

BRIDGING LITERACY GAPS: A BEHAVIOR-BASED INTERVENTION FOR A CHILD WITH DOWN SYNDROME

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DOI: <https://doi.org/10.5281/zenodo.17060708>

Keywords

Academic Readiness, Behavioral Modification, Intellectual Developmental Disorder, Down Syndrome

Article History

Received: 11 June 2025

Accepted: 21 August 2025

Published: 05 September 2025

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Abstract

Intellectual Developmental Disorder (IDD) is a neurodevelopmental disorder characterized by deficits in intellectual functioning and adaptive behavior that appear during the developmental period. As per the DSM-5-TR, IDD has different severity level across conceptual, social, and practical domains (American Psychiatric Association, 2022). Children with IDD and Down Syndrome typically display significant challenges in the conceptual area, including academic learning, memory, language, and problem-solving difficulties (Schalock et al., 2021). Such delays prevent them from developing foundational academic skills like recognizing shapes, writing their name, having fine motor skills, and beginning numeracy. A 13-year-old boy was referred for psychological intervention. This case study investigated a three-month intervention, administered three times weekly the intervention produced strong improvements in task independence and classroom behavior. These results demonstrate the efficacy of closely structured, individualized behavioral interventions for enhancing academic readiness in children with developmental disabilities. Following the guidelines of behavioral modification like modelling, task analysis, prompting, positive reinforcement, and visual supports, a personalized intervention plan was developed to minimize these academics problems (Cooper, Heron, & Heward, 2020). The intent of this research is to show the worth of utilizing scheduled behavioral modification techniques to enhance learning skills among children with Down syndrome and IDD.

INTRODUCTION

Case Presentation

The 13-year-old boy lived in a nuclear family type with his mother and four elder siblings. The family belonged to a lower socioeconomic status. He attended a government special school and was referred by his teacher because of some issues regarding his work at school. These impairments significantly affected his involvement in academics and daily functional autonomy. The infant was

delivered by cesarean and had a late cry during birth. Early developmental delays were noticed, such as delay in sitting, walking, head control, and speech. The issues were not attended to early on, as per his mother, because he was ignorant and of limited education. There was a known family history of intellectual disability on both maternal and paternal sides. He was first placed in a regular school but, having struggled with school work, was later

transferred to a special school when he was 10 years old.

The observations were conducted in varying environments, such as within the classroom, at playtime, and at lunchtime. The child was physically healthy and showed facial features associated with Down syndrome, including a flat face, upwardly sloping eye openings, and a short neck. His grooming and personal hygiene were ensured daily. In classroom environments, he sustained well-formed routines and obeyed commands. He did coloring and tracing letters and exhibited good sitting conduct. At lunch, he ate his meal by himself and cleaned the table afterwards. At recess, when he tried to play with others, his gross motor challenges restricted him from playing active games. These were indicators of strengths in compliance with behavior and independent living skills but also of challenges with physical coordination.

When doing tasks academically, the child was frequently having trouble recognizing shapes, demonstrating difficulty differentiating known geometric shapes. He required repeated reminding and visual assistance to perform matching and sorting tasks. When writing his name, he used tracing and needed ongoing support to properly shape the letters. Cutting was compromised by lack of fine motor control, and he required support in keeping direction while cutting with scissors. During coin recognition tasks, the child could not sort out between denominations, indicative of a limited number sense. The main academic objectives were to reinforce his thinking abilities on a consistent basis, establish fundamental skills in visual discrimination, polish fine motor precision, and increase functional knowledge of everyday symbols such as coins. A clinical interview with the teacher corroborated these educational issues. The teacher rated these issues on a perceived severity rating scale as follows: no shape identification (9/10), unable to write name (10/10), unable to cut with scissors (8/10), and no money recognition (9/10).

Standardized tests applied were the Portage Guide to Early Education (PGEE) (Bluma et al., 1976) and the Child Adaptive Behavior Scale (CABS) (Lambie & Bond, 1986), both of which indicated significant delays in school and adaptive abilities. For diagnostic validation purposes, the DSM-5-TR criteria (APA, 2022) were used in a structured checklist manner, validating Mild Intellectual Developmental Disorder diagnosis with total conceptual deficits (i.e., learning, reasoning, problem-solving).

An individualized academic intervention plan was developed and implemented with institutional approval. Evidence-based strategies such as modeling, task analysis, verbal cues, visual supports, and positive reinforcement were used. The intervention was successful in four areas of academic skill that are vital: identification of shape, writing names, use of scissors, and recognition of coins using systematic, research-based procedures. In shape recognition, the child progressed from requiring total prompts to identifying simple shapes like circles and squares with only verbal prompts supplemented by visual cues and feedback. In writing names, touch work and tracing capital letters were married to consistent increases of progressive development, with the child growing more independent through shaping, decreasing prompt fading, and simplifying the task. His cutting ability was paired with sticker tasks and guided tracing; with practice, he demonstrated improved control and precision in cutting a curvilinear line. Coin recognition, matching, and sorting activities along with the reinforcement exercises facilitated the child more and more to distinguish between the known denominations. In all the objectives, modeling, reinforcement, prompting, and fading were primary strategies in ensuring independence and skill development. This step-by-step strategy allowed the child to progress meaningfully in accordance with his level of development. Feedback from both the teacher and the mother reflected increased independence, classroom engagement, and confidence in performing academic tasks.

Table 1: Goals, Assessment Findings, and Intervention Outcomes

No	Goals	Assessment Findings	Management Outcomes
1	Shape Recognition (circle, square, triangle, rectangle)	Unable to identify or differentiate basic shapes	Accurately identified shapes in 4/5 trials with verbal prompting

2	Writing Full Name	Unable to trace or write own name; required hand-over-hand support	Able to trace and write name with minimal assistance in 3/5 trials
3	Cutting with Scissors	Poor fine motor control; unable to cut straight or curved lines	Able to cut shapes with partial assistance and visual guidance
4	Coin Recognition	Unable to differentiate coins; no understanding of value	Matched coins accurately using money box and flashcards

Discussion

The purpose of this case study was to demonstrate the effectiveness of behavior modification techniques in enhancing basic academic skills in a child with developmental delay aged 13. The child was having excessive difficulty in identifying simple shapes, writing his name, cutting with scissors, and recognizing coins skills that are necessary for early academic achievement and functional autonomy. Prior to intervention, the case was conceptualized based on the 4Ps model. Predisposing conditions were genetic susceptibility, chromosomal abnormalities, and late cry at birth (Haddad et al., 2016; Sheldrick et al., 2019). Contributing conditions included early developmental delay, medical complications, and short duration of exposure to educational stimulation. Maintaining factors were linked to inconsistent teaching methods and irregular school attendance. Protective factors included strong family support, school enrollment, and regular participation in intervention sessions. The intervention was based on evidence-based behavioral strategies such as modeling, shaping, cueing, fading, and positive reinforcement (Cooper, Heron, & Heward, 2020; Miltenberger, 2016). These approaches are supported by existing literature on improving academic skill development in children with intellectual and developmental disabilities (Brady et al., 2022; Leko et al., 2021). After implementation, the child showed measurable improvement in all of the skill areas targeted. He started identifying simple shapes with reduced prompting, moved from tracing letters to writing his name with more independence, improved control in the use of scissors, and showed mastery in coin recognition through structured tasks. These results are consistent with research that outlines the contribution of prolonged reinforcement and systematic support reduction in allowing the

acquisition and generalization of skills in children with IDD (Case-Smith & O'Brien, 2015; Kostelnik et al., 2015). Post-intervention teacher reports indicated improved classroom participation, reduced dependence upon cues, and elevated levels of academic independence. Overall, findings support the utility of individualized, behaviorally based instructional programs in securing academic achievement of substance when delivered within a strong and supportive school environment.

Conclusion

This case study showed how behaviorally based instructional interventions can help a 13-year-old with developmental disabilities gain early learning skills. At first, the child clearly struggled to identify shapes, write names, cut, and recognize currencies. Incremental development was observed in all targeted academic areas with the use of systematized behavioral techniques, such as modeling, prompting, shaping, fading, and positive reinforcement. Developmentally appropriate, task-reduced activities that supported the child's fine motor skills and conceptual growth were used to address each goal. Teacher evaluations of the intervention's results indicated increased task independence and engagement in class. While the outcomes are promising, the single-case design limits generalizability. Future research should explore the long-term impact of such interventions across larger samples and examine the generalization of learned skills to new settings and contexts. Overall, the study highlights the importance of early, stable, and ecologically sound support networks in fostering long-term academic success and validates the effectiveness of tailored, behaviorally based teaching strategies in addressing academic skill deficiencies in students with Down syndrome and intellectual developmental disorders.

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