavior and improvement of academic engagement, there are specific research gaps in its application to students with EBD, specifically in self-contained classrooms. The targeting of students with EBD in self-contained classrooms is relatively scarce, making the understanding how GBG can impact on the particular population is crucial, specifically on GBG's

effects for EBD students when placed in self-contained classrooms [10].

This exploration on the effectiveness of GBG was based on the Operant Conditioning Theory, utilizing positive reinforcement, negative reinforcement, and shaping techniques to stimulate students to develop and maintain on-task academic behavior [11]. Additionally, the study leveraged on the principles of Social Learning Theory in investigating the facilitation of behavior change and enhancement of academic engagement through the use of peer modeling and structured reinforcement. The theory posits that behavior is learned through imitation, observation, and experiences of consequences, based on the principles of modeling.

As educational managers strive to respond effectively to the phenomenon of EBD, this study hoped to offer fresh insights and recommendations to enhance the current level of on-task academic behavior among students with EBD, thereby facilitating an appropriate educational environment. This study which places emphasis on measurable outcomes and practical application, contributes to the growing body of evidence supporting interventions for academic and behavioral improvement among students with EBD.

2. Materials and Methods

This quasi-experimental pretest-posttest study investigated the effects of the Good Behavior Game (GBG) in a self-contained classroom on the on-task academic behavior of middle school students (Grades 7 and 8) in Southeast Alaska, United States. Specifically, it determined the significant effects of Good Behavior Game to the on-task academic behavior of the students in the following dimensions: (1) visual attention to work materials, (2) manipulation of work materials, and (3) achievement in mathematics. This effect was determined through the analysis of the differences in the pre- and post-intervention behaviors under the dimensions stated.

2.1 Participants

The participants of the study were 27 middle schoolers of a self-contained classroom in Schoenbar Middle School in Ketchikan Gateway Borough School District who have been diagnosed with EBD. Chosen through random sampling design, the participants were limited to students under the non-intensive needs category. They exhibited one or more of the indicators such as the inability to learn, maintain or build satisfactorily interpersonal relationships with teachers and peers, inappropriate feelings or behavior under certain circumstances, development of physical symptoms associated with school or personal problems, and general pervasive mood of depression and unhappiness. Students with non-intensive needs receive support through strategies like differentiated instruction, small group instruction, or specific interventions provided by general education teachers.

2.2 Data Collection

Prior to the intervention, approvals and permissions required in the conduct of the experiment was sought from the school head, parents of the respondents, and the teachers who participated in the administration of the assessment forms. All the participants were briefed about the research and were assured of the confidentiality of the responses since the study was intended for academic purposes only. Additionally, the teachers or

experiment facilitators were trained on the procedures and principles of GBG.

The first step was the administration of the assessment for mathematics, specifically in addition, subtraction, multiplication and division. This was followed by the orientation and instruction of the Good Behavior Game, which targeted the development of their on-task academic behavior. The rules, expectations and rewards from the Good Behavior Game were explained, ensuring that the students understood the purpose of the game and the details of its implementation.

The duration of the activities was set for each game session, specifying the activities during each game. The experiment facilitators observed and scored each team's behavior based on the expectations established. Data collected on the on-task academic behavior of students were recorded throughout the experiment utilizing checklists and systematic observation tools.

2.3 Data Analysis

Using appropriate statistical methods, the collected data were analyzed to evaluate the effects of GBG intervention on students' on-task academic behavior. The pre and post intervention data were compared to assess the intervention's effectiveness. The raw scores obtained in the pretest and posttest from the experimental and control groups were gathered and summarized in tabular form using descriptive statistics such as the mean and standard deviation. Significant differences in pre-test and post-test scores were determined through the t-test of difference at 0.05 level of significance.

2.4 Potential Ethical Issues

Since this study involved human participants, ethical issues were considered during the research approach design and approved by the relevant ethical committee prior to data collection [12]. Specifically, the Informed Consent was the cornerstone of ethical practice in this study. Participants were fully informed of the researcher's intent, the data to be collected and how they will be collected, the commitment level required for participants, how data will be reported and used, and the potential risks in taking part of the research. It was made certain that the study participants understood their rights to information access and their right to withdraw at any point.

Being a contract between the respondents of the study and the researcher, the Informed Consent ensured confidentiality and anonymity to protect the study participants from potential harm. The participants' identity was not linked to personal responses through the researcher's management of private information and confidentiality of responses. Responses did not bear their names, but were identified through their number as respondents of the study. They ascertained that they understood their right to withdraw at any time, their consent was obtained freely, as well as their awareness of the research implications.

3. Results and Discussions

3.1 Visual Attention to Work Materials

Table 1 presents the result of the pre-test and post-test for visual attention to work materials before and after the Good Behavior Game. The pre-test, shows that students were "low" in *selective focus on the information in the work materials*, as well as in all other indicators. The grand mean of 2.267, shows the overall "low" pre-test result for the on-task academic behavior of EBD students on visual attention to work materials, supported by the homogeneity of responses, indicated by the average standard deviation of 0.765. This meant that before implementation of the Good Behavior Game, EBD students exhibited various low patterns of visual attention as they could be struggling in maintaining focus on their work materials for extended periods.

Students with EBD can experience intense emotions which can be overwhelming and can interfere with their capability to focus on academic tasks, distracting them from the task on hand (Sciarra and his colleagues 2022). Findings further imply that students' might have frequently wandered which can lead to difficulties in sustaining their engagement with academic tasks due to limited attention span. Comorbid attention deficits can also be experienced by students with EBD which can make it challenging for them to stay on task or maintain visual attention [13]. Students with EBD can struggle with impulsivity that leads to students quickly losing interest in work materials or their engagement in off-task behaviors which can disrupt their ability to effectively attend to tasks [14]. Furthermore, sensory sensitivities can be experienced by students, impacting their visual attention as they encounter difficulty to process information presented visually or distracted by visual stimuli [15].

Table 1: Students' Visual Attention to Work Materials Before and After Good Behavior Game

Indicators	Before GBG			After GBG		
	Mean	SD	Interpret-ation	Mean	SD	Interpret-ation
Selective focus on the information in the work materials, filtering out distractions that are irrelevant	2.33	0.785	Low	4.63	0.492	Very High
Staying engaged in the academic task without easily losing interest	2.15	0.718	Low	4.67	0.480	Very High
Interpreting and organizing visual information in understanding complex work materials	2.44	0.847	Low	4.63	0.492	Very High
Switching attention to different academic tasks using work materials	2.15	0.662	Low	4.59	0.501	Very High
Adaptation to changing demands, allocating attention accordingly	2.26	0.813	Low	4.41	0.501	High
Overall	2.267	0.765	Low	4.59	0.493	Very High

Post test results for visual attention to work materials, show that students improved to a "very high" on *selective focus on the information in the work materials*, as well as in three other indicators. However, the *adaptation to changing demands* improved only to a "high." Nevertheless, the grand mean of 4.59 shows the overall observation of "very high" on the development of visual attention to work materials, supported by the homogeneity of observations, as indicated by the average standard deviation of 0.493. The use of Good Behavior Game provided positive reinforcement, structures, and immediate feedback, which promoted self-regulation, creating an environment in which students can better focus on their academic tasks, leading to improved educational outcomes among students with EBD. Improvement was observed on students' visual attention to work materials after good behavior game implementation, which enabled students to improve their ability for visually attending to work materials.

Results of the statistical test, as summarized in Table 4, rejected the null hypothesis of no significant difference between the pre-test and post test results in terms of visual attention to work materials. This meant that the students demonstrated significant improvement in the on-task behaviour, visual attention to work materials. This finding highlights the effectiveness of the Good Behavior Game intervention in addressing challenges among students with EBD, related to visual attention to work materials, helping students develop the behaviors and skills required in achieving academic success and in engaging productively in learning activities. The game supported students' development of self-regulation skills, providing them with practice opportunities that result in better control of their impulses to make them maintain visual attention on materials relevant to tasks [17]. The consistent feedback and reinforcement of the behavior game enhanced the visual attention to work materials of students, supporting their engagement in the learning activities. It can be said that the implementation of the Good Behavior Game strategies can minimize distractions, promoting students' sustained attention that allow students to stay focused on their work materials [16].

3.2 Manipulation of Work Materials

Pre-test and post-test results for manipulation with work materials of students with EBD are presented in Table 2. Students were "low" in *engaging multiple senses of sight and touch in enhancing the learning experience*, as well as with other indicators. Low manipulation of work materials by students with EBD can be due to skill deficits, as they can have underdeveloped fine motor skills that make tasks requiring manipulation of materials particularly challenging for them [19]. The grand mean of 2.27 revealed an overall "low" score on-task academic behavior of manipulating work materials, supported by the homogeneity of respondents' responses as indicated by the average standard deviation of 0.691.

Table 2: Students' Manipulation of Work Materials Before and After Good Behavior Game

Indicators	Before GBG			After GBG		
	Mean	SD	Interpret-ation	Mean	SD	Interpret-ation
Engaging multiple senses of sight and touch in enhancing the learning experience	2.33	0.734	Low	4.67	0.480	Very high
Experimenting with varied ways by which the work materials could be used	2.19	0.682	Low	4.67	0.480	Very high
Attending to the materials according to individual learning styles, preferences, and needs	2.29	0.734	Low	4.59	0.501	Very high
Developing a sense of ownership for learning as guided by the teacher's instructions	2.37	0.688	Low	4.37	0.492	High
Immediate utilization of the work materials after they have been presented with the teacher's instructions	2.22	0.698	Low	4.41	0.501	High
Overall	2.27	0.691	Low	4.54	0.491	Very high

This low score implies a struggle of students in organizing their work materials, which can lead to difficulty and disorganization of accessing or locating the needed resources for completing tasks. Inconsistent engagement with work materials can be demonstrated by students with EBD, in which they resort to disengagement of active manipulation based on their interest level, difficulty, or emotional taste [20]. Impacting on the manipulation of work materials in students with EBD is the repetition of a particular thought, behavior, or response, which can affect the overall completion of tasks [21].

Table 2 likewise presents the post-test results for manipulation of work materials of students with EBD. Findings show students improved on-task academic behavior for manipulation of work materials, observed as "very high" in three indicators. The grand mean of 4.54, shows the overall improved on-task academic behavior of manipulation of work materials after the implementation of Good Behavior Game, supported by the

homogeneity of responses, indicated by the average standard deviation of 0.491. The finding implies improved ability of students with EBD to develop coordination required for effectively manipulating work materials after participation in the Good Behavior Game intervention.

Furthermore, the results of the statistical test (shown in Table 4) rejected the null hypothesis of no significant difference between the pre-test and post-test in terms of manipulation of work materials. This implies that there was a significant increase in the manipulation of work materials after the Good Behavior Game implementation. The game enabled students to demonstrate increased perseverance in the manipulation of work materials after participating in the game, helping them overcome challenges and continue working towards achievement of academic goals. Good Behavior Game increased academic behavior, physical exercise, and class participation, resulting in improved long-term outcomes for students [22]. Students with EBD can exhibit reduced aggression towards work materials, helping them in the development of healthier ways in interacting with work materials. Students are able to pay closer attention to details in the manipulation of work materials, reinforcing the importance of accuracy, encouraging them to take care in their work [23].

3.3 Mathematics Performance

As shown in Table 3, 22 percent improved from *emerging* level in mathematics ability before GBG to *mastery* after GBG, where students were found to apply the current skills to higher mathematics strategies level. During the *emerging* performance stage, students struggled with staying attentive during lessons that lead to decreased effort and participation. In the absence of structured reinforcement, students were found to exhibit behaviors interfering with learning and lack of focus or motivation, resulting in performance below their potential, and showing weaknesses in mathematical reasoning and problem-solving. Students were found to have limited engagement as they are frequently distracted and experience difficulty in following instructions, thereby hindering their ability to learn. Thus, students had inconsistent math performance with fluctuating scores on assignments and tests, revealing lack of sustained progress.

The application of GBG in mathematics instruction helped students in progressing to a *mastery* level due to the fostering of a more disciplined, focused, and engaged learning environment. The provision of students with visual reminders can enhance routine skill instruction, guiding the actions and behaviors of students during math activities and help them stay focused and on-task during math instruction [31]. The incorporation of positive reinforcement into routine skill instruction motivated these students to stay on-task during math lessons, encouraging them to continue working towards achieving math goals [30]. Students developed high engagement and focus enabling them to actively participate in problem-solving activities and discussions. Their self-regulation and discipline encouraged accountability and teamwork that improve concentration and reduced classroom disruptions. With deep understanding of math concepts, improved behavior, increased motivation and confidence, students achieved consistent high performance that will lead to their overall mathematics proficiency.

Table 3: Overall Mathematics Performance of Students Before and After Good Behavior Game

	Before GBG	After GBG	Frequency	Percentage
Levels of Performance	Emerging	Mastery	6	22.22
	Emerging	Instructional	11	40.74
	Instructional	Mastery	4	14.81
	Instructional	Instructional	1	3.70
	Review	Instructional	5	18.52
Overall Mean Score	7.42	13.81		
Overall Mean Rating	80.04	93.00		
Overall Assessment	Emerging	Instructional		

Additionally, the majority of the students, with 41%, have improved from *emerging* in which students developed math skills through structured learning tasks, to *instructional* in which students learned to incorporate routing skill instruction that strengthened the math skill area. After GBG implementation, these students were found to improve to the *instructional* stage as structured reinforcement for positive behaviors was provided by GBG, encouraging students to actively participate and stay on task. Students exhibited better classroom behavior with the rewards and clear expectations provided by GBG that reduce distractions and fosters a learning environment that is more productive. Enhanced math performance was achieved, as students become better able to grasp concepts in mathematics which leads to higher problem-solving abilities and test scores.

On the other hand, students starting with *instructional* level before GBG and progressing to *mastery* after GBG implementation with 15% showed significant growth in their abilities in mathematics and independent problem-solving skills. The transition highlights the effectiveness of GBG in fostering focus, self-discipline, and independent learning, through reductions of distractions and encouragement for positive classroom behavior. The intervention allows students to gain skills and confidence essential to excel in mathematics, enabling them to achieve deeper understanding and academic success in the long term.

In the *instructional* performance stage, students were found to have foundational understanding of concepts in mathematics, however, they still required structured support and guidance. They had moderate engagement in lessons and occasionally struggled with maintaining motivation and focus, and needed the assistance of the teacher with multi-step operations and complex problem-solving. Application of knowledge was inconsistent and students are hesitant in taking risks to solve challenging problems which affect their ability in working independently. Mathematical scores were generally stable; however, students have not reached full autonomy and proficiency in math tasks. With structured reinforcement of positive behaviors in GBG, students

transitioned from the requirement for instructional support to mastery, making them confident and independent in the application of mathematical skills. After GBG implementation, students were found to have high engagement and focus, deep conceptual understanding, effectively applying them in various contexts and real-world problems, and having strong mathematical reasoning. Test scores of students in the mastery level show continuous improvement, which demonstrate mastery of mathematics subject.

Systematic process was necessary to transition students with EBD form instructional to mastery level, focusing on building behavioral, academic, and social skills, as students in instructional level acquire foundational skills and knowledge requiring significant scaffolding, guidance, and structured environments to become successful in academic performance and demonstrate independence and proficiency in the application of skills [37]. Utilizing data-driven methods and interventions, students with EBD can achieve long-term success in social and academic domains, ensuring their growth toward mastery [38].

In certain cases, GBG may not lead to measurable academic improvement even with improvement in classroom behavior, which can occur as a student at the instructional level prior to intervention still remain in same level after GBG without advancement such as that of one participant in the study. While GBG is effective in improvement of classroom behavior, it may not lead automatically to better academic outcomes. The situation requires additional interventions which can take the form of alternative learning strategies, targeted tutoring, or differentiated instruction, which can help in advancing toward mastery in mathematics. No change in performance outcome after GBG, can be attributed to GBG's focus on behavior management and not on direct instruction, requiring different interventions or teaching methods for students to progress, or students were not fully engaged in mathematics due to lack of interest or motivation resulting in stagnant performance. External factors could have also affected learning, or environmental challenges, personal issues, and learning difficulties could have prevented academic progress. Rather than develop independent problem-solving skills, students continue to depend on guided instruction and reliance on teacher support. Test scores are stable, however, performance does not show significant mastery and improvement.

Finally, there was 19% who progressed from *review* level before GBG to *instructional* after the intervention, indicating improvement (albeit lower) in their understanding and engagement in mathematics. Before GBG implementation, students in the *review* stage required constant reinforcement of concepts previously learned and struggled in applying them independently. They had limited retention of mathematics concepts which needed frequent reviews in recalling problem-solving techniques and basic math operations. Students were found to have passive learning, relying on teacher-led instruction and struggle with higher-order thinking tasks. They had inconsistent performance, fluctuating of scores and showing gaps in understanding and application of concepts to new problems.

With the promotion of structured learning and positive behavior in GBG implementation, students moved from review of concepts to active learning and application. Students were found to consistently stay on task, participate in discussions and more attentively follow lessons. New topics were grasped with less reliance on review, indicating better comprehension. Students attempted problems which were more challenging, with better encouragement and discipline, and with reduced dependence on teacher support. Academic performance became

more consistent, with improved scores, as they demonstrated greater accuracy in reasoning and calculations, allowing them to shift from review to instructional performance. After GBG, these students have developed learning independence, better focus, and confidence in math, and have more engagement in active learning rather than reviewing past lessons, indicating a meaningful progress toward proficiency in mathematics.

The results of the statistical test (presented in Table 4) rejected the null hypothesis of no significant difference between the pretest and post-test in mathematics performance assessment scores. There was a significant difference in the learning potential of students before and after the Good Behavior Game implementation as shown in the mathematics performance assessment scores.

Table 4: Paired Samples Test for Significant Difference between Pre-test and Post-test of On Task Academic Behavior

On-task Behavior	Paired Differences					t	df	Sig. (two-tailed)	Decision on Hypothesis
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper				
Visual attention to work materials	-2.32	0.284	0.055	-2.43	-2.21	-42.38	26	0.000	Reject
Manipulation of work materials	-2.27	0.346	0.667	-2.404	-2.129	-34	26	0.000	Reject
Mathematics Performance	-1.41	0.747	0.144	-1.70	-1.11	-9.79	26	0.000	Reject

4. Conclusions

The findings highlight the effectiveness of the Good Behavior Game in the improvement of on-task behavior in visual attention and manipulation of materials, including mathematics performance. The behaviour game intervention helped students overcome challenges associated with behavior and emotional disturbances, enabling them to succeed academically through the provision of reinforcement, structures, and support for positive behaviors. It provided reinforcement and targeted support allowing students to overcome barriers for achieving success and in demonstrating their full potential in academic settings. This study recommends that to enhance students' on-task academic behavior before and after the Good Behavior Game (GBG), clear

expectations should be outlined, reinforced with visual cues, individualized goals, and immediate feedback. Consistency in implementation across activities, varied reinforcement strategies, and parental involvement will further support success. For effective manipulation of work materials, explicit instruction, modeling, visual supports, structured workstations, and peer mentoring should be utilized, along with reinforcement and progress monitoring. In mathematics, structured, engaging, and differentiated instruction, along with real-world applications, incentives, and small-group support, will aid student progress. Consistent GBG application, positive reinforcement, structured environments, and professional development for teachers will ensure long-term effectiveness. Regular monitoring, parental engagement, and collaboration among educators will further enhance student success.

5. Scope and Limitations

The limited amount of research on the implementation of GBG across a wider range of SENs may be attributed to reservations regarding its suitability for students with specific learning needs. Despite the GBG's capacity for personalized rule-setting and contingencies tailored to individual abilities, certain educators and researchers may presume that the intricacy of these contingencies could pose challenges in utilizing the game with some students, such as those with intellectual disabilities. The study determined the significant effects of Good Behavior Game in a self-contained classroom for emotional and behavioral disorder (EBD) on students' academic behavior. It identified on-task academic behavior before and after the Good Behavior Game intervention in Mathematics. Significant differences in the on-task academic behavior before and after the Good Behavior Game were determined. Respondents of the study are limited to Southeast Alaskan middle schoolers with EBD in the self-contained classroom in the United States. Selection of respondents focused on EBD students with non-intensive needs.

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