

Decreasing the Inattentive Behavior of Jordanian Children: A Group Experiment

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Abstract

The present study investigated the efficacy of using response cost paired with Differential Reinforcement of Incompatible Behavior (DRI) to manage the inattentive behavior of 30 students attending third and fourth grade in Jordan. A pretest- posttest control group design was employed to evaluate the efficacy of response cost and DRI. Results showed that students who were instructed using response cost and DRI strategies reduced their inattentive behavior significantly compared with students in the control group. In addition, there was a significant difference between experimental group means on the posttest and follow-up, which occurred two weeks following the completion of the intervention. Issues regarding future research and implications for practice are discussed.

Jordan is located at the heart of the Middle East with a population of approximately 5.9 million and a surface area that is relatively similar in size to Pennsylvania. The percentage of youth in Jordanian society is relatively high. Using the definition of youth adopted by UNESCO (15-24 years), the percentage of youth in the Jordanian population is 23%, while the figure for those below the age of 15 is 39.6% (Imaddin, 2004). Taking into consideration the international prevalence of disability estimated by the United Nations is 10 %; this means that Jordan is expected to have approximately 590,000 individuals with disabilities. Although it has limited resources, Jordan has been able to achieve notable progress in different areas related to disability. In 1993, Jordan passed the Welfare of Handicapped Persons Law, which shifted the responsibility of providing appropriate educational services for individuals with disabilities from the Ministry of Social Affairs to the Ministry of Education. In addition, the National Council for the Handicapped was formed to organize and propose policies and

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programs relevant to special education and rehabilitation (Hadidi, 1998).

Consequently, Jordan has witnessed an increase in terms of public awareness about disability, an increase in the number of facilities and forms of service delivery, positive changes in supporting partial and full inclusion efforts in schools and in communities, and improvement in early intervention programs targeting young children and their families. Currently, universities in Jordan graduate a number of highly qualified special educators each year to teach children with disabilities in different settings (Yousef & Hadidi, 1992).

Attention Deficit Hyperactivity Disorder (ADHD) is one of the disorders that has not received much attention from professionals and the community in general in Jordan. One reason that might explain this is the difficulty in distinguishing ADHD from learning disabilities. According to Mercer (1992), 20% to 75% of children who are identified as having learning disabilities are eligible to be identified as having ADHD. Therefore, it is possible that a number of Jordanian children, who are referred to special education due to learning disabilities, might manifest ADHD symptoms. Lack of knowledge, resources, and skills to identify this population and provide them with appropriate services evoked the efforts to conduct this research study in Jordan.

ADHD is a developmental disorder characterized by inattentive, hyperactive, and impulsive behaviors. It is estimated that the prevalence of this disorder is between 3%-5% of the preschool and elementary school population (Barkley, 1998). Children with ADHD often exhibit high rates of off-task behaviors, have trouble finishing their assignments on time with an adequate level of accuracy, engage in high rates of disruptive behaviors, and often feel isolated (Purdie, Hattie, & Carroll, 2002). Given the numerous responsibilities assumed by teachers in regular education classrooms, having a student with ADHD can cause teachers anxiety as they attempt to meet the needs of all their students. Therefore, designing effective, reliable, and empirically based classroom interventions is critically important to improve the academic performance and social development of young children who manifest ADHD characteristics.

Behavioral Interventions

To date, extensive research has been conducted on the efficacy of various types of interventions to decrease the inattentive behavior of children with ADHD. A primary treatment option is the behavioral approach, which relies on using reinforcement and punishment strategies to increase desirable behavior, and decrease the occurrence of unacceptable behaviors (Purdie et al., 2002). A variety of behavioral

techniques have been used to improve children's attentive behaviors, advance academic performance, and support social behavior. Across behavioral techniques, response cost appears to be one powerful approach for establishing behaviors that are conducive to classroom learning (DuPaul, Guevremont, & Barkley, 1992; Gordon, Thomason, Cooper, & Ivers, 1991; Sullivan & O'Leary, 1990). Response cost involves losing privileges in response to inappropriate behaviors (Fiore, Becker, & Nero, 1993). Interventionists tend to pair positive reinforcement for appropriate behaviors with those that include loss of privileges for the occurrence of inappropriate behaviors. For example, Sullivan and O'Leary compared the effects of response cost and rewards on maintaining high rates of on-task behavior after fading an intervention. Results showed that all 10 children maintained their rates of on-task behavior after fading the response cost, and half of the children continued to do so after the reward system was terminated. In another study, response cost was compared with token reinforcement (McGoey & DuPaul, 2000). Both strategies were effective in reducing disruptive behavior, but teachers had more favorable comments about response cost. Kelly and McCain (1995) compared the utilization of home-school notes with and without response cost to increase academic productivity and appropriate behavior. Findings indicated that home-school notes with response cost were more efficacious than notes without response cost.

Researchers have contrasted the effectiveness of negative and positive consequences on academic performance and on-task behavior. For instance, Pfiffner and O'Leary (1987) assessed the effectiveness of four behavioral conditions on the on-task behavior and academic productivity of 8 elementary children with behavioral and academic problems. The conditions included: regular positive reinforcement, enhanced reinforcement, enhanced reinforcement and reprimand, and enhanced reinforcement after fading the reprimands. The researchers concluded that by using a combination of positive and negative consequences the students' on-task behavior and academic performance incrementally improved, and continued after gradually fading the negative consequences. While the researchers asserted the efficacy of using negative consequences to control inappropriate behaviors, they emphasized the importance of positive consequences to maintain improvement in the target behaviors.

Following the same logic, Kazdin (2001) asserted that rewarding incompatible behaviors could lead to more rapid change in challenging behaviors. Differential Reinforcement of Incompatible Behavior (DRI) involves decreasing the occurrence of undesirable behavior by reinforcing an opposing behavior (Kazdin, 2001). For instance, Lockwood and Bourland (1982) used DRI to decrease finger biting for an

individual with intellectual disabilities by differentially reinforcing sustained toy play.

A series of studies has shown the positive effects of combining response cost with positive techniques on decreasing children's inattentive behavior (DuPaul et al., 1992; McGoey & DuPaul, 2000; Rapport, Murphy, & Bailey, 1982; Sullivan & O'Leary, 1990). However, research findings are limited due to small sample sizes and minimal follow up. Given the research to date, it appears that DRI could be a powerful strategy to use concurrently with response cost. To our knowledge, no study has investigated the use of DRI combined with response cost to increase the attentive behavior of elementary school students.

Solanto (1990) conducted an intervention study with 20 preschoolers with ADHD to investigate the effects of: a) rewards on students' abilities to wait before responding (delayed response) and b) response cost on children's impulsiveness. Findings indicated that there were no statistically significant differences in the effects of rewards and response cost in decreasing children's impulsiveness albeit a slight positive change was observed under the response cost condition. In another study, Carlson, Mann, and Alexander (2000) examined the effects of response cost and rewards on the ability of 40 middle school age students with ADHD to finish assignments and correctly complete problems. Results revealed that response cost was more effective than rewards in improving the students' academic performance. Additionally, "neither reward nor response cost negatively affected self-reported performance perceptions or motivation, or a behavioral measure of intrinsic motivation" (Alexander, 2000, p. 95). The researchers did note that response cost had more of an impact on the students' intrinsic motivation than rewards. The modest results of these two studies suggest a need for additional group design studies to assess the efficacy of response cost and positive reinforcement on motivation and on other problem areas characteristic of ADHD.

Young children with ADHD start to manifest symptoms at an early age, yet they are rarely noticed until they reach elementary school when academic demands increase. Therefore, research is warranted to investigate the use of behavior management strategies with large groups of children in regular education settings. Specifically, response cost, which has proven to be effective in single subject design research, should be further studied. In addition, there is a need for researchers to investigate other behavioral strategies such as DRI, which might compliment response cost.

The current study examined the effects of response cost and DRI on the inattentive behavior of 30 elementary-age children with attention problems in Jordan. The rationale for this combination of

procedures was that together the two interventions could help minimize inattentive behavior and prolong students' attention span, and yet be utilized efficiently by teachers. Each procedure was expected to decrease inattentive behavior, but response cost was hypothesized to be more effective than DRI. A group design was used to investigate the efficacy of the procedures and to assess maintenance of gains. This study attempted to answer the following research questions: (a) are there significant differences between the control and experimental groups in terms of changes in inattentive behavior? and (b) if students in the experimental group display positive changes in attentive behavior, will this progress be maintained after fading the intervention?

Method

Experimental Design

This study used a pretest-posttest control group design (Gay & Airasian, 2000). This design was selected because it provides a combination of random assignment with the presence of a pretest-posttest and comparison group, which serves to control threats to internal validity.

Participants and Setting

Participants were recruited from eight elementary schools with resource rooms that were located in three school districts in Amman, the capital of Jordan. Using an ADHD checklist, the resource room teachers identified 154 third and fourth graders who were at risk for having ADHD. The first author selected the first 60 students, who obtained the highest scores on an ADHD checklist, to participate in this study. None of these children were taking medication. The 60 children were randomly assigned to two cohorts that represented an experimental and a control group. Each group included 30 children from diverse socioeconomic classes. Children in both the experimental and control groups attended private and public schools. The children who attended private schools came from higher socioeconomic classes as tuition was much more expensive than in the public schools. The sample was comprised of 33 boys and 27 girls, between the ages of 8 and 9 years (see Table 1). Parental consent was secured prior to the onset of the study. In sum, the two groups were very similar in terms of grade, gender, and scores on the ADHD checklist.

The intervention was implemented by the 12 special educators who worked in these eight targeted resource rooms. Teachers varied in their educational levels (from two years of college through master degrees in special education), and teaching experiences (range = 3-10 years). All teachers were between 25-33 years of age. After identifying

Table 1
Participant Characteristics

	Boys		Girls	
	3rd grade	4th grade	3rd grade	4th grade
Experimental	9	9	5	7
Control	9	6	6	9

potential schools to participate in the study, the first author secured a formal letter from the district administration urging the principals and teachers to facilitate the research mission in their schools. Next, principals and teachers were approached personally, and told about study goals and procedures. The author pointed out potential gains that teachers and students would attain from participating in this study. All 12 special educators who worked in these eight schools agreed to participate.

The study was conducted in the resource rooms within the eight elementary schools. Typical service delivery was provided to student participants 3-5 times per week using a pull-out model by a special educator. Each resource room was furnished with tables and chairs appropriate to the students' age and physical size. These rooms also contained a variety of instructional materials. Services were delivered to students in two formats: one to one and within small groups. The format and duration of special education services were based on a comprehensive evaluation, which had been conducted by the National Center for Evaluation prior to the students receiving a special education diagnosis.

Dependent Variable

Based on the DSM IV's (American Psychiatric Association, 1994) description of common characteristics related to the inattentive type of ADHD, a checklist of 11 statements was developed in the teachers' home language (see Table 2). A three-point Likert scale was developed (0 = *behavior described in statement never occurs*; 1 = *behavior described in statement rarely occurs*; 2 = *behavior described in statement frequently occurs*) to rate target children. Total scores ranged from 0 to 22, with high scores indicating the presence of more inattentive behavior. The checklist was administered twice by the teachers, one time before intervention and once following the completion of intervention.

The checklist was validated by distributing it to 20 individuals who had experience with children with ADHD. These individuals included professors from special education and counseling, and special

Table 2
Inattentive Symptoms of Children with ADHD

Children with ADHD:	
1.	Fail to pay close attention to details
2.	Have difficulty sustaining attention to tasks or play activities
3.	Do not seem to listen when spoken to directly
4.	Do not follow through on instructions
5.	Fail to finish schoolwork, chores, or duties
6.	Have difficulty organizing tasks and activities
7.	Lose things necessary for tasks or activities (e.g., toys, school assignments, pencils, books)
8.	Are easily distracted by extraneous stimuli
9.	Are forgetful during daily activities
10.	Make careless mistakes in schoolwork or other activities
11.	Avoid, dislike, or are reluctant to engage in tasks that require sustained cognitive effort such as schoolwork or homework

education teachers in Jordan. Feedback from these "experts" focused on the language of the 11 statements, since it was a verbatim translation of the original material. Based on their feedback, the language was modified to reflect the exact meaning, which was conveyed through the statements in their original language. The checklist was returned to the same individuals to ensure that their comments were included as suggested, and to approve the final version of the checklist. Subsequently, 20 children were randomly chosen from resource rooms in 20 schools not targeted for inclusion in this study. The checklist was administered by teachers to these 20 children twice, two weeks apart. Test-retest reliability on the checklist was .84.

Procedures

Pre-intervention. Observational data were collected during the regular routines in the resource rooms. Teachers were asked to continue doing what they usually did in their rooms. The control group remained in this phase throughout the study while the experimental group proceeded through the following phases (see Table 3).

Teacher training. Teachers, who implemented the intervention, received 10 hours of training over two weeks prior to the start to the

Table 3
Study Procedures for the Experimental Group

Pre- intervention	Intervention	Post- intervention	Follow up
Pretest (inattentive section of ADHD checklist)	six weeks of intervention	Posttest (inattentive section of ADHD checklist)	Two weeks after ceasing intervention
Observations to determine the most problematic behaviors (5 sessions at 45 min each)	Fidelity observation		

study. During the first week, teachers were provided with information about ADHD, response cost, DRI, environmental arrangement, and how to conduct the intervention. The following week, the first author conducted individual training sessions to demonstrate the procedures. Strategies such as modeling, role play, feedback, and direct instruction were used during the training sessions. At the end of training, teachers were provided with a vignette that illustrated intervention procedures. They also were provided with guidelines on how to conduct observations and utilize environmental arrangement inside their resource rooms. Teachers in the experimental group implemented the intervention for six weeks.

Introducing the new strategies. The 12 resource room teachers explained to their students that they would begin doing some new things in class to help strengthen their attention skills. Given individual differences in student behaviors, the first author and teachers selected the most severe inattentive behaviors that affected each student's learning. These behaviors were selected using the ADHD checklist previously described. To determine which behaviors interfered with a student's learning, teachers observed each student for five consecutive sessions, 45 minutes for each session, using momentary time sampling. The teachers then created a poster, which contained a list of incompatible behaviors for the chosen inattentive behaviors (e.g., pay attention to the teacher, follow the teacher's instructions, be organized in your assignments, try to finish your assignments on time, go through your answers after you finish, do not forget your materials, listen carefully to directions). These behaviors were stated in a positive way, listed

in an attractive style on a poster using colored markers. The poster was hung on the wall facing the student's seat. The goal of listing the incompatible behaviors on a poster was to provide a visual prompt to keep the student focused during the sessions.

The next step was to organize the classroom environment to support students' attention to the task at hand. For example, teachers were instructed to close the blinds, put extraneous materials out of the student's sight prior to starting a new task (e.g., paper, markers), and cover the closets with curtains so that toys were not visible.

Each intervention session lasted 40 minutes; it was divided into eight 5-minute intervals. The teachers told the students that they would be provided with eight smiley faces per session, and the only way to keep them was by paying attention. Also, students were told that they could earn an extra smiley face each time they sustained their attention during one of the 5-minute intervals (i.e., they could possibly earn 8 extra smiley faces on the top of the 8 points they already earned). The students also were informed that if they lost a smiley face during any interval, they would lose the opportunity to earn an extra smiley face within that same interval.

Prior to intervention, the first author asked student participants to list 15 highly desirable items or rewards. Rewards varied from food reinforcers (e.g., lollipops, gum) to materials (e.g., Pokemon toys, stickers, books). These tangible rewards were not available during the typical school day. At the end of each training session, students counted their smiley faces and exchanged them for reinforcers of their choice. A reward menu was developed listing the value of each reinforcer. For instance, if a student earned 10 smiley faces, at the end of the session, the student would go to the "smiley face table" and see what reinforcer he/she could select for 10 smiley faces. The number of smiley faces that could be earned by a student in a session ranged from 0 to 16.

Intervention package. An intervention package that included: (a) visual prompts (in the form of charts), (b) reduced environmental stimulation, (c) DRI, and (d) response cost was implemented. At the beginning of the intervention phase the teacher hung each student's poster (that included the incompatible behaviors) and arranged the classroom environment to decrease external stimuli. Each student was given eight smiley faces at the beginning of each session. The teacher reminded the student of the desirable and undesirable behaviors. The teacher taught each student as usual based on the student's goals, which were recorded on the individualized educational plan. If a student was not paying attention, he/she would lose one smiley face, would be informed of the reason for the deduction, and would

lose the opportunity to earn an extra smiley face at the end of that interval. If the student did not lose any smiley faces during an interval, the teacher initiated eye contact with the student, praised the student for his/her attentive behaviors, and added an extra smiley face to the student's collection. Losing smiley faces for manifesting inattentive behavior represented the implementation of response cost, while rewarding attentive behavior with extra smiley faces was DRI.

A recording sheet was developed to help the teachers keep track of the smiley faces. The teacher and the student were seated at a table and the smiley face sheet was placed between the teacher and student or small group of students (less than three students). The sheet contained a grid showing the eight intervals with enough space to record the extra smiley faces. At the top of the sheet, eight smiley faces were drawn; the loss of a smiley face was noted by drawing an "X" through it.

Fidelity. Observations to assess fidelity of implementation were conducted throughout the study by two trained graduate students who were blind to the purpose of the study. These observers were trained by the first author to 100% accuracy on written tests and 85 % agreement on observational coding. Observations, using a 6 point fidelity checklist (see Table 4), occurred once weekly throughout the six weeks of the study. Each observation lasted for 40 minutes, and data were collected across the entire observation period. Teachers were provided with feedback on their implementation of the intervention on the days when fidelity measures were taken. Agreement was assessed in 25% of all observational sessions across participants, and the overall mean agreement was 98.5%, with a range from 88.5%-100%. Agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements and then multiplying by 100.

Post intervention. After ceasing intervention, teachers were asked to rate the inattentive behavior of the students using the ADHD checklist.

Follow-up. The teachers rated the students' attention after two weeks of no intervention, using the same checklist. Given time constraints, the first author randomly chose one resource room class session per student and asked the teacher to rate the student's attention during that selected class.

Results

Examination of the adjusted means of the students' scores on the inattention section of the ADHD checklist, prior to intervention, showed no significant differences between the experimental

Table 4
Fidelity Checklist

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1. Teacher reminds the student of the desirable behaviors
 2. Teacher specifies behaviors that are incompatible with inattentive behaviors
 3. Teacher informs the student the reason behind the deduction
 4. Teacher awards or deducts smiley faces based on student attention
 5. Teacher exchanges the smiley faces based on the reward menu
 6. Teacher arranges the classroom environment to support student's on-task behavior
-

and control groups. The mean score for the control group was 17.07, whereas the experimental group mean was 16.63. After implementing the intervention, an ANOVA for efficiency ratio yielded a significant main effect for the experimental group $F(1, 57) = 165.20, p < .0001$, with an effect size 3.1. This indicated that the behavioral intervention had a significant effect in decreasing inattentive behavior (see Table 5). Furthermore, significant differences between the adjusted means of the students' scores on the checklist for the experimental group before and after intervention, and during follow-up showed positive changes in students' attentive behaviors. Means after intervention and for follow-up were 4.6 and 5.3 respectively; the pretest mean was 16.63.

Additionally, using a t test for dependent samples, posttest means were compared to follow-up means to see if participants in the experimental group maintained decreased levels of inattentive behavior $t(1,29) = -2.21, p < .035$ (See Table 6). Results showed that the intervention effect was sustained once treatment was faded. A minimum increase in inattentive behavior was noted.

Table 5
ANOVA Between the Experimental and Control Group Means on the Posttest

Source	<i>df</i>	<i>SS</i>	<i>MSS</i>	<i>F</i>	<i>Cohen's d</i>	<i>p</i>
Source	1	142.62	142.06	11.54		.0001
Groups	1	2033.46	2033.046	165.20	3.1	.0001
Error	57	701.61	12.31			
Total	59	2955.93				

Table 6

t test for Dependent Samples Between Posttest and Follow-up for the Experimental

Group	<i>df</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
Posttest – follow-up	29	-.833	2.069	-2.21	.035

Discussion

The findings from this study indicate the efficacy of response cost paired with DRI on the inattentive behavior for a group of 30 third and fourth grade students. The results indicate that the use of response cost and DRI contingencies were associated with substantial improvement among students in the experimental group. These findings support previous research using single subject designs, which have shown that response cost is more effective in decreasing children's inattentive behavior when it is paired with other strategies (DuPaul et al., 1992; Gordon, Thomason, et al., 1991; Sullivan & O'Leary, 1990)

The current study was conducted in Jordan, where most of the teachers are not fully aware of the characteristics of and recommended practices for working with students with attention problems, such as students with ADHD. Additionally, researchers had not previously investigated the cultural appropriateness of response cost and DRI. These facts amplified the desire to implement this intervention within the cultural context of Jordanian schools. It became evident that implementing response cost and DRI strategies in resource rooms by Jordanian special education teachers, who knew little about behavioral intervention and ADHD, demanded the development of a comprehensive program to educate teachers about the characteristics of ADHD as well as behavioral intervention programs.

An underlying premise was that response cost would be effective in decreasing the inattentive behavior of third and fourth graders. Nevertheless, it was not clear how response cost would operate in combination with DRI, or if DRI would maximize the efficacy of response cost. To obtain successful and systematic implementation of the strategies, and to assess their effects, teachers were exposed to theoretical and practical training. Teachers also were coached on environmental arrangement strategies to assure that the intervention was implemented within a supportive classroom environment. Due to the limited resources and scarcity of in-service training for Jordanian teachers, this research project created an opportunity to train teachers

to be coaches for other professionals and parents within their settings. Providing immediate and constructive feedback to teachers about their performance was crucial to secure the proper implementation of the intervention.

Anecdotal information suggested that teachers became more confident and comfortable in implementing the procedures. Teachers also expressed satisfaction with the intervention, because it provided them with practical methods to improve the attentiveness of their students. Teachers reported that DRI/response cost interventions could be easily implemented with little effort and time. Additionally, the intervention provided the teachers with several skills that would help them in their work inside the classroom (e.g., conducting clinical observations, designing task analyses, and preparing homework in attractive formats).

Drawing attention to the characteristics of ADHD in Jordan might help increase public awareness, evoke problem solving, highlight efforts to work cooperatively toward serving children with ADHD, and stress the importance of intervening early to lessen the potential effects of ADHD on children's social and academic development. Research on ADHD can help focus the attention of professionals, parents, researchers, and others on the negative consequences that this disability can have on children in schools and within the community. The teachers in the current study became more aware of the prevalence and characteristics of ADHD, but there are still many Jordanian professionals who need to be educated about ADHD. Therefore, more intervention research is warranted to improve public awareness as well as provide educators, parents, and other professionals with strategies to use with students who display ADHD characteristics. Although this study was the first of its kind in Jordan, it extends the previous research by investigating the efficacy of combining other strategies (i.e., DRI) with response cost and by using group methodology.

The stability of positive behavior change after fading an intervention is critically important. Follow up results revealed that students in the experimental group retained gains two weeks after fading the intervention. These follow-up results could be explained in two ways. First, the students might have sensed the positive outcomes of the intervention and begun to self-monitor their own behavior more effectively. Teachers reported that students made considerable progress on their academic tasks and social behaviors as a result of the intervention. One teacher noted that the students were reminding each other of the incompatible behaviors, or prompting each other to be more attentive. These comments imply that the students started to become self-driven to prolong their attention span, because the results were tangible and met their interests. On the other hand, it is possible

that DRI succeeded in establishing new behaviors that were beneficial for student learning and social interaction. This pairing of positive and negative strategies is similar to the principle applied in Pfiffner and O'Leary's (1997) research.

There are several limitations to this research such as the lack of social validation data to ensure that gains were significantly apparent to teachers and parents. The results were derived using only one measurement tool, the inattentive section of the ADHD checklist. Therefore, behavioral change was limited to symptoms listed on that checklist, which focused on attention. It should be noted that the researchers did not intend to diagnose participating children or to label them. The lack of culturally appropriate assessment tools in Arabic motivated the first author to utilize available resources to design a checklist for use with children with inattentive behavior. Nevertheless, more work should be done related to the validity and reliability of this checklist before it can be utilized to assess ADHD.

Additionally, the dual role for the teachers was a limitation. Implementing the intervention as well as rating target children's behavior might have encouraged teachers to rate those who participated in the intervention more highly. Also, participating teachers had children from both the control and experimental group on their caseload. This might have interfered with their objectivity in implementation. It should be noted that Jordan is not a diverse country; in general Jordan is a fairly homogenous population although there are socioeconomic differences. Due to reasons related to parents' consent and school regulations, the first author was not able to gather enough information on students' socioeconomic status to conduct further analyses on demographic characteristics.

Although the intervention package reduced the inattentive behaviors of students with ADHD, identifying which facets of the package were most efficacious must still be investigated. Future research also is warranted to study the efficacy of response cost and DRI on other types of behaviors that are characteristic of ADHD. In addition, there is a need to continue using group methodology to study large groups of diverse participants. Researchers should pay attention to the short and long term effects of intervention techniques in school as well as in home and community settings. In the current study, special education teachers were the sole implementers of the intervention. Future research should target parents and general educators as interventionists. Moreover, future research should focus on generalization from school to home or to other settings, and the efficacy of building partnerships between home and school in the provision of services to students with attention problems.

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