

# The Effects of Interventions on Behavior Outcomes for Children with Speech and Language Delays: A Scoping Review

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## Abstract

This scoping review synthesized research on interventions targeting behavior outcomes for preschool and primary-grade students with speech and language delays. The review aimed to inform research and practice on managing children's behavior problems. A comprehensive search of databases and gray literature was conducted. Studies were included if they: a) included students ages 3 - 8 years with speech/language delays, b) assessed a speech/language or behavioral intervention, c) measured behavioral outcomes, and d) used an experimental or quasi-experimental design. Thirteen studies met inclusion criteria (N = 1304 participants). Interventions targeting speech/language, behavior, and social communication skills were commonly used (n = 8 studies). Positive behavior changes were reported across studies, frequently coinciding with speech/language gains. Findings provide preliminary support for using interventions that integrate speech/language, behavioral, and social communication components to improve behaviors of young students with language disorders. Additional rigorous research is needed to establish more conclusive evidence.

## Keywords

Speech Delay, Language Delay, Challenging Behavior, Early Intervention, Scoping Review

## 1. Introduction

In education, language is the basis for academic and behavioral achievement (Chow & Webby, 2019). Speech is described as the verbalization of language and language is defined as the conceptual mechanism of communication. Whereas receptive language involves the process of understanding spoken and written

language, expressive language is defined as the ability to communicate feelings, thoughts, and information or ideas (McLaughlin, 2011). The *Individuals with Disabilities Education Act (IDEA) (2004)* defines speech and language delays as a communication disorder that includes stuttering, impaired articulation, language impairment, or speech impairment. In 2012, speech and language delays had a prevalence of 5% and 3.3% in children between the ages of three and 17 years of age in the United States (Black et al., 2015). Children with speech and language delays face difficulties in conveying their thoughts and emotions to their parents, teacher, and peers. Communication difficulties lead them to experience complex emotions such as frustration, agitation, and emotional regulation deficiencies (Torre & Lieberman, 2018; Rieffe & Wiefferink, 2017).

Speech and language delays affect communication skills and behavior. Numerous studies investigated the association and correlation of speech and language delays and the manifestation of challenging behaviors. For instance, Roberts et al. (2018) found that challenging behavior and speech and language delays co-occur and exhibit a nonlinear correlation, i.e., improvements in speech and language consequently reduce challenging behavior. McLaughlin (2011) described that speech and language delays significantly impact children's academic accomplishments and communication skills. A meta-analysis study conducted by Curtis et al. (2018) showed that, in comparison to typically developing peers, children with language disabilities have a higher occurrence of challenging behavior. Thus, the language ability of children with speech and language delays predicts the presence of problem behaviors; however, problem behaviors do not predict their language ability (Petersen et al., 2013).

This paper synthesizes the literature that examined behavior outcomes for students with speech and language delays between the ages of three and eight years of age. The aim of the review is to help researchers and practitioners better understand and manage children's problem behaviors by identifying and evaluating successful strategies for promoting and enhancing behavior. This scoping review included three research questions: 1) What types of interventions are commonly used to improve the behavior of children with speech and language delays? 2) What are shared components/features used across interventions to improve the behavior of children with speech and language delays? 3) What are the behavioral outcomes of interventions for children with speech and language delays?

## 2. Method

### 2.1. Search Strategy

In searching for articles for this scoping review, an electronic search was conducted on Google Scholar and EBSCO, which included nine relevant databases (e.g., Academic Search Complete, Education Research Complete, Education Full Text (H.W. Wilson), ERIC, Psychology Behavioral Sciences Collection, Linguistics Abstracts Online, Communication & Mass Media Complete, Communication Source, and APA PsycArticles). Filters were applied to limit the search to

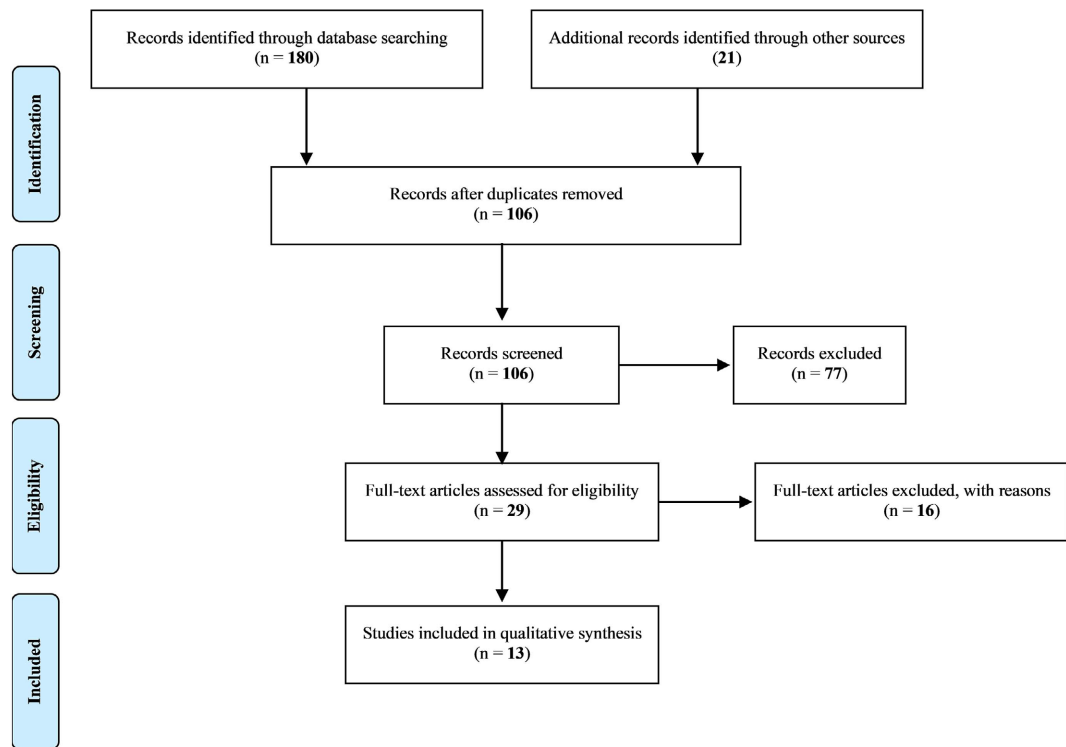
articles published between 1975 and 2021 because it was not until 1975 that speech and language services were commonly offered in schools as mandated by the Public Law 94-142 Education Act. The following search terms were applied: “Speech Delay\*” OR “language skill\*” OR “language delay\*” “stutter\*” OR “impairment articulation” OR “language impairment” OR “speech impairment” OR “disability” OR “phonology disorder” OR “voice disorder” OR “SLI” OR “Specific language impairment” AND “challeng\* behavior\*” OR “disruptive behavior\*” OR “behavior disorder\*” OR “Behavior problem” OR “emotional\* behavior\*” AND “preschool\*” OR “kindergarten\*” OR “prek\*” OR “pre-k\*” OR “daycare\*” OR “primary ed\*” OR “primary school” OR “grade 1\*” OR “grade 2\*” OR “first grade” OR “second grade” OR “grade one” OR “grade two” OR “Elementary” OR “primary” OR “year 1” OR “year 2” OR “year 3” AND “speech therapy” OR “intervention\*” OR “language intervention\*” OR “speech intervention.”

## 2.2. Inclusion and Exclusion Criteria

The initial search identified 106 studies for initial screening after removing the duplicated research from EBSCO (180) and Google Scholar (21). The initial screening involved reviewing the articles’ title and abstract in accordance with the following inclusion criteria: 1) the study must be published in English; 2) the study must be published between 1975 to 2021; 3) the study must be described in an academic article published in peer-reviewed journals; 4) the study must include participants with speech and language delays exhibiting challenging behavior; 5) the study must include either speech and language delay or challenging behavior interventions; 6) participants must be in preschool to second grade (ages 3 to 8); 7) the study design must be a randomized controlled trial (RCT) or quasi-experimental design (QED) or single-subject experimental designs, and 8) the study must report at least one behavioral outcome measure. Studies were excluded if they included participants with severe to profound intellectual disabilities. In ensuring the reliability of screening procedures, two raters conducted independent screening of title and abstracts of the 106 identified studies. The study selection process is depicted using a flow diagram in **Figure 1**.

## 2.3. Selection Process

The primary investigator screened and coded all the studies, and a second-rater double-coded the original code-sheet to any detect discrepancies. The initial screening that resulted in a reliability of 89.62%, as there were discrepancies found in 11 studies (10.37%). Consequently, the raters discussed the 11 studies and ultimately five articles of those studies were included for further inspection. The initial search resulted in selecting 29 studies (27.35%) for a more in-depth review. The full text of the remaining 29 articles was comprehensively reviewed. The final review excluded 16 studies (87.73%), resulting in 13 studies (12.26%) being included in the scoping review. As previously mentioned, the initial



**Figure 1.** Flow diagram of study selection process.

inter-rater reliability yielded 89.62%; however, after discussion the inter-rater reliability was 100%.

#### 2.4. Data Collection

The researchers extracted data from the 13 included studies to describe the studies and evaluate the quality of the research. Information extracted from the articles included: participant characteristics (age, gender, race, and sample size), study design, a description of the intervention (sessions, group size per session, settings, and context), the interventionist, outcomes measured (e.g., speech and language, challenging behavior) and their assessment tools, validity and reliability of measures, and treatment implementation fidelity.

#### 2.5. Data Analysis and Quality Indicators

The studies were summarized in tabular form to describe them in terms of research design participants, and other key features which included the type of the intervention, interventionist, outcome domains, and outcome measures. The researchers evaluated the quality of the included 13 studies based on the quality indicators of Council for Exceptional Children standards for evidence-based practices in special education (CEC, 2014) and What Works Clearinghouse (WWC) evidence-based practice recommendations. This evaluation focused on the studies' applied procedures and analyses. The researchers evaluated the research using WWC recommendations involving the outcome measures assessment (i.e., validity, reliability, the use of consistent data collection procedures,

and application of standardized tests and assessment instruments). Furthermore, the researchers applied its standards to evaluate the studies based on group comparison and single-case research design quality indicator matrix. The CEC quality indicators are: a) context and setting, b) participants, c) intervention agent, d) description of practice, e) implementation fidelity, f) internal validity, g) outcome measures/dependent variables, and h) data analysis. Included studies were rated on the methodological soundness of a study. Examining these features is critical as they demonstrate the feasibility of application in different environments. The researchers rate these studies using the supplied CEC rating method, quality indicator matrix, after using the standards overview and walk-through guide (Lane et al., 2014; Royer et al., 2017). The applied rating scheme was 0 = not meeting the quality indicator and 1 = meeting the quality indicator. According to the CEC, a sound methodology is an absolute (100%) by meeting all the quality indicators or weighted coding scheme that meets most of the quality indicators (more or equal to 80%). The two raters independently carried out the evaluation, as the primary investigator evaluated the 13 studies using and WWC and CE, the second-rater double-evaluated the original quality indicator matrix-sheet to detect any discrepancies. The initial inter-rater reliability was 92% and after discussion the inter-rater reliability was 100%.

### 3. Results

This systemic review performed an extensive search of the literature to identify interventional studies that examined behavior outcomes for students with speech and language delays, specifically students aged three and eight. Results from studies were overall positive. The behavior of children and their interaction with others improved. Furthermore, their speech and language skills developed, and thus their overall academic achievements as well. **Table 1** presents a summary of the 13 studies that were included in this review.

**Table 1.** Summary of studies.

Study	Design	Participants	Type of Intervention	Interventionist
Bulotsky Shearer et al., 2020	Experimental	304 children, aged 3 - 5 years	Teacher-child interaction quality	Teacher
Chao et al., 2006	RCT	41 children, aged 3 - 6 years	Family-centered intervention	Parent-professional
Craig-Unkefer & Kaiser, 2002	Single subject	6 children, aged 3 - 4 years	Peer play intervention	Interventionist
Delaney & Kaiser, 2001	Single subject	4 children, aged 3 years	Parent training	Parent-professional
Girolametto et al., 1995	RCT pilot	16 children, aged 2 - 3 years	Hanen parent training	Parent-professional
Hancock et al., 2002	Single subject	5 children, aged 3 - 4 years	Parent training	Parent-professional
Jones et al., 2013	RCT	467 children, aged 2 - 6 years	Teacher-child relationship intervention	Teacher

**Continued**

Justice et al., 2017	QED	272 children, aged 5 - 7 years	Intensive speech therapy	SLP
McIntosh & Dodd, 2008	Single subject	3 children, aged 4 - 5 years	Core vocabulary intervention	Clinician
O'Reilly et al., 2008	Single subject	2 children, aged 5 - 7 years	Social skills training	Therapist-teacher
Schneider & Goldstein, 2009	Single subject	3 children, aged 6 - 9 years	Social stories intervention	Interventionist
Stanton-Chapman & Brown, 2015	Single subject	6 children, aged 3 years	Storybook reading	Interventionist
Van Craeyevelt et al., 2017	RCT	175 children, aged 4 years	Teacher-child play sessions	Teacher-consultant

**3.1. Participants and Settings**

Collectively, the studies included in this review included a total of 1304 participants. Most of the participants were males (i.e., 771 males and 532 females). Among these studies, three articles included child-parent dyads (23%) (Delaney & Kaiser, 2001; Girolametto et al., 1995; Hancock et al., 2002) and one research included child-teacher dyads (Van Craeyevelt et al., 2017). All studies provided a description of the participants, including age, gender, and disabilities. However, six articles omitted the participant race (46.15%) (Delaney & Kaiser, 2001; Girolametto et al., 1995; McIntosh & Dodd, 2008; O'Reilly et al., 2008; Stanton-Chapman & Brown, 2015; Van Craeyevelt et al., 2017). Among studies that reported the race of participants, the majority of participants were African-American children (n = 488), followed by Hispanic children (n = 265), European American children (n = 190), and children representing other ethnic groups (n = 104). The interventions were mainly conducted in the children's classrooms (53.84%) (Bulotsky Shearer et al., 2020; Jones et al., 2013; Justice et al., 2017; O'Reilly et al., 2008; Schneider & Goldstein, 2009) and self-contained classrooms (Stanton-Chapman & Brown, 2015; Van Craeyevelt et al., 2017). One study described an intervention delivered in the children's homes (Chao et al., 2006), two in childcare-centers (Delaney & Kaiser, 2001; Craig-Unkefer & Kaiser, 2002), one was both at children's home and a child-center (Girolametto et al., 1995; Hancock et al., 2002), and one study was both at home and a hospital (McIntosh & Dodd, 2008).

**3.2. Characteristics of the Interventions**

The review examined different characteristics of the applied interventions in each study to examine their efficacy and replicability. Ten of the studies (77%) were conducted within small groups (Justice et al., 2017; Delaney & Kaiser, 2001; Girolametto et al., 1995; Hancock et al., 2002; McIntosh & Dodd, 2008; O'Reilly et al., 2008; Schneider & Goldstein 2009; Stanton-Chapman & Brown, 2015; Van Craeyevelt et al., 2017), while only one article consisted of large group size (Jones

et al., 2013). Two studies did specify the groups sized of their interventions, but both were conducted at home (Bulotsky Shearer et al., 2020; Chao et al., 2006). The interventionists were the researchers themselves (46.15%) (Bulotsky Shearer et al., 2020; Craig-Unkefer & Kaiser, 2002; Justice et al., 2017; McIntosh & Dodd, 2008; Schneider & Goldstein, 2009; Stanton-Chapman & Brown, 2015), or cooperative teams of professionals and teachers (15.38%) (Van Craeyveldt et al., 2017; O'Reilly et al., 2008) or collaborative team of professionals and parent (30.76%) (Chao et al., 2006; Delaney & Kaiser, 2001; Girolametto et al., 1995; Hancock et al., 2002), or teachers (7.69%) (Jones et al., 2013).

The review found that the intervention strategies were teacher-child interaction quality and preschool language and literacy skills, family-centered early problem intervention program, peer play intervention, the parents' child-communication training intervention. The interventions also included the Hanen Program for Parents, parent education program Chicago school readiness project (CSRP) (teacher-child relationships quality and children's self-regulation), speech-therapy experiences in the public schools (STEPS), core vocabulary intervention, social problem-solving training, social story™ intervention, shared storybook social communication, and playing-2-together (P2G) (teacher-child interactions).

The teacher-child interaction quality and preschool language and literacy skills consisted of teachers supporting their students by providing emotional support, maintaining the classroom organization, instructional support, and managing the challenging behaviors within a classroom context. Family-centered early problem intervention program included training the parents on appropriate methods to approach their children (e.g., providing daily routine activities to enhance young children's language and behavior) and administering weekly parents' assessments. Peer play intervention strategy included conversational social strategies that provide an advanced organized playtime and the children's interaction by the interventionist. The interventionists establish a play theme plan for the intervention sessions. During the intervention sessions, the interventionist in an isolation area observes and record children's verbal and non-verbal interactions in the play area. The interventionist discusses and provides feedback on interactions during the previous play sessions to the children. Two studies (Hancock et al., 2002; Delaney & Kaiser, 2001) used the parents' child-communication training intervention, which was focused on improving the parents' and children's communication and behavior by providing communication training sessions for parents and children to enable them to generalize their interactions with their parents and others. The intervention involved balance turns, allowing children opportunities to respond, improving parents' responsiveness to their child's verbal behavior, giving straightforward and less frequent instructions. They study encourages parents to provide positive responses and feedbacks to improve child compliance and corrective responses; however, parent's should respond to a child's noncompliance and challenging behavior with adverse verbal reactions and lesser praising.

The interventions also included the Hanen Program for Parents, which is an interactive model of language intervention that aims to enhance and optimize the parent-child interactions by training parents to increase their interactions and responsiveness to their child's interests. Besides, the intervention administers language models and interventions following the child's level. Parent education program Chicago school readiness project (CSRP) is an intervention consisted of a multitier teacher and classroom-focused intervention sessions that focuses on supporting the development of proper self-regulation for children from low-income families by establishing emotionally close, positive relationships with teachers (i.e., teacher-child relationships quality and children's self-regulation). Further, speech-therapy experiences in the public schools (STEPS) is multicohort, prospective research designed to assess the progress of children with language impairment receiving an intensive treatment besides business-as-usual (BAU) practices. Throughout one school year, the researchers documented and collected evaluation data of children's progress in language skills, problematic behavior, self-regulation, and therapy (e.g., treatment intensity, service-delivery model) the correlations between the two.

The core vocabulary intervention involved teaching the students how to produce word phonology, in single words initially and in connected speech later. This intervention used default word plans and behavior outcomes to investigate the effects of previous interventions. Social problem-solving training consisted of multiple training sessions requiring to begin with a rationale for learning to speak audibly in class. This was immediately followed by the therapist's description of the classroom lesson and practicing five questions that the teacher would ask later in class for each training session. Social story™ intervention involved the interventionist reading passages for the children prior to the activities and asking them comprehension questions to evaluate their on-task and off-task behaviors and language levels. When they responded correctly to each question, the students were allowed to continue their targeted routine.

Shared storybook reading (social communication) and Theme-Based activity interventions consisted of integrating computer-generated storybooks in the intervention sessions. The story illustrates thematic play with picture icons (e.g., visiting the grocery store) and models for role-playing. The storybooks focused on specific thematic vocabulary (e.g., cart, register) and targeted three social communication skills (the initiations, responses, and adjacency approaches). Playing-2-together (P2G) (teacher-child interactions) (Vancraeyveldt et al., 2010, 2015) included one-on-one playing sessions between the teacher and child for 12 weeks. The playing sessions included relationship games that targeted the development and advancement of students and teacher relationship quality. Besides, another game (rule game) focused on improving the teacher's behavioral management.

### **3.3. Research Design Features**

Studies generally focused on measuring speech and language development, be-

havior development, and social communication, with a total of eight studies (61.53%) (Chao et al., 2006; Craig-Unkefer & Kaiser, 2002; Delaney & Kaiser, 2001; Girolametto et al., 1995; Hancock et al., 2002; McIntosh & Dodd, 2008; O'Reilly et al., 2008; Stanton-Chapman & Brown, 2015). One research only focused on examining children's behavior (Schneider & Goldstein, 2009), while O'Reilly et al. (2008) focused on children's ability to produce audible vocalizations rather than language skills. Other studies focused on children's self-regulation and their interactions specifically with their peers or teachers (Stanton-Chapman & Brown, 2015; Jones et al., 2013; Justice et al., 2017). One study measured on-task behavior (Schneider & Goldstein, 2009), while Van Craeyevelt et al. (2017) examined externalizing behavior.

The review examined the methodological designs of these studies in order to determine the findings' trustworthiness, generalizability, and replicability. Accordingly, the present review found that, across the 13 reviewed studies, a total of seven studies (53.84%) were multiple-baseline single-subject design (Craig-Unkefer & Kaiser, 2002; Delaney & Kaiser, 2001; Hancock et al., 2002; McIntosh & Dodd, 2008; O'Reilly et al., 2008; Schneider & Goldstein, 2009; Stanton-Chapman & Brown, 2015), four studies (30.76%) were RCT (Chao et al., 2006; Girolametto et al., 1995; Jones et al., 2013; Van Craeyevelt et al., 2017), and only two studies (15.38%) were QEDs (Bulotsky Shearer et al., 2020; Justice et al., 2017). **Table 1** represents a summary of the examined research.

### 3.4. Quality Indicators

The quality indicators developed by CEC and WWC provided standards procedures for researchers to evaluate the methodology of evidence-based practices included in this review. Further, the CEC quality indicators provide the quality indicator matrix to code and determine methodologically sound studies. Of the total 13 research studies, nine studies (69.23%) (Chao et al., 2006; Craig-Unkefer & Kaiser, 2002; Delaney & Kaiser, 2001; Girolametto et al., 1995; Hancock et al., 2002; O'Reilly et al., 2008; Schneider & Goldstein, 2009; Stanton-Chapman & Brown, 2015; Van Craeyevelt et al., 2017) met the CEC quality indicators and yielded an absolute result of 100%. Three studies (Justice et al., 2017; Jones et al., 2013; Bulotsky Shearer et al., 2020) yielded a weighted coding scheme of more than or equal to 80%, with an average of 88.38%. However, one study McIntosh & Dodd (2008) failed to meet the quality indicators of CEC as it had a result of 74% since it did not meet the quality of intervention agents and had partial credits in treatment implementation fidelity and outcome measures/dependent variables.

## 4. Discussion

Educators and parents encounter numerous challenges and hardships while dealing with children exhibiting behavior problems concurrently with speech and language delays. Therefore, this systemic review conducted a comprehensive search of the literature in order to identify empirical studies that examined be-

havior outcomes for students with speech and language delays between the ages of three and eight years old. The review intends to inform research and practice on managing children's behavior problems by identifying and evaluating effective interventions for promoting and improving behavior outcomes of children with speech and language delays. Accordingly, the review found that interventions targeting speech and language skills development, behavior development, and social communication skills development were the most common interventions to improve children's behavior outcome, as indicated by a total of eight studies (61.53%) of the included studies in this review. The results of these studies were overall positive on behavior and language (Chao et al., 2006; Craig-Unkefer & Kaiser, 2002; Delaney & Kaiser, 2001; Girolametto et al., 1995; Hancock et al., 2002; McIntosh & Dodd, 2008; O'Reilly et al., 2008; Stanton-Chapman & Brown, 2015). Mainly or partly focusing on behavior development in the implemented interventions may have reinforced their overall effect on behavior and language as well.

There's a lack of discussion on the heterogeneity of interventions and outcome measures, which may affect the generalizability of the findings. The discussion has been expanded to address the diverse nature of interventions and outcome measures across the studies. The interventions varied significantly, including teacher-child interaction quality (Bulotsky Shearer et al., 2020), family-centered interventions (Chao et al., 2006), and social skills training (O'Reilly et al., 2008). This heterogeneity makes it challenging to draw unified conclusions about the effectiveness of specific intervention components. Additionally, the outcome measures ranged from improvements in speech and language skills to behavioral outcomes, further complicating the synthesis of results. By acknowledging these differences, the paper now better addresses the potential limitations in the generalizability of the findings.

Enhancing the behavior outcomes of children is essential. This is especially important since results from studies indicated that improving the behavior of children resulted in developing their speech and language skills. It also enhanced their social communication and relationships with others, especially their parents; thus, demonstrating the significant role of children's parents. Improving child-parent relationships is therefore critical for a child's healthy development. Enrolling parents in the provided interventions as Chao et al. (2006), Delaney & Kaiser (2001), Girolametto et al. (1995), and Hancock et al. (2002) did through providing parents' training programs could have other desirable outcomes; for instance, increasing the chances of maintaining the positive changes and generalizing the children's improved communication skills to their interactions with others.

Nevertheless, the role of teachers is equally significant in providing instructional and emotional supports to children, which contributed to improving their speech and language skills, self-regulation, and their general behaviors during classes while reducing their externalizing behaviors, as demonstrated by Bulotsky Shearer et al. (2020), Jones et al. (2013), and Van Craeyvelt et al. (2017).

Support provided by teachers also contributed to improving their interactions with their peers (Stanton-Chapman & Brown, 2015; Jones et al., 2013; Justice et al., 2017). Bulotsky Shearer et al. (2020) and Justice et al. (2017) found a direct association between children-teacher interaction quality and children's challenging behaviors and language skills development in preschoolers.

Furthermore, three studies showed the effectiveness of integrating stories and technologies in interventions through combining personal stories, books, and playing to improve their social communications skills, externalizing behavior, and on-task behavior (Schneider & Goldstein, 2009; Van Craeyevelt et al., 2017; Stanton-Chapman & Brown, 2015).

In improving the child's behavior, practitioners are also potentially improving their academic development. Further, the collaboration between professionals (e.g., educators, speech-language therapists, and psychologists) and children's parents is essential for successful interventions. Interventions targeting child-parent, child-teacher, and child-peer relationships have potential to improve not only academic achievement but also healthy development. Therefore, interventions for children with speech and language delays should consider also including behavior management and promoting social communications skills. Thorough examination of the methodologies used in the included studies has been conducted. Single-subject designs, while useful for detailed, individualized observations, lack the generalizability and control over confounding variables that RCTs provide. The small sample sizes in single-subject studies (e.g., Craig-Unkefer & Kaiser, 2002 with 6 children) limit the ability to apply findings broadly. In contrast, RCTs (e.g., Jones et al., 2013 with 467 children) offer robust data due to random assignment and larger sample sizes, enhancing the reliability and validity of the results. However, RCTs can be more resource-intensive and may face ethical considerations when withholding potentially beneficial interventions from control groups.

The paper may not provide an extensive critique of the methodologies of included studies, potentially overlooking the limitations of single-subject designs versus randomized control trials (RCTs). To address this, a thorough examination of the methodologies used in the included studies has been conducted. Single-subject designs, while useful for detailed, individualized observations, lack the generalizability and control over confounding variables that RCTs provide. The small sample sizes in single-subject studies (e.g., Craig-Unkefer & Kaiser, 2002 with 6 children) limit the ability to apply findings broadly. In contrast, RCTs (e.g., Jones et al., 2013 with 467 children) offer robust data due to random assignment and larger sample sizes, enhancing the reliability and validity of the results. However, RCTs can be more resource-intensive and may face ethical considerations when withholding potentially beneficial interventions from control groups.

This systemic review conducted a comprehensive search of the literature and identified published research to investigate the effectiveness of behavior and speech and language interventions. Although the steps used for data collection

and evaluation were painstaking and thorough, it is still possible that this review may have omitted something of importance. This scoping review has some limitations due to the limited research as the majority of yielded studies that met the inclusion criteria are single-subject designs. Although single subject designs provide evidence of effectiveness in examining behavioral interventions, they produce limited information in determining the ability to generalize the findings of studies in more diverse populations, and the findings cannot always be generalized to other groups of children.

## 5. Conclusion

Despite these limitations, the present review presents valuable information to the field and classrooms of special education. Researchers and practitioners should consider the value of behavior interventions in dealing with children with speech and language delays and other learning disabilities. Accordingly, future research should examine behavioral interventions, including larger and more diverse populations, by conducting RCTs and including children with other language disorders and other age groups to investigate the impact of challenging behavior on the children's development and academic achievements. Further research investigating the individual components of these interventions and their efficacy in isolation or combination to determine the most practical features for managing challenging behaviors and their long-term impact is crucial. Further research should, therefore, also examine the maintenance of intervention effects.

This systemic review study conducted a comprehensive search of the literature in order to identify empirical studies that examined behavior outcomes for students with speech and language delays between the ages of three and eight years of age. Accordingly, the study findings include the most common interventions targeting reducing children's behavioral problems and enhancing their social communication and relationships with their parents, teachers, and peers. These interventions positively affected children's behaviors and interactions with others. Besides, these interventions improved children's speech and language skills and thus also enhanced their academic achievements. The present review, therefore, concluded that interventions for children with speech and language delays who also exhibit challenging behavior should include behavior management and promoting social communications skills.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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