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Research Article

The Effectiveness of Applied Behavior Analysis in Developing Academic Skills Among Students With Autism Spectrum Disorder: An Evaluative Study in Morocco

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ABSTRACT

This study aimed to evaluate the academic skills (reading, mathematics, and writing) of students with autism spectrum disorder (ASD) who are benefiting from interventions based on applied behavior analysis (ABA-based) and students with ASD who are not benefiting from ABA-based interventions in Morocco (The cities of Tetouan, M'diq, Fnideq, and Martil). The sample consisted of 112 students (56 in each group) with ASD without intellectual disability. We used Raven's Matrices to measure the level of general non-verbal intelligence, the CARS-2-HF diagnostic test to determine the degree of ASD, and then a skill measurement tool, which is the Assessment of Basic Language and Learning Skills – Revised (The ABLLS-R®), to evaluate the academic skills of students with ASD participating in the study. The results indicated that students with ASD who used ABA-based interventions showed improvement and development in academic skills compared to students who did not use ABA-based interventions. The results showed statistically significant differences between the two groups (reading: $F = 34.188$, $p < .001$; mathematics: $F = 44.308$, $p < .001$; writing: $F = 13.298$, $p < .001$), indicating that the differences are not random, but rather a result of the interventions based on applied behavior analysis. These results may give hope to students with ASD who may develop their academic skills by using ABA-based interventions instead of being integrated into educational institutions without intervention, which leads many of them to not keep up with the curriculum and levels of education.

Keywords: autism spectrum disorder, applied behavior analysis, academic skills, reading, mathematics, writing

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Introduction

Autism spectrum disorder (ASD) is characterized by impairments in social interaction and communication and the presence of restricted and repetitive behaviors (APA, 2013). The average prevalence of ASD in the world now, according to a systematic review of a group of studies published from 2012 to 2021, is about one child per 100 children (Zeidan et al., 2022). The prevalence has increased globally since the 1990s (Zeidan et al., 2022); in the United States (US), it increased from 1 in 150 children born in 1992 (Autism and Developmental Disabilities Monitoring Network Surveillance Year 2000 Principal Investigators & Centers for Disease Control and Prevention, 2007) to 1 in 36 children born in 2012 (Maenner et al., 2023). Academic skills refer to basic reading, writing, and mathematical skills (Dunlap et al., 2001). The ability to read, write, and do math is critical to the intellectual and adaptive functioning of students with ASD, especially with increased attention focused on ensuring that students with ASD are making sufficient academic progress and have access to the general education curriculum (Watkins et al., 2019).

Interventions for individuals with ASD, including behavioral interventions, have often focused on social interaction, communication, self-reliance, and other functional skills, in contrast to academic skills, which have received little attention from researchers (Keen et al., 2015). However, with the introduction of inclusive education for these individuals, their increased access to educational institutions, and attention to ensuring the quality of their education and their ability to keep up with academic education, the interest in interventions that focus on academic skills has increased (Schaefer Whitby, 2013; Watkins et al., 2019).

Applied behavior analysis (ABA) is the application of the science of behavior to address socially important problems. It focuses on observable behaviors and how these are influenced by environmental variables. ABA is used to improve the lives of diverse populations with various concerns; most commonly, it is used to improve developmental and educational outcomes in disabled populations, particularly ASD (Anderson & Hudson, 2022). ABA procedures involve the use of instructional strategies in a systematic, explicit manner to help individuals acquire, maintain, and generalize skills (Cooper et al., 2020). Behavioral interventions focused on academic skills have typically

combined explicit, systematic academic instruction with ABA strategies, such as reinforcement, prompting, modeling, chaining, self-monitoring, and task analysis, to teach new skills and/or correct errors. Such practices have been used effectively across academic content areas with individuals with ASD (Watkins et al., 2022).

ABA, as a practice, is the application of the principles of applied behavior analysis (strategies such as reinforcement, indoctrination, shaping, sequencing, differential reinforcement, etc.), which include a set of interventions such as Early Intensive Behavioral Interventions, discrete trial teaching, pivotal response training, verbal behavior, incidental teaching, behavioral skills training, social skills groups, etc. The effectiveness of interventions based on applied behavior analysis has been recognized by a group of organizations, including Autism Speaks, the United States Surgeon General, the American Psychological Association, the Association for Behavior Analysis International, and the National Institute of Mental Health (Leaf et al., 2021).

In Morocco, inclusive education was recently implemented (school year 2019/2020), allowing Moroccan students with Autism Spectrum Disorder (ASD) to access regular classrooms. While inclusive education itself is a significant achievement, students with ASD face various challenges in acquiring academic skills, as well as in their overall teaching and educational processes. A group of these students benefited (and still benefit) from ABA-based interventions, which helped them overcome academic difficulties. These interventions have benefited students within centers specialized in rehabilitating ASD and within regular classrooms. However, a large share of students with ASD was not included in these interventions. Reasons included the lack of centers providing ABA-based interventions, the lack of specialists in ABA, the holders of the Board Certified Behavior Analyst (BCBA) considering ABA-based interventions as not evidence-based, etc.

The schooling of children with disabilities in general, and those with ASD in particular, has historically been difficult to implement and apply effectively. However, with the efforts of the Ministry of National Education, inclusive education has become a feasible project, as the concept of inclusive education has been activated. Morocco has gone through three stages in the education of children with disabilities, including children with

ASD. The first stage began with special education (starting in 1968), followed by the second stage, which was Integration Education (1994, with the establishment of the first integration department), and the third stage, which is the inclusive education stage. This third stage is based on a set of international laws (e.g., the International Convention on the Rights of the Child, 1993) and national laws (e.g., the Constitution of the Kingdom of Morocco, 2011, Article 34), the strategic vision 2015-2030 (Lever 4), and Framework Law 17-51 (Article 25). Perhaps the greatest contribution to implementing inclusive education is due to Ministerial Resolution No. 047.19, dated June 24, 2019, and Framework Law 51.17, issued in the Official Gazette on August 19, 2019, under No. 6805.

The present study aims to examine the effectiveness of ABA-based interventions in improving academic skills among students with ASD by evaluating the academic skills of students who benefit from ABA-based interventions and those who do not benefit from them. We hypothesize that there will be a statistically significant relationship between engaging in ABA-based interventions for students with ASD and developing reading skills, math skills, and writing skills. Specifically, we expect students with ASD who participate in ABA-based interventions to show improvements in reading, math, and writing skills.

Method

Participants

The sample consisted of two groups of students aged 6-10 years, all diagnosed with ASD (according to DSM-5 criteria) without mental impairment. Each group included 56 students enrolled in either public or private educational institutions at the first, second, or third primary level. The first group used ABA-based interventions, while the second group did not.

The field component was provided to the two groups in the primary educational institutions affiliated with the regional directorate in Tetouan (Moulay Hassan Primary School, Mohammed VI Primary School, Resources and Rehabilitation Hall of the regional directorate in Tetouan, Resources and Rehabilitation Hall of the Technical Development Center in Tetouan) and the regional directorate in M'diq-Fnideq (Qassem Amin Primary School, Omar

Ibn Al-Khattab Primary School, January 11 Primary School), in addition to the centers for ASD (Amal Association for Autistic Children in Fnideq, My Mother Association for ASD and Similar Disorders in M'diq, Hanan Association in Tetouan).

Regarding the equivalence of students in the two groups, it was assessed using Raven's Matrices to measure general non-verbal intelligence and the CARS-2-HF diagnostic test to determine the degree of ASD, including intelligence and autism scores. Additionally, both groups were accepted into educational institutions alongside their peers, with some students studying in the same department. All participants were from the cities of Tetouan and M'diq-Fnideq.

Students who did not use ABA-based interventions received care in centers that do not implement any interventions (i.e., students benefit solely from care without receiving any specific intervention). Inside the school, they receive an education similar to that of their peers, with the added benefit of access to the resource and rehabilitation room, which provides support and review without using any formal intervention.

Measures

The Assessment of Basic Language and Learning Skills–Revised: The ABLLS-R®

The ABLLS-R is an assessment tool, reference guide, and tracking system that measures the language and learning skills of children with developmental disorders, particularly those with ASD (Gabig, 2013). This tool consists of 25 domains and 544 objectives. Applying this assessment requires knowledge of the principles and strategies of ABA (reinforcement, indoctrination, sequencing, shaping, etc.).

The assessment was designed to help families, educators, and specialists identify the level of children's skills in various areas. For this paper, we selected only three out of 25 domains of ABLLS-R. Specifically, we used the tool to assess three academic skills - reading, mathematics, and writing. Previous studies found ABLLS-R to have high internal consistency (i.e., reading: $\alpha = 0.90$, mathematics $\alpha = 0.91$, writing $\alpha = 0.91$) and test-retest

reliability (Partington et al., 2016). Moreover, previous studies suggest satisfactory content validity (Usry et al., 2018).

The total of each of the skills evaluated in this paper includes the following (according to the ABLLS tool): 54 goals and standards in the reading skill, 76 goals and standards in the mathematics skill, and 34 goals and standards in the writing skill. We calculated the acquired goals and standards and used their total for statistical analyses.

Raven's Matrices

The Raven test measures general nonverbal intelligence in individuals aged 5 years and older (Bilker et al., 2012). Since the test was first published (Raven, 1938), it has evolved into a group of well-known versions (Raven, 1989; Raven, Raven, & Court, 1998; Raven, 2000). For this paper, we used the version known as Raven's Advanced Progressive Matrices Review, which contains 36 matrices divided into three groups (A, AB, B), with 12 matrices per group.

The Childhood Autism Rating Scale - Second Edition High-Functioning -

(CARS-2-HF)

The CARS-2 is one of the most important and widely used diagnostic tests for ASD (along with the ADI-R and ADOS-2 tests) due to its diagnostic accuracy and effectiveness in identifying this disorder (Zwaigenbaum & Penner, 2018). The CARS-2 (Schopler et al., 2010) includes three models. The first model is the CARS2-ST test, which is intended for children aged 2 to 6 years who have a clear communication deficit and an IQ lower than 79. The second model, the CARS2-QPC test, is intended for parents or caregivers. The third model, the CARS-2-HF, is intended for children aged 6 years and older who have high functional ability and no communication deficits (Vaughan, 2011). In this study, we used the CARS-2-HF test to determine the degree of ASD.

Procedure

The approval of the Regional Directorate of Education in Tetouan and the Regional Directorate of Education in M'diq-Fnideq was obtained (Reference No.: 403/24), as well as the approval of the rehabilitation centers

for individuals with ASD (associations). The three instruments were administered in schools affiliated with the two regional directorates and in the centers where these individuals benefit. In addition, informed consent was obtained from the parents of all students with ASD.

We based the inclusion and exclusion criteria on the following conditions: 1) excluding participants who had a concomitant mental disability (according to a medical certificate) or who had a below-average performance in IQ (measured by the Raven Matrix), 2) excluding cases that recorded a severe level of autism (measured by the CARS-2-HF), 3) excluding non-speaking participants, 4) excluding participants who were over 10 years old, 5) excluding participants who were pursuing their studies at the fourth primary level or above, 6) excluding participants who suffered from violent or aggressive behaviors.

All participants were tested and evaluated individually in a room either at the school or the centers. The experimenter initially engaged the students in conversations on general topics of interest to them in order to establish a good relationship. This was done with the help of the teacher for the students evaluated at school and the special education specialist for those evaluated at the centers. The lack of pre-measurement of exposure to applied behavior analysis is primarily due to the fact that beneficiaries of these interventions differed in the duration of their benefits. Specifically, their benefits in private centers ranged from 6 months to 4 years (4 hours per week for 10 months per year). In contrast, other students did not benefit from ABA interventions, leading to differences in their development of academic skills, as noted in the current study.

Data analysis

All statistical analyses were performed using IBM SPSS Statistics for Windows, version 26. We computed descriptive statistics (i.e., minimum, maximum, mean, and standard deviation) to gain initial insight into the number of acquired objectives and standards for each group. We used the Pearson correlation coefficient to measure the correlation between three variables (reading, mathematics, and writing). We then used a multiple analysis of variance (MANOVA) to compare the differences between the study variables (reading, mathematics, and writing) in terms of the number of

goals achieved by the group of students with ASD who benefit from ABA-based interventions and the group of students with ASD who do not benefit from ABA-based interventions.

Results

As shown in Table 1, reading, math, and writing scores were, on average, higher in students with ASD who engaged in ABA-based interventions compared to those who did not.

Table 1

Descriptive Statistics for the Two Groups

Measure	Group ASD (ABA-based interventions)				Group ASD (no ABA-based interventions)			
	Min	Max	*M*	*SD*	Min	Max	*M*	*SD*
Reading	6.00	54.00	44.14	13.78	1.00	54.00	26.50	17.28
Math	3.00	76.00	57.26	20.72	1.00	67.00	28.44	24.90
Writing	2.00	34.00	31.17	7.77	2.00	34.00	24.35	11.64

Specifically, the difference between the groups in reading performance was significant ($F(1,110) = 34.18$, $p < .001$). Similarly, significant differences were found in mathematics scores ($F(1,110) = 44.30$, $p < .001$) and writing ($F(1,110) = 13.29$, $p < .001$). These Results suggest that group membership had a significant and meaningful impact on academic skills across all three areas, with the strongest group effect observed in mathematics, followed by reading and then writing (see Table 2).

Table 2

Between-group Differences in Reading, Mathematics, and Writing

Source	Variable	Sum of Squares	*df*	Medium square	*F*	*p-value*	Partial η^2
group	Reading	8400.893	1	8400.893	34.188	$p < .001$	0.237
	Math	23258.893	1	23258.893	44.308	$p < .001$	0.287
	Writing	1302.893	1	1302.893	13.298	$p < .001$	0.108
error	Reading	27030.214	110	245.729			
	Math	57742.821	110	524.935			
	Writing	10777.071	110	97.973			
Total corrected	Reading	35431.107	111				
	Math	81001.714	111				
	Writing	12079.964	111				

Discussion

In Morocco, inclusive education started in the 2019/2020 school year. The present study is the first study in Morocco to evaluate the effectiveness of ABA-based interventions in developing the academic skills of students with ASD, comparing those who benefit from these interventions to those who do not. To examine the effectiveness of ABA-based interventions, the current study evaluated the academic skills of students who benefited from them and those who did not.

Our results have shown that the ABA-based interventions group scored higher on all three measures (i.e., reading, writing, math) than the group who did not benefit from such interventions. Such results suggest that ABA-based interventions may be effective in developing and improving the academic skills of students with ASD.

A number of previous studies have demonstrated the effectiveness of ABA-based interventions through the use of a range of strategies. In a study of 3 children with ASD learning to identify and label novel letters (Arabic and Greek) using a video modeling strategy, the three participants were able to master identifying and naming the target letters through self-modeling (Marcus & Wilder, 2009). A study indicated the effectiveness of the Discrete Trial Training (DTT) intervention in teaching word recognition skills to students with ASD (Kamps et al., 1990). A study used stimulus superimposition and

fading strategies to teach sight-word reading skills to a 6-year-old student with ASD. The experiment found that these strategies were effective, as the student was able to read 14 out of 15 words (Birkan et al., 2007). In another study, to generalize sight word reading skill to 6 participants with ASD, aged 5 to 8 years, using a time delay strategy, the experiment confirmed that the participants learned the target words, indicating the effectiveness of the time delay behavioral procedure (Ledford et al., 2008).

Reading comprehension is more complex than reading letters and words, as it requires a set of characteristics, such as processing the text and understanding its meaning, in addition to integrating the text with previously acquired knowledge (Singh et al., 2020). A number of studies have focused on effective behavioral interventions for teaching reading comprehension. One effective intervention for reading comprehension for individuals with ASD is direct instruction - an educational intervention that falls within the ABA-based interventions. It refers to an organized and systematic educational approach under the supervision of the teacher, whose role is to build skills in a sequential and cumulative manner (Watkins et al., 2022). This approach uses assistance to elicit correct student responses and break down complex skills into component parts (Finnegan & Mazin, 2016).

One previous study that used direct instruction to teach reading comprehension skills to students with ASD has found a functional relationship between direct instruction and participants' reading comprehension skills (Flores & Ganz, 2007). In a study of 11 students with ASD using direct instruction similar to the previous study to teach reading comprehension, the results found statistically significant differences in learners' reading comprehension skills over time (Flores et al., 2013). In a comparative study using two reading comprehension interventions (i.e., teacher-directed instruction and iPad®-assisted instruction) on three elementary students with ASD , the results revealed the effectiveness of both interventions in reading comprehension skill, but the teacher-directed instruction intervention was more effective in increasing response accuracy for reading comprehension (El Zein et al., 2015). Another study indicated the effectiveness of direct instruction on the comprehension of science texts for three secondary school students with ASD (Carnahan et al., 2016).

A number of studies have shown variation in the level of students with ASD in mathematics skills, and some studies have indicated the possibility of the existence of special strengths in individuals with ASD in mathematics skills (Baron-Cohen et al., 2007). Other studies have reported that individuals with ASD, on average, have average mathematics-related skills (Titeca et al., 2014), and that about a quarter of individuals with ASD have difficulty learning mathematics skills (Donaldson & Zager, 2010). Most studies of mathematics skills in individuals with ASD have focused on number and arithmetic skills (Alresheed et al., 2018). ABA strategies used in teaching mathematics skills include: reinforcement, task analysis, video modeling, and time delay (Watkins et al., 2022).

A number of reviews have examined interventions researchers have used to teach mathematics to individuals with ASD, which have included applied behavioral interventions or the integration of these strategies into intervention packages (Gevarter et al., 2016; Ehsan et al., 2018). One study compared two ABA strategies, no-no prompting and simultaneous prompting, to teach mathematics to three children with ASD. The results indicated that the no-no prompting strategy was more effective than the simultaneous prompting strategy (Leaf et al., 2010).

Another study examined the teaching of a mathematics skill (computation of sales tax) in addition to a set of other skills to three students, including a student with ASD, using a time delay strategy. The study found that this strategy was effective in acquiring and maintaining skills, in addition to generalizing them (Collins et al., 2011). A study found that a package of behavioral interventions that included video modeling (based on the iPad), gradual fading, reinforcement, prompts and forward chaining were effective in acquiring basic arithmetic skills (identifying and writing numbers from 1-7 and understanding the quantity each number represents) for a child with ASD (Jowett et al., 2012). Another study demonstrated a functional relationship between video self-modeling and mathematics skill (mathematical problem) in three students with ASD (Burton et al., 2013). A study demonstrated the effectiveness of a video modeling strategy in solving word problems involving subtracting mixed fractions with unfamiliar denominators in three high school students with ASD (Yakubova et al., 2015). A study confirmed the positive effect of a visual support strategy on solving equations, as high-

functioning student with ASD was able to solve algebraic equations with this intervention (Barnett & Cleary, 2019).

In writing, a set of ABA-based interventions were used to teach functional and academic handwriting skills to individuals with ASD (Pennington & Carpenter, 2019). A study used video modeling, token economy, reinforcement, and backward chaining strategies to teach a child to write her full name, and the results found that the intervention was acceptable (Moore et al., 2013). Another study, involving three participants, including two with ASD (a 7-year-old female and a 12-year-old male), evaluated the effects of a response prompting strategy (constant time delay, system of least prompts) on sentence writing, and the results indicated that the intervention package was effective for all participants in sentence writing (Pennington et al., 2016). A study used a package of interventions including modeling, self-monitoring, and feedback to improve letter writing skills in three participants, including one with ASD, and all participants were able to improve their letter writing skills (Pennington et al., 2014).

A group of students face difficulty in acquiring academic skills, due to a set of factors that include; difficulties in memory, comprehension, attention, and social behavior (Ledbetter-Cho et al., 2020). In addition, students with below-average IQs face difficulty in keeping up with academic skills, which affects their academic future and shows a delay in this area compared to their peers (Keen et al., 2015). In this context, many students with ASD need intervention to develop their academic skills to continue to keep up with all levels of education. A set of interventions has shown an improvement in academic skills in these individuals, in addition to the emergence of long-term and significant results in academic skills due to these interventions that these learners received (Ledbetter-Cho et al., 2020).

It has been difficult to identify effective interventions for students with ASD. This is due to the relatively limited research in this area compared to interventions targeting social interaction, communication, and other functional behaviors. Researchers have had difficulty identifying interventions that are effective and improve academic skills for individuals with ASD (Watkins et al., 2022). Dunlap et al. (2001) suggested that ABA may be effective for individuals with ASD in the area of academic skills. They identified a set of indicators that make ABA particularly appropriate for

academic instruction, focusing on tailoring intervention strategies to the specific needs of each individual, emphasizing an emphasis on experimentation, direct observation of outcomes, and documentation of effective and replicable instructional practices and procedures (Dunlap et al., 2001).

In a comprehensive review of strategies used in content area instruction for students with ASD, which focused primarily on academic skills (reading, writing, and mathematics), a range of effective interventions were found, including a) visual supports; (b) technology-based instruction (e.g., computer-assisted instruction, video modeling); (c) concrete representation; (d) direct instruction; and (e) behavioral interventions (e.g., time delay) (Spencer et al., 2014). The review by Spencer et al. (2014) supports our Results regarding the effectiveness of ABA interventions in academic skills, as most of the interventions discussed by Spencer et al. (2014) belong to ABA, such as a) visual supports; (b) technology-based instruction (e.g., computer-assisted instruction, video modeling); direct instruction; and behavioral interventions (e.g., time delay). A number of recent literature reviews have examined several studies that have addressed academic skills interventions for individuals with ASD, which include ABA-based interventions and other interventions (Alresheed et al., 2018; Tárraga-Mínguez et al., 2020).

Fleury et al. (2014) found that a range of ABA practices—including task analysis, direct instruction, response prompting procedures, visual supports, modeling, and time delay—are associated with the development and improvement of academic skills for high school students with ASD. Additionally, a review identified 25 interventions aimed at enhancing academic skills and/or school readiness, which included various ABA practices and strategies, such as direct instruction, discrete trial training, extinction, modeling, prompting, reinforcement, task analysis, time delay, and video modeling (Steinbrenner et al., 2020).

Through our study, along with a group of studies we have discussed, including the studies by Spencer et al. (2014) and Fleury et al. (2014), it becomes clear that ABA-based interventions are effective, especially when using some of the strategies and interventions (e.g., direct instruction, time delay, video modeling…) mentioned in our research.

In general, intervention strategies based on the principles of ABA are effective at targeting academic outcomes for individuals with ASD (Gevarter et al., 2016). There is an increased emphasis on specific academic interventions for learners with ASD in the literature, especially given the positive outcomes associated with improved academic performance and the need to develop effective, replicable procedures to target academic outcomes (Teacher-implemented video-schedule intervention; Ledbetter-Cho et al., 2020). Additionally, the incorporation of behavioral procedures into academic instruction may produce more robust results than interventions that do not utilize behavioral strategies (e.g., Solis et al., 2016). Many studies have also used ABA strategies within a technology framework to teach academic skills (Ledbetter-Cho et al., 2018; Root et al., 2017).

This study may help guide families toward the benefits of ABA-based interventions for their children, potentially improving their academic performance in reading, math, and writing. It also aims to encourage centers to adopt applied behavior analysis as an evidence-based practice, providing effective services to beneficiaries and training their staff in these interventions. Furthermore, the Moroccan government, through its Ministry of National Education, is encouraged to offer support to schools in implementing these interventions within regular classrooms. This can be achieved through various strategies, such as reinforcement, behavior contracts, token economies, and prompting, to enhance and develop the academic skills of students with ASD.

Limitations and future directions

Although the study results suggest the effectiveness of applied behavior analysis (ABA)-based interventions by comparing students with autism spectrum disorder (ASD) who benefit from these interventions with those who do not, several limitations must be acknowledged. First, the study focused exclusively on students diagnosed with ASD, making it difficult to generalize the results to other neurodevelopmental disorders. Additionally, the participants were aged 6 to 10 years, restricting the applicability of the findings to other age groups. second, the study did not compare ABA-based interventions with alternative interventions (e.g., cognitive interventions), leaving it unclear whether other methods might yield similar outcomes.

Limitations highlight the need for future research in this area of academic skill achievement for elementary, middle, and high school students with ASD. Future research with larger sample sizes is necessary to enhance the generalizability of results. Further research is needed to continue examining additional ways to use ABA-based interventions to improve procedural and conceptual academic skills for students with ASD. Maintenance is particularly important because academic skills develop from the mastery of prior skills. Mastery of basic academic skills allows students with ASD to focus on more complex problems in the future and generalize skills.

Conclusion

In summary, the current study examined the effectiveness of applied behavior analysis (ABA)-based interventions by assessing the academic skills of students who benefited from these interventions and those who did not. The results indicated that students who benefited from ABA interventions performed higher in academic skills than students who did not. The results of this study contribute to emerging trends supporting ABA interventions for students with autism spectrum disorder (ASD) and expanding the scope of teaching academic skills. Several previous studies have demonstrated that ABA-based interventions can be considered evidence-based practices in academic settings, but further research is needed to address the academic needs of students with ASD.

Conflict of interest

We have no conflicts of interest to disclose.

Data availability statement

Data used in this paper are available upon a reasonable request.

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