



# EFFECT OF BEHAVIOR CONTRACTS ON REDUCING PROBLEM BEHAVIORS AND ENHANCING ACADEMIC ENGAGEMENT IN GENERAL CLASSROOM SETTINGS

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## Abstract

*Many students in schools may demonstrate problem behaviors and show signs of academic disengagement behaviors in schools, especially students who are educated in upper-secondary schools. Exhibition of problem behaviors may negatively affect students' academic performance. These students need to receive effective interventions, such as behavioral contract interventions, to help them behave and learn well. This study aimed to examine the effect of employing behavioral contract interventions in the reduction of problem behaviors and the enhancement of academic engagement in four upper-secondary students who exhibit problem behaviors and show signs of academic disengagement behaviors in general classroom settings. The single-subject research with ABAB design was used as an experimental method to examine the effect of behavioral contract intervention for the four upper-secondary students. All four upper-secondary school students were male students. These students were observed during the study by daily progress reports as a data collection tool by two observers. The results of the study displayed a positive effect on the four upper-secondary students using behavioral contract intervention. All the students had high levels of reducing problem behaviors and increasing academic engagement behaviors. The study found that the behavioral contract intervention was a useful intervention for all the students. These findings indicated that the behavioral contract intervention can be added as part of the school's policy to reduce students' problem behaviors and enhance academic engagement behaviors. Also, the intervention may need to be replicated with another gender, such as female students.*

**Keywords:** academic engagement, contingency contracting, problem behavior, students with behavior issues, school settings

## Introduction

Students who struggle with behavioral issues often experience academic difficulties, as their disruptive behaviors hinder focus and participation. Problem behaviors, including physical behaviors, such as fighting with others, pushing their peers, and pushing, can negatively affect students' academic behavior and relationships with their peers (Owman-Perrott et al., 2015). In the absence of appropriate intervention, these students risk academic disengagement behaviors, leading to further challenges in both school and future work environments. Students with problem behaviors may also injure themselves or others. They may exhibit such behavior to avoid performing undesirable tasks and escape attendance requirements. Students who exhibit problem behaviors need to get effective interventions, such as a behavior contract intervention, to address their problem behaviors.

Owman-Perrott et al. (2015) emphasized the importance of structured behavioral interventions in reducing disruptive behaviors and fostering academic engagement. Behavior contracts, in particular, have been shown to help students transition from exhibiting problem

behaviors to demonstrating appropriate academic conduct. These contracts outline clear expectations and reinforcements, allowing students to make informed behavioral choices. Also, behavioral contract interventions offer a structured approach to address behavioral issues. These contracts involve goal setting, reinforcement strategies, self-monitoring techniques, and providing students with a feeling of control over their acts.

Hawkins et al. (2011) indicated that behavior contracts can be considered effective interventions in modifying problematic behaviors and enhancing academic engagement behaviors for students with autism. For this intervention, teachers need to meet each student required to address his or her behavioral issues, discuss all the aspects of their problems, and choose positive reinforcements. These contracts outline clear expectations and reinforcements, allowing students to make informed behavioral choices. These teachers are trained to manage students with such behavioral problems and turn them into active students. Problematic behaviors and academic disengagement behaviors can extend from the educational environment to the work environment if students with such behaviors receive no intervention. So, students who display problem behaviors and behaviors related to academic disengagement may need to receive effective interventions, such as behavior contract interventions.

Kirk and Rifkin (2020) and Abraham et al. (2020) defined behavior contract interventions as written agreements between teachers or counselors and students that outline specific behavioral expectations. These contracts detail the behaviors students are expected to demonstrate, such as following teacher instructions, completing assignments, sitting appropriately, and showing respect toward peers and teachers. Moreover, behavior contracts help reduce problematic behaviors, such as hitting, throwing objects, and disregarding instructions. Owman-Perrott et al. (2015) further emphasized that behavior contracts foster collaboration between teachers and students, promoting a structured and supportive learning environment.

Behavior refers to an individual's actions and responses in various situations. It can be classified into different categories, such as verbal behaviors (e.g., speaking and responding) and physical behaviors, such as movement, off-task actions, and improper social interactions with others. According to Putri and Sulthoni (2022), behavior encompasses all actions resulting from an individual's interactions with themselves or others.

Olivier et al. (2020) defined problem behaviors as actions that can be categorized into externalizing and internalizing behaviors. Externalizing behaviors include disruptive and aggressive actions such as physical aggression, property destruction, anger outbursts, and off-task behaviors. By contrast, internalizing behaviors, on the other hand, involve emotional and social withdrawal, anxiety, and difficulties in interpersonal interactions.

Academic engagement behaviors refer to students' conduct in school settings that contribute to their learning success. These include following instructions, completing assignments and homework, participating in discussions, answering questions after getting the teacher's permission, adhering to classroom expectations, and bringing necessary materials to class. Musa (2020) highlights that positive academic behaviors enhance students' self-efficacy, confidence, and readiness to learn.

In the literature review, research on school violence has focused on strategies to mitigate aggressive behaviors, such as fighting, kicking, hitting, and verbal altercations. These behaviors may hamper learning and lead to interpersonal problems for the participants, even if the behaviors are not always openly violent. Furthermore, although extreme violence in schools is rare, unchecked minor aggressive behaviors can escalate, leading to a school climate where violence becomes normalized (Wilson et al., 2003).

Additionally, numerous school-based treatment programs are developed to address aggressive behaviors in schools. Durlak and Wells (1998) conducted meta-analyses of preventive mental health programs, incorporating school-based initiatives designed to improve students' social skills. Similarly, Stage and Quiroz (1997) analyzed the effectiveness of interventions

targeting disruptive classroom behaviors, while Dupaul and Eckert (1997) examined school-based strategies for students with attention deficit disorders. These studies consistently found that certain interventions effectively reduce aggressive behaviors and improve classroom conduct (Wilson et al., 2003).

Daily Behavior Report Cards (DBRCs) have been identified as a valuable tool for addressing aggressive behavior in students. Chafouleas et al. (2006) reviewed prior studies on DBRC implementation and found that it serves as both a behavior-monitoring tool and an intervention component. DBRCs typically include clear behavioral expectations, a rating system (often used daily), and structured feedback shared with students, parents, and teachers. The primary goals of DBRCs range from improving academic performance to fostering positive behavioral changes (Chafouleas et al., 2006).

McDougal et al. (2005) on another intervention strategy aimed at addressing behavioral challenges in elementary school classrooms. Their study explored the effectiveness of a behavioral consultation team, a structured intervention model involving behavioral assessments, positive behavioral support strategies, continuous progress monitoring, and program evaluation. Findings revealed that behavioral consultation intervention was successful in resolving behavioral concerns in 75% of cases. Furthermore, the researchers found that the intervention was acceptable and the integrity of the intervention implementation (McDougal et al., 2005).

Mruzek et al. (2007) explored the use of contingency contracts to recover adherence to behavioral expectations in an elementary school setting. Their study focused on two male students: a 10-year-old identified with autism spectrum disorder and a nine-year-old with attention deficit hyperactivity disorder and suspected Asperger's disorder. Before the intervention, both students frequently exhibited challenging behaviors, including threats, vocal outbursts, and physical aggression.

To address these issues, teachers collaborated with the students to develop written behavior contracts, which were revised multiple times as the students progressed. In the final stages of the intervention, self-monitoring techniques were incorporated into the contracts, and a changing criterion model was applied to examine the success of the approach. The results demonstrated that contingency contracts were successful in modifying the students' aggressive behaviors. This study suggests that such contracts can be a useful tool in reducing aggressive actions such as kicking and hitting (Mruzek et al., 2007).

In a broader attempt to identify effective classroom behavior administration strategies, Oliver et al. (2011) did a systematic review of multi-component, school-wide classroom management practices. Their research aimed to assess the effect of these strategies on minimizing disruptive, aggressive, and problem behaviors among students. The study focused on students from kindergarten through 12th grade in various countries with different educational structures. The participants, aged between 5 and 18 years, were observed in public and special education schoolrooms (Oliver et al., 2011). Teachers implemented classroom management practices designed to reduce problematic student behaviors. An in-depth coding protocol and screening sheet were designed to determine the legibility of studies for incorporation into the analysis. Thereafter, the teachers conducted a detailed review of the literature and identified potential studies for inclusion (Oliver et al., 2011).

Findings from the study revealed that comprehensive, multi-component classroom management initiatives significantly reduced aggressive behaviors. Across 12 studies, students in intervention classrooms displayed fewer disruptive and inappropriate behaviors compared to those in control classrooms, where only standard classroom management techniques were applied. These results suggest that educators who implemented universal class management strategies can expect notable improvements in student behavior, creating an environment conducive to effective instruction (Oliver et al., 2011).

Similarly, Sheridan and Deering (2011) examined the effectiveness of residential-based behavioral interventions for a boy with a record of trauma and behavioral issues. The study presented two distinct interventions within a behavior support plan created for a 12-year-old who experienced intense abuse and neglect before being placed in state care. One intervention involved a combination of a token economy and a contingency contracting plus response costs. Results showed that the frequency of problematic behaviors decreased to zero over time. Additionally, a separate intervention targeting personal hygiene led to 100% compliance with daily hygiene tasks (Sheridan & Deering, 2011).

Teachers are considered to play a crucial role in managing classroom behavior effectively. To successfully modify or regulate students' behaviors, educators must establish clear intervention objectives and anticipate potential outcomes. Battalio et al. (2013) examined the experiences of secondary school teachers who teach students who have disabilities. The study required participants to determine the frequency of their behavioral interventions, the strategies they employed, and their perceptions of the effectiveness of these techniques. Four key findings emerged from the collected data, highlighting the effect of teacher-led interventions in addressing challenging student behaviors.

First, teachers tend to respond to behavioral problems that overlap with the instruction of others. Second, they intervene when behaviors become intolerable in a group environment. Third, teachers have less potential to address behaviors they perceive as distractions only to the individual student, as long as they do not pose a challenge to classroom management. Finally, teachers generally prefer strategies that do not require involvement from individuals outside the classroom. From their survey, Battalio et al. (2013) educators' approaches to managing student behavior were either reactive or proactive. While reactive strategies may be necessary in critical situations to prevent escalation, students need more than reactive measures to succeed in secondary schools. This finding highlights the fine line between effective decision-making and missed opportunities for intervention (Battalio et al., 2013).

More recent studies explored the effect of behavioral contract interventions in the enhancement of student behavior and academic performance. Sidiq et al. (2020) conducted a repeated-measures study to compare two behavioral counseling techniques (behavioral contracts & token economies) among 16 junior upper-secondary school students with academic procrastination issues. The students were separated into two experimental groups: one received behavioral counseling with a behavioral contract, whereas the other received counseling with a token economy technique. The findings unveiled that both interventions were positive in reducing academic procrastination. However, students in the behavioral contract group demonstrated a greater reduction in procrastination. The study suggested that behavioral contracts provide clear commitments, consequences, and accountability.

Similarly, Sari and Ayriza (2021) explored the effect of the used group counseling combined with behavioral contracts on students' academic procrastination. Their research, based on a research and development (R&D) model, found that students who participated in group counseling with behavioral contracts exhibited significant improvements in their academic engagement behaviors, such as completing homework and assignments. Both Sari and Ayriza (2021) and Sidiq et al. (2020) concluded that behavioral contracts, particularly when combined with intensive group counseling, are effective in addressing academic procrastination.

Devi et al. (2021) also explored behavioral contract interventions using a pretest-posttest design among kindergarten students. Their study aimed to assess the effectiveness of behavioral contracts in promoting discipline, both academically and non-academically. The results indicated a marked improvement in students' classroom discipline following the intervention, highlighting its positive effect on young learners.

Beyond academic performance, behavioral contracts have also been shown to enhance psychological resilience. Tarihoran et al. (2020) conducted a quasi-experimental study on

students of early childhood teacher education, evaluating the effects of behavioral contract counseling on their psychological strength. After the intervention, all students demonstrated increased self-regulation, emotional control, independence, responsibility, and the ability to manage their thoughts. These improvements contributed to their academic success and overall well-being.

Another study by Yusuf et al. (2017) examined the effectiveness of behavioral contract interventions employing a multiple-baseline cross-variable design with elementary-level students diagnosed with ADHD. Before the intervention, the students displayed maladaptive behaviors such as verbal and nonverbal disruptions, interrupting teachers, and moving and speaking without permission. The results showed that behavioral contracts effectively reduced these maladaptive behaviors, helping students exhibit more appropriate classroom conduct.

Sari et al. (2022) used a single-subject A-B-A design to analyze the effect of behavioral contracts on three upper-secondary school students with disruptive behaviors, such as kicking chairs and tables or speaking without permission during lessons. The intervention successfully reduced these disruptive behaviors, leading to better classroom behavior and engagement during learning activities. Finally, Shenoy et al. (2024) also support the use of behavioral contracts as an intensive intervention in Tier 2 behavioral support frameworks. They emphasize the flexibility of behavioral contracts, which allow teachers, school counselors, parents, and specialists to collaborate as interventionists in supporting students' behavioral development.

Camacho et al. (2024) argued that out-of-school suspension is not an effective approach for addressing students with behavioral challenges. This method is often used as a punitive measure rather than a solution to problem behaviors. By contrast, behavioral contract interventions have been identified as an effective technique for reducing disruptive behaviors and improving academic performance (Camacho et al., 2024). These interventions could be incorporated into school policies as a structured approach to support students struggling with behavior management. Schools should provide appropriate educational environments that address the needs of their students, particularly those who show problem behaviors (Camacho et al., 2024). Similarly, Alhossein (2021) highlighted behavioral contract interventions as an evidence-based intervention for improving both academic and non-academic behaviors. While these interventions have been widely implemented in various educational settings, their use in Saudi Arabia remains limited. Alhossein (2021) found that few studies have investigated the effect of behavioral contracts in Saudi Arabian schools, especially for students who are diagnosed with emotional and behavioral disorders. Based on the study's literature review results, the gap of previous studies was determined as seen in the following section.

### *Research Problem*

Various researchers (e.g., Alwahbi, 2020; Tarihoran et al., 2020) have studied the effect of behavioral contract interventions, particularly among students, both with and without disabilities, in elementary and middle schools. These research studies have supported the success of behavioral contracts in enhancing student behavior. However, there is a notable gap in the reviewed studies focusing on upper-secondary school students, particularly in Saudi Arabia. Additionally, existing studies have explored various strategies to reduce problematic behaviors, such as aggression or classroom disruptions, and most have primarily focused on adolescents. Numerous studies (e.g., Chafouleas et al., 2006; Mruzek et al., 2007; Sidiq et al., 2020) have emphasized that contingency contracting can effectively modify student behavior and promote positive conduct.

### *Research Aim and Research Questions*

The literature strongly supports using a behavioral contract intervention for reducing problematic behaviors and fostering appropriate classroom conduct. Moreover, behavioral contract interventions have proven beneficial in academic disengagement and improving student motivation. However, there is a lack of practical studies on using behavioral contracts in general education settings, particularly for upper-secondary school students with behavioral challenges. This study's purpose was to examine how behavioral contracts can help students with behavioral challenges by using behavioral contract interventions to enhance students' academic engagement behaviors and reduce their problem behaviors. In the following, the study question that the study aimed to answer by using an experimental design is:

- What is the effect of behavioral contracts in reducing problem behaviors and enhancing academic engagement behaviors among upper-secondary students in general classroom settings?

## **Research Methodology**

### *General Background*

In this study, many studies have been reviewed (e.g., Alwahbi, 2020; Chafouleas et al., 2006; Tarihoran et al., 2020; Sidiq et al., 2020) that indicated behavioral contract interventions were a practical intervention for addressing problem behaviors in students. However, A gap in the existing literature exists regarding focusing on upper-secondary students, especially in Saudi Arabia. For this study, a single-subject approach was adopted to examine the behavioral contract intervention on four upper-secondary school students in Saudi Arabia. The single-subject design was utilized to explore the effect of behavioral contract intervention on how the intervention can help reduce upper-secondary students' problem behaviors and enhance their behaviors related to academic engagement. This study utilized an experimental single-subject design to test the effect of behavioral contract intervention for upper-secondary school students exhibiting problem behaviors and academic disengagement. The design followed an A-B-A-B withdrawal structure. The design was structured around six phases: two phases for baseline measurement, two phases for intervention, one phase for generalization, and one for maintenance. This design allows for the observation of students before, during, and after the intervention, as well as the withdrawal, generalization, and maintenance phases. This ensures a comprehensive evaluation of the effect of behavioral contract intervention on individual student behavior.

### *Setting*

The study was performed at a public upper-secondary school in Rafha, Northern Borders Region, Saudi Arabia. The school serves approximately 400 students and operates between 7:00 a.m. and 1:00 p.m., with each class session lasting 50 minutes.

### *Participants*

Four male upper-secondary school students were within the age range of 15–18 years old. Students 1 and 2 were in Grade 11, while Students 3 and 4 were in Grade 12. All four students frequently displayed disruptive behaviors, including making noise, throwing objects, and expressing anger. They also demonstrated academic disengagement, such as failing to complete homework, refusing to participate in classroom activities, not cooperating with their peers during classwork, and not responding to teachers' questions or instructions. Each student

was individually observed for five classroom sessions to document their behavioral patterns and academic engagement levels. Table 1 provides a detailed breakdown of each student's specific behavioral and academic challenges.

**Table 1**  
*Demographic Information for the Four Students*

| Student | Grade | Age              | Problem behaviors                                                                                                                                                            | Target of problem behaviors                                                                                                                      | Academic disengagement behaviors                                                                                                                                                        | Target academic engagement behaviors                                                                                                                                                        |
|---------|-------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | 17    | 11 <sup>th</sup> | Throwing his objects, refusing teachers' requests, hitting and threatening others, moving and speaking in the classroom without permission, joking, making disruptive noises | Listening to teachers' instructions, following teachers' requests, seeking permission before speaking or moving, and communicating appropriately | Failing to complete academic tasks and homework, sitting inappropriately, avoiding participation in classroom discussions and group work, and failing to bring required class materials | Completing class assignments and homework, sitting properly, willing to participate in answering teachers' questions and group work, being ready, and bringing all materials into the class |
| 2       | 18    | 11 <sup>th</sup> |                                                                                                                                                                              |                                                                                                                                                  |                                                                                                                                                                                         |                                                                                                                                                                                             |
| 3       | 17    | 12 <sup>th</sup> |                                                                                                                                                                              |                                                                                                                                                  |                                                                                                                                                                                         |                                                                                                                                                                                             |
| 4       | 18    | 12 <sup>th</sup> |                                                                                                                                                                              |                                                                                                                                                  |                                                                                                                                                                                         |                                                                                                                                                                                             |

In addition, the four teachers who educated the students and two observers participated in the study. The teachers included subject teachers for Mathematics, Arabic, English, and Science. The teacher's responsibility is to participate in the implementation of the intervention procedures. Additionally, the two male graduate students served as observers, responsible for collecting data on the students' behaviors. Both teachers and observers received two training sessions on how to implement the behavioral contract intervention, collect, and code data across all six phases of the study design.

#### *Independent Variable (Behavioral Contract Intervention)*

The independent variable was the behavioral contract intervention, a written agreement formed between the students and their school counselor. The contract outlined target behavioral goals (appropriate behaviors and academic engagement behaviors), problematic behaviors (undesired behaviors that should be minimized or eliminated), and rewards and consequences (incentives for positive behavior and penalties for violations). Each student reviewed the contract individually with the school counselor, who explained all expectations. Once the students fully understood the agreement, they signed it. During the intervention phase, students met with the school counselor daily to discuss their progress in adhering to the contract.

#### *Dependent Variables*

The behavioral contract intervention aimed to reduce two dependent variables, namely problematic behaviors and academic disengagement behaviors. The difficult behaviors included throwing objects, refusing teachers' requests, hitting and threatening others, moving and talking in the classroom without permission, joking, and making disruptive noises. The academic disengagement included failing to complete academic tasks and homework, sitting inappropriately, avoiding participation in classroom discussions and group work, and failing to

bring required class materials. The intervention also sought to increase two dependent variables: appropriate behaviors and appropriate academic engagement behaviors. The target appropriate behaviors were listening to teachers' instructions, following teachers' requests, seeking permission before speaking or moving, and communicating appropriately. The appropriate academic engagement behaviors were completing class assignments and homework, sitting appropriately in class, participating in discussions and group activities, and being prepared with all required materials.

### *Instruments*

Multiple measurement instruments were used in this study. These tools included Social, Academic, and Emotional Behavior Risk Screener, Antecedent-Behavior-Consequence assessment, daily progress report, and social validity survey. These tools are discussed in the below sections.

Social, Academic, and Emotional Behavior Risk Screener was used to determine students at risk of behavioral, emotional, and academic difficulties. This tool consists of 19 items divided into three categories: social behaviors, academic behaviors, and emotional behaviors. Teachers were required to assess their students by using this tool to determine eligibility for participation in the study (Kilgus et al., 2021).

Each student was observed in their classroom by using an Antecedent-Behavior-Consequence assessment to record and analyze the triggers of antecedents, behaviors, and consequences of their actions. Each student's behaviors were observed and recorded in recording each student before, during, and after exhibiting behaviors. This data sheet was used before starting the study to help understand each student's behavior.

Two daily progress reports were used. One was used to report and monitor each student's problematic and academic disengagement behaviors. Another daily progress report was used by two trained observers to monitor each student's behavior throughout all study phases. Observers collected data simultaneously for each student in their respective classrooms. A minimum of 90% agreement between the two observers was required for data reliability. If the agreement fell below 90%, the data was reviewed for accuracy. The observers' data served as the primary source for evaluating the intervention's effectiveness. Another daily progress report was used by classroom teachers to assess each student's behavior throughout class sessions. This assessment was used during the application of the study (Stage et al., 2012).

Social validity surveys were also used to measure perceptions of the intervention. Social validity surveys were adapted by Witt et al. 1985 and developed by Umbreit et al. 2007. This instrument was used and supported by many studies (e.g., Gann & Kunnavatana, 2016). It was administered to both students and their teachers before and after implementation. The surveys included open-ended and multiple-choice questions. Administering the survey twice allowed for a comparison of perceptions before and after the intervention, helping to determine whether participants' attitudes were revised as a result of the behavioral contract intervention. Both students and teachers had given the survey two times with the same questions, and open questions that helped these participants to provide all their opinions about the intervention.

### *Procedures*

This study followed several procedure steps, categorized into three primary phases: before the study, during the study, and after the study. Each phrase is detailed below.

First, before implementing the study, the researcher obtained approval from the scientific research ethics committee of Northern Borders University and the Education Research Centre at the Ministry of Education. Once approved, a presentation was conducted for the school

administration and educators to describe the intent of the study and the behavioral contraction intervention. After the presentation, informed consent forms were acquired from the school principal, teachers, students, and their parents to confirm their participation in the study. Moreover, all participants, including students, their teachers, and observers, obtained training sessions on the intervention procedures. After the training, both students and teachers completed pre-intervention social validity surveys to gather their initial perceptions of the intervention.

Second, throughout the study, two trained observers monitored the four participating students by using the DPR while they attended their classes in all study phases. Observations were conducted for 15 minutes per session in each student's class during the school day. To ensure reliability, the inter-observer agreement needed to be at least 90%. Each student's teacher also used a separate DPR tool to evaluate and record student behavior. At the end of each class, educators engaged in individual discussions with students to provide feedback, reinforce positive behaviors, and encourage improved behavior when necessary.

The study employed a six-phase design, comprising two phases of the baseline followed by two phases of the intervention, followed by generalization and maintenance phases. During both baseline phases, the observers monitored each student without administering the intervention. During both intervention phases, the two observers continued to monitor each student after administering the intervention. During the intervention phases, each student met the school counselor daily to discuss behavioral goals, received rewards or reinforcement for achieving the goals, and received additional guidance if they struggled to meet expectations.

During the generalization phase, the two observers monitored the students in a different classroom with teachers who were not part of the intervention to assess whether students generalized the learned behaviors. During the maintenance phase, the two observers reassessed students' behavior three months after the intervention had been completed to determine long-term effectiveness.

Third, at the conclusion of the experimental study, both students and teachers finished the social validity survey to evaluate their post-intervention perceptions. These responses helped determine the effect of the intervention in reducing problem conduct and improving academic engagement. Following data collection, all study data were analyzed and are presented in the results section.

### *Data Analysis*

All data collected regarding each student's behavioral problems and academic engagement behaviors was presented visually as results of the study in graphs. This visual data can help to identify each student's target behaviors visually and the level of improvement by looking at each phase. Also, this can help to determine the correlation between intervention and target behaviors (Horner et al., 2005). Moreover, Microsoft Excel (2021) was used to visualize data and generate graphs. Moreover, many types of statistical methods were included, such as mean-level analysis, percentage of data without overlap (PND), and p-values. The calculation of PND and also p-values were employed to assess the effect of the behavioral contract intervention on the four upper-secondary students. The Web app developed by Tarlow and Penland (2016) was used to calculate the percentage of nonoverlapping and data representing proportions in each baseline phase 1 vs intervention phase 1 and baseline phase 2 vs intervention phase 2. Result indications of PND that are above 90% indicate a strongly effective intervention, 50% to 70% indicate questionable effective intervention, and less than 50% indicate unreliable intervention (Alresheed et al., 2013). Tarlow and Penland supported that the use of PND and p-values are useful statistical ways that can be used for effect size measurement, especially with a single-case experimental design and a small sample size of participants.

## Research Results

The study found that the behavioral contract intervention was successful in addressing the targeted behaviors in reducing problem behaviors, such as refusing teachers' requests and making disruptive noise, and enhancing academic engagement behaviors as finishing academic assignments and tasks, and sitting appropriately.

### *Problem Behaviors*

Table 2 displays the statistical results of the intervention's effect on reducing problem behaviors among the four students. The findings indicate that the behavioral contract intervention had a significant helpful effect on all participants. For Student 1, problem behaviors decreased significantly by 41% ( $p < .0025$ ) between baseline phase 1 and intervention phase 1, and by 25% ( $p < .025$ ) between baseline phase 2 and intervention phase 2. For Student 2, problem behaviors were reduced by 50% ( $p < .0025$ ) between baseline phase 1 and intervention phase 1, and by 33% ( $p < .025$ ) between baseline phase 2 and intervention phase 2.

For Student 3, problem behaviors decreased by 63% ( $p < .0025$ ) between baseline phase 1 and intervention phase 1, and by 42% ( $p < .025$ ) between baseline 2 and intervention phase 2. For Student 4, problem behaviors were reduced by 23% ( $p < .0025$ ) between baseline phase 1 and intervention phase 1, and by 15% ( $p < .025$ ) between baseline phase 2 and intervention phase 2. Additionally, during the generalization and maintenance phases, all four students maintained reduced behavioral problems compared with the baseline phases. However, the most significant improvements were observed during the intervention phases, suggesting that the behavioral contract intervention was most effective when actively implemented.

**Table 3**

*Descriptive Results of All Four Students in the Reduction of Problem Behaviors*

| DV                | Students | Mean %<br>(SD) |           |           |          |           |           | % Shift       |               | PND              |                  | P vaule          |                  |
|-------------------|----------|----------------|-----------|-----------|----------|-----------|-----------|---------------|---------------|------------------|------------------|------------------|------------------|
|                   |          | A-1            | B-1       | A-2       | B-2      | G         | M         | A-1 vs<br>B-1 | A-2 vs<br>B-2 | A-1<br>vs<br>B-1 | A-2<br>vs<br>B-2 | A-1<br>vs<br>B-1 | A-2<br>vs<br>B-2 |
| Problem Behaviors | 1        | 53<br>(5)      | 12<br>(4) | 28<br>(2) | 3<br>(2) | 18<br>(4) | 14<br>(1) | 41<br>reduced | 25<br>reduced | 100              | 100              | .0025            | .0025            |
|                   | 2        | 56<br>(4)      | 6<br>(4)  | 34<br>(4) | 1<br>(2) | 10<br>(4) | 21<br>(7) | 50<br>reduced | 33<br>reduced | 100              | 100              | .0025            | .0025            |
|                   | 3        | 72<br>(6)      | 9<br>(6)  | 46<br>(6) | 4<br>(2) | 20<br>(3) | 14<br>(3) | 63<br>reduced | 42<br>reduced | 100              | 100              | .0025            | .0025            |
|                   | 4        | 29<br>(5)      | 6<br>(2)  | 16<br>(4) | 1<br>(2) | 12<br>(3) | 14<br>(3) | 23<br>reduced | 15<br>reduced | 100              | 100              | .0025            | .0025            |

Note. A-1 = Baseline; B-1= Treatment; A-2 = Baseline; B-2 = Treatment; G = Generalization; M = Maintenance; DV= Dependent Variables; SD= Standard Deviation.

### *Academic Engagement Behaviors*

Table 3 presents statistical data on the effect of behavioral contract intervention in enhancing academic engagement behaviors among the four students. The findings indicate a positive effect of the intervention, with all four students benefiting from its implementation. For

Student 1, academic engagement behaviors increased significantly by 40% ( $p < .0025$ ) between baseline phase 1 and intervention phase 1, and by 30% ( $p < .025$ ) between baseline phase 2 and intervention phase 2. For Student 2, academic engagement behaviors increased by 57% ( $p < .0025$ ) among baseline phase 1 and intervention phase 1, and by 4% ( $p < .025$ ) between baseline phase 2 and intervention phase 2.

For Student 3, academic engagement behaviors increased by 79% ( $p < .0025$ ) between baseline phase 1 and intervention phase 1, and 21% ( $p < .025$ ) between baseline phase 2 and intervention phase 2. For Student 4, academic engagement behaviors increased by 42% ( $p < .0025$ ) among baseline phase 1 and intervention phase 1, and by 31% ( $p < .025$ ) throughout the second baseline phase and the subsequent intervention phase. Both the first and second intervention phases demonstrated a greater increase in academic engagement behaviors compared with both phases (generalization and maintenance) for all four students. However, only Student 1 continued to show an increase in behaviors related to academic engagement in both phases (generalization and maintenance) versus the first and second baseline phases. By contrast, Students 2, 3, and 4 exhibited better improvements in academic engagement behaviors, but the increase in the baseline of the two phases was greater than within the generalization and maintenance phases.

**Table 4**  
*Descriptive Results of All Four Students in the Increase of Academic Engagement Behaviors*

| DV                 | Students | Mean %<br>(SD) |           |           |           |           |           | % Shift         |                 | PND              |                  | P value          |                  |
|--------------------|----------|----------------|-----------|-----------|-----------|-----------|-----------|-----------------|-----------------|------------------|------------------|------------------|------------------|
|                    |          | A-1            | B-1       | A-2       | B-2       | G         | M         | A-1 vs<br>B-1   | A-2 vs<br>B-2   | A-1<br>vs<br>B-1 | A-2<br>vs<br>B-2 | A-1<br>vs<br>B-1 | A-2<br>vs<br>B-2 |
| Academic Behaviors | 1        | 15<br>(3)      | 55<br>(7) | 42<br>(2) | 72<br>(4) | 43<br>(2) | 44<br>(4) | 40<br>increased | 30<br>increased | 100              | 100              | .0025            | .0025            |
|                    | 2        | 8<br>(2)       | 65<br>(3) | 43<br>(3) | 56<br>(7) | 52<br>(6) | 39<br>(8) | 57<br>increased | 4<br>increased  | 100              | 100              | .0025            | .0025            |
|                    | 3        | 1<br>(2)       | 80<br>(4) | 67<br>(5) | 88<br>(5) | 37<br>(5) | 33<br>(4) | 79<br>increased | 21<br>increased | 100              | 100              | .0025            | .0025            |
|                    | 4        | 12<br>(3)      | 54<br>(5) | 38<br>(2) | 69<br>(6) | 37<br>(4) | 32<br>(2) | 42<br>increased | 31<br>increased | 100              | 100              | .0025            | .0025            |

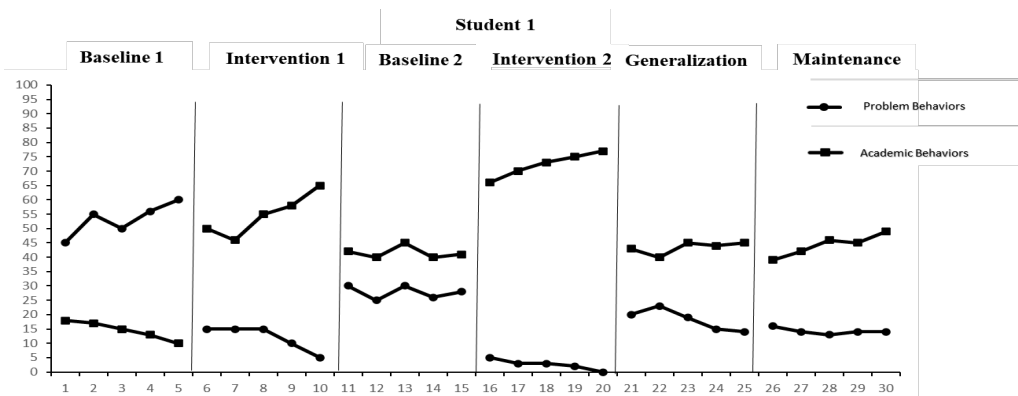
Note. A-1 = Baseline; B-1= Treatment; A-2 = Baseline; B-2 = Treatment; G = Generalization; M = Maintenance; DV= Dependent Variables; SD= Standard Deviation.

#### *Reduction of Problem Behaviors and Enhancing Academic Engagement Behaviors*

Student 1. Figure 1 presents a graphical and visual representation of problem behavior occurrences and also behaviors related to academic engagement for Student 1 across all study phases. The results indicate that the behavioral contract intervention was beneficial in reducing problem behaviors and also enhancing behaviors related to academic engagement for this student.

**Figure 1**

*Reduction of the Problem Behaviors and Enhancing Academic Behaviors in Student 1*

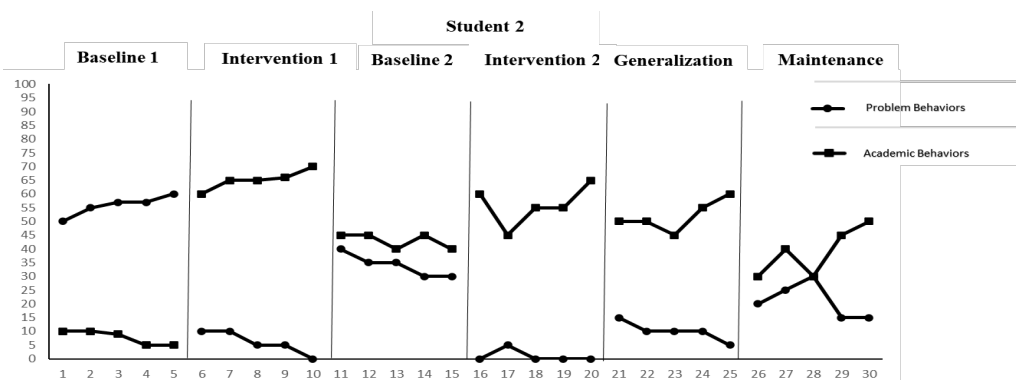


For problem behaviors, within the first phase of baseline measurement, Student 1 exhibited problem behaviors at a rate of 53% ( $SD = 5$ ). Upon introduction of the behavioral contract intervention, problem behaviors were reduced to 12% ( $SD = 4$ ). There was no data overlap ( $PND = 100\%$ ), and they were monitored from the baseline to the intervention phases. Throughout the baseline phase 2, problem behaviors increased to 28% ( $SD = 2$ ) but dropped to 3% ( $SD = 2$ ) when the intervention was reintroduced through intervention phase 2. Again, no data overlap was observed ( $PND = 100\%$ ) among the second phases of baseline and intervention. In the generalization phase, Student 1 exhibited 18% ( $SD = 4$ ) problem behaviors. In the maintenance phase, problem behaviors were further reduced to 14% ( $SD = 1$ ).

For academic engagement behaviors, in baseline phase 1, student 1 exhibited academic behaviors at a rate of 15% ( $SD = 3$ ). Upon introduction of the behavioral contract intervention, academic engagement behaviors increased to 55% ( $SD = 7$ ). There was no data overlap ( $PND = 100\%$ ), and they were monitored within the first phases of baseline and intervention. Throughout baseline phase 2, academic behaviors were 42% ( $SD = 2$ ) but increased to 72% ( $SD = 4$ ) when the intervention was reintroduced. Again, results point out that no data overlap occurred ( $PND = 100\%$ ) between the second baseline and intervention phases. In the generalization phase, academic engagement behaviors were 43% ( $SD = 2$ ). In the maintenance phase, academic engagement behaviors remained at 44% ( $SD = 4$ ).

Student 2 in Figure 2 presents a graphical and visual representation of problem behaviors and behaviors related to academic engagement. For Student 2, across all study phases, the results indicate that the behavioral contract intervention was found useful in reducing problem behaviors and enhancing behaviors related to academic engagement.

**Figure 2**  
*Reduction of the Problem Behaviors and Enhancing Academic Behaviors in Student 2*



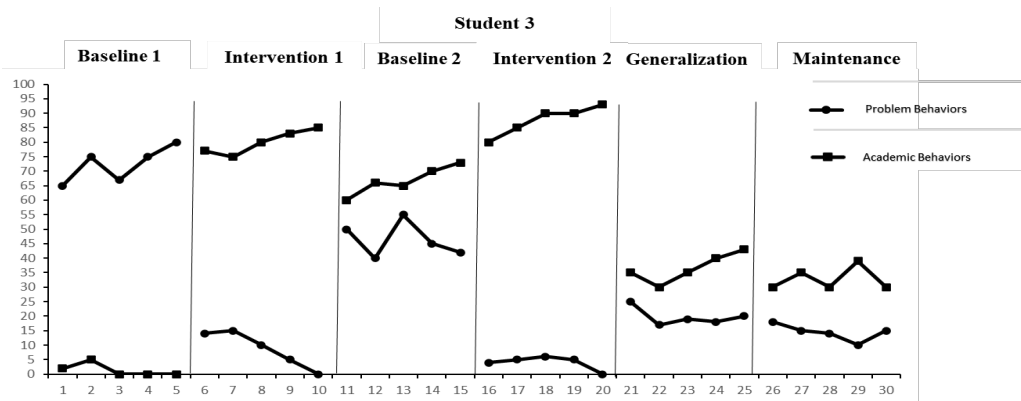
For problem behaviors, the percentage of exhibited problem behaviors was 56% ( $SD = 4$ ) during phase one of the baseline. After presenting the behavioral contract intervention, this percentage decreased to 6% ( $SD = 4$ ). Results indicated no data overlap occurred ( $PND = 100\%$ ) among the first phases of baseline and intervention. Throughout baseline phase 2, Student 2 exhibited 34% ( $SD = 4$ ) of problem behaviors, which further decreased to 1% ( $SD = 2$ ) after the intervention was reimplemented again in the second phase of intervention. Again, there was no data overlap ( $PND = 100\%$ ) observed within the second phases of baseline and intervention. In the generalization phase, student 2 problem behaviors were observed at 10% ( $SD = 4$ ). Through the maintenance phase, the percentage increased to 21% ( $SD = 7$ ).

For academic engagement behaviors, Student 2 exhibited 8% ( $SD = 2$ ) of academic behaviors in phase one of the baseline. Following the behavioral contract intervention introduced within the phase of baseline, the percentage reached an increase of 65% ( $SD = 3$ ), with no data overlap ( $PND = 100\%$ ) among the first phases of baseline and intervention. Through the second phase of baseline, Student 2 exhibited 43% ( $SD = 3$ ) of academic engagement behaviors, which further increased to 56% ( $SD = 6$ ) after the intervention was reintroduced in the second phase of intervention. Again, there was no data overlap ( $PND = 100\%$ ) observed between the second phase of the baseline and intervention phases. In the phase of generalization, academic behaviors were observed at 52% ( $SD = 6$ ). Through the maintenance phase, the percentage slightly declined to 39% ( $SD = 8$ ).

Student 3 in Figure 3 illustrates a graphical and visual representation of the percentage of problem behaviors as well as behaviors related to academic engagement for Student 3 across all phases. The behavioral contract intervention was a successful intervention for reducing behavioral problems and enhancing academic engagement behaviors for student 3.

**Figure 3**

*Reduction of the Problem Behaviors and Enhancing Academic Behaviors in Student 3*

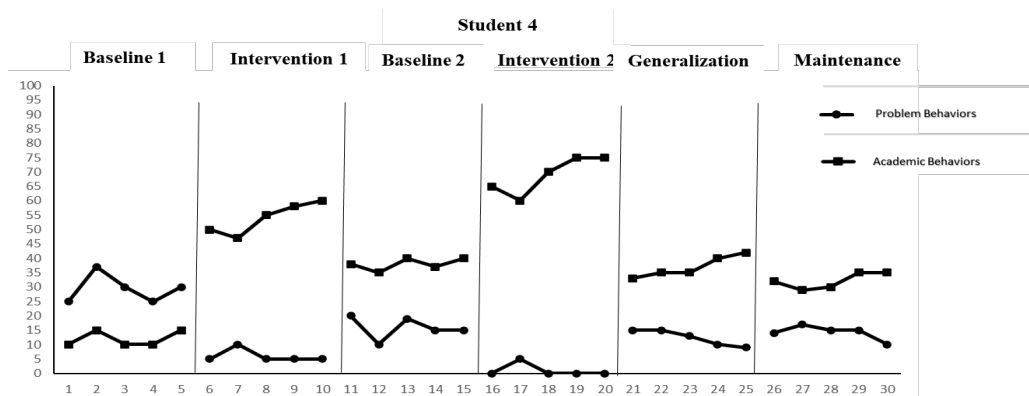


For problem behaviors, Student 3 exhibited 72% ( $SD = 6$ ) of problem behaviors in baseline phase 1. After the behavioral contract intervention was introduced in the first phase of the baseline, the percentage dropped to 9% ( $SD = 6$ ), and no data overlap occurred ( $PND = 100\%$ ) between phases one of the baseline and intervention. Through baseline phase 2, Student 3 exhibited 46% ( $SD = 6$ ) of problem behaviors, which further reduced to 4% ( $SD = 2$ ) after the intervention was reintroduced through intervention phase 2. Again, no data overlap occurred ( $PND = 100\%$ ) among the second phases of the baseline and intervention. Through the generalization phase, the measured percentage of observed problem behaviors was 20% ( $SD = 3$ ), while through the maintenance phase, the percentage reduced further to 14% ( $SD = 3$ ).

For academic engagement behaviors, Student 3 exhibited only 1% ( $SD = 2$ ) of academic engagement behaviors through phase one of the baseline observation. After the behavioral contract intervention was introduced through phase one of the baseline, there was an increase in this percentage to 80% ( $SD = 4$ ), with no data overlap ( $PND = 100\%$ ) among the first phases of baseline and intervention. Through baseline phase 2, Student 3 exhibited 67% ( $SD = 5$ ) of academic engagement behaviors, which further increased to 88% ( $SD = 4$ ) when the intervention was reintroduced through the second intervention phase. No data overlap occurred ( $PND = 100\%$ ) in the second phase of the baseline phase to the intervention phase. The percentage of academic engagement behaviors was 37% ( $SD = 5$ ) through the phase of generalization. However, through the maintenance phase, the percentage reduced further to 33% ( $SD = 4$ ).

Student 4. Figure 4 presents a graphical and visual representation of the measured percentage of problem behaviors as well as behaviors related to academic engagement for Student 4 across all phases. The behavioral contract intervention was found to be a useful intervention in reducing problem behaviors and enhancing academic engagement behaviors for Student 4.

**Figure 4**  
*Reduction of Problem Behaviors and Enhancing Academic Behaviors in Student 4*



For problem behaviors, Student 4 exhibited 29% ( $SD = 5$ ) of problem behaviors in baseline phase 1. After the behavioral contract intervention was introduced throughout phase one of the baseline, the percentage was reduced to 6% ( $SD = 2$ ), and to phase one of the intervention. Through the second phase of the baseline, Student 4 exhibited 16% ( $SD = 4$ ) of problem behaviors, which further reduced to 1% ( $SD = 2$ ) after the intervention was reintroduced once again in the second phase. Results point out that no data overlap occurred ( $PND = 100\%$ ) among the second phases of the baseline and intervention. Through the generalization phase, the problem behaviors percentage was 13% ( $SD = 3$ ), while through the maintenance phase, the percentage reduced further to 14% ( $SD = 3$ ).

For academic engagement behaviors, Student 4 exhibited 12% ( $SD = 3$ ) of academic engagement behaviors in the first phase baseline. Subsequently, the behavioral contract intervention was introduced during the first phase of baseline; the percentage went up to 54% ( $SD = 5$ ), with no data overlap occurring ( $PND = 100\%$ ) from the first phase of baseline to the first phase of the intervention. Through baseline phase 2, Student 4 exhibited 38% ( $SD = 2$ ) of academic behaviors, which further increased to 69% ( $SD = 6$ ) after the intervention was reintroduced through the second intervention phase. Again, no data overlap occurring ( $PND = 100\%$ ) was observed between the second baseline and intervention phases. In the generalization phase, academic engagement behaviors were observed at 37% ( $SD = 4$ ). Within the maintenance phase, the observed percentage slightly declined to 32% ( $SD = 2$ ).

#### *Social Validity*

Both students and teachers responded positively regarding the social validity assessment of the behavioral contract intervention before and after the study. Before implementation, participants expressed optimism about the intervention's potential benefits. They indicated that the behavioral contract intervention can help reduce problem behaviors and improve behaviors related to academic engagement. At the end of the research period, all students and teachers confirmed that the behavioral contract intervention was highly beneficial in reducing problem behaviors and enhancing behaviors related to academic engagement. Educators also mentioned that the intervention was easy to implement and manage their students' behaviors. Moreover, all students reported benefiting from the intervention, stating that it helped them manage their behaviors and exhibit good academic behaviors.

## Discussion

The results of the research study found that the behavioral contract intervention was a useful intervention for all participating students. Findings indicated that all four upper-secondary students benefited from the behavioral contact intervention, in addressing problem behaviors and enhancing academic engagement behaviors. The primary goal of the study was to evaluate the outcomes of the behavioral contraction intervention in reducing problematic behaviors and enhancing academic engagement among four male upper-secondary school students, and to identify that the intervention showed a positive effect for the two independent variables.

All four students exhibited a notable reduction in problem behaviors following the intervention. Initially, they displayed high percentages of problem behaviors through the first baseline phase. However, after they received both phases of the intervention, their problem behaviors decreased markedly. A comparison of both baseline phases confirms that the students benefited from the intervention in reducing problem behaviors. It was clear that all four students reduced their problem behaviors and enhanced the display of academic engagement behaviors after receiving the intervention.

Student 4 exhibited only 29% of problem behaviors observed throughout the first phase of baseline, while the other students displayed problem behaviors exceeding 50%. Despite this variation, all four students reduced their problem behaviors to below 10% during the second intervention phase. Moreover, the generalization and maintenance phases showed that all four students continued to exhibit fewer problem behaviors compared to the first baseline phase. This suggests that the intervention helped students generalize what they had learned in different settings and retain these behavioral improvements over time. The data from the study found consistent results with those of other research (e.g., Edgemon et al., 2021; Sari et al., 2022), which also found that behavioral contract intervention is a useful intervention in reducing problem behaviors. Moreover, behavioral contract intervention is considered an evidence-based intervention not only for reducing problem behaviors but also for enhancing academic engagement behaviors (Mruzek et al., 2007; Sidiq et al., 2020).

At the beginning of the study, none of the four students demonstrated academic engagement behaviors, such as raising their hands to answer questions and completing their homework. The results indicated that all four upper-secondary students initially showed low levels of academic engagement. However, after the intervention was introduced, they significantly increased their academic engagement behaviors. Furthermore, through the generalization and maintenance phases, all four upper-secondary students demonstrated sustained high levels of academic engagement behaviors when their behaviors were compared with the first baseline phase. This suggests that the behavioral contact intervention not only helped students enhance academically but also enabled them to generalize and retain these positive behaviors over time. These results also found the same findings as other research (e.g., Lederer & Stolow, 2021; Nurudducha, 2024; Sari & Ayriza, 2021), which support the effect of behavioral contract interventions in enhancing academic engagement behaviors.

Finally, the study results indicated a direct relationship between problem behaviors and academic engagement behaviors: as problem behaviors decreased, academic engagement behaviors increased. This finding aligns with the results of other studies (e.g., Edgemon et al., 2021; Nurudducha, 2024), demonstrating that behavioral contract interventions effectively reduce problem behaviors while promoting academic engagement. Additionally, the intervention helped students improve self-regulation and manage both academic and non-academic engagement behaviors. All four participants who participated in the study were initially identified as being in danger of exhibiting problem behaviors and academic disengagement. However, after the intervention was implemented, they all demonstrated significant improvements, reducing problem conduct and increasing academic engagement behaviors. The study's findings

indicated similar results to other studies (e.g., Alwis, 2023; Fatimah et al., 2023; Yusuf et al., 2017) that supported the use of behavioral contact intervention for reducing problem behaviors and enhancing behaviors related to academic engagement.

### *Limitations and Recommendations*

The study has several limitations, along with recommendations for future studies and practices. First, the study involved a limited number of participants. The study included only four male students. Future research should expand the sample size and examine the effect of the intervening female students. Second, participants were in danger of exhibiting problem behaviors and academic disengagement. Future studies should assess the intervention's effectiveness among students diagnosed with behavioral and emotional disorders or learning disabilities. Third, direct observations were used to collect data while students attended their classes, which may have influenced their behavior due to awareness of being monitored. Future research should consider using security cameras or alternative observation methods to capture more natural behavior.

Each study phase included only five sessions, which may not have been sufficient for students to fully internalize the intervention. Future research should extend the number of sessions in each phase by at least 10. Data collection was limited to specific classes, meaning students were not observed across all their subjects. Future research should assess students' behaviors across multiple classroom settings to determine the intervention's broader effectiveness. Social validity surveys were conducted privately, which may have limited the depth of feedback received. Future research could incorporate face-to-face interviews to obtain more detailed insights about participants' experiences with the intervention.

### **Conclusions and Implications**

In the literature review, many studies support the use of the behavioral contract intervention, especially with students who show problem behaviors and behaviors related to academic engagement. However, there is a notable gap that the intervention used with upper-secondary school students in Saudi Arabia, and this study aimed to explore how the intervention helped the four Saudi male upper-secondary students reduce behavioral problems and enhance academic disengagement behaviors. The findings obtained from this study revealed that behavioral contract interventions were an intervention proven to reduce problem behaviors and enhance behaviors related to academic engagement for all four students. Based on the study's findings, behavioral contract interventions were an effective intervention and recommended for use in educational settings to support students' academic and behavioral development.

The study suggested several implications for teachers, students, schools, and stakeholders. Behavioral contract interventions can assist students in managing their behaviors and behaving well in school. Also, teachers can use the intervention as a strategy with their students who exhibit behavioral problems and academic disengagement behaviors. The intervention can help teachers to enhance their students' behaviors and educational performance. The behavioral contract intervention can be the role of the school's policy to address students' problem behaviors. Moreover, as a result of the investigation's literature, there is a gap in the research on the investigation of the effect of using behavioral contract intervention in Saudi Arabia. Future researchers should implement the behavioral contract intervention with different students in Saudi Arabia, such as students with and without disabilities who are enrolled in different school grades.

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## Declaration of Interest

The authors declare no competing interest.

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