

Research Article

Embedding Social–Emotional Learning in Elementary School–Based Speech–Language Therapy: A Pilot Randomized Controlled Trial

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ARTICLE INFO**Article History:**

Received January 8, 2025

Revision received April 22, 2025

Accepted May 26, 2025

Editor-in-Chief: Karla N. Washington

Editor: Yolanda Holt

https://doi.org/10.1044/2025_LSHSS-25-00001

ABSTRACT

Purpose: Many students with communication disorders have unique social–emotional needs, yet school speech–language pathologists (SLPs) are not typically trained in how to address those needs. We developed a new training (STIRS [SLP Training to Increase Resilience in Students]) to equip elementary school SLPs to embed social–emotional learning (SEL) practices within their routine speech–language sessions with K–3 students with communication disorders. The primary objective of this pilot trial was to evaluate the preliminary effects and feasibility of STIRS.

Method: This was a single-blind, parallel two-arm pilot randomized controlled trial with elementary school SLPs within a local education agency in Iowa. At a scheduled professional development meeting, the SLPs were randomly assigned to either the STIRS condition or active control condition (speech assessment of bilingual students). Both conditions involved a one-time 3-hr training. SLPs' attitudes, knowledge, and self-efficacy in addressing SEL with their K–3 students were measured immediately before and after the training. After the training, we also collected data on acceptability, appropriateness, and feasibility to inform a future definitive trial.

Results: Twenty SLPs who attended the professional development meeting consented to participate, were randomized by remote web-based allocation, and completed both pretraining and posttraining measures (12 SLPs in the STIRS condition and eight in the active control condition). Compared to the control group, there was a small positive main effect of the STIRS training on SLPs' openness, knowledge, and self-efficacy immediately posttraining. The SLPs in the STIRS condition also reported adequate levels of acceptability, appropriateness, and feasibility of the training.

Conclusions: The one-time STIRS training has the potential to increase SLPs' willingness and confidence to support SEL of K–3 students with communication disorders. In a future definitive trial, engagement could be enhanced through more clinical application training. Enrollment challenges may be mitigated by using a different design (e.g., team-based coaching, waitlist control).

Communication disorders in childhood can profoundly affect social–emotional development including peer relationships, self-esteem, behavioral health, and academic outcomes. Speech–language pathologists (SLPs) are

trained to behaviorally address speech and language impairments and may be underequipped to support the social–emotional needs of students with communication challenges. In this study, we sought to address this gap by developing a pilot training program for school-based SLPs to enhance their ability to support the social–emotional learning (SEL) of elementary students in grades K–3 with communication disorders and by evaluating the preliminary effectiveness of this program.

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Disclosure: The authors have declared that no competing financial or nonfinancial interests existed at the time of publication.

About 10% of children under the age of 10 years have a communication delay or disorder (Black et al., 2015), although this may underestimate the current prevalence impacted by the COVID-19 pandemic (Charney et al., 2021; Hessami et al., 2022; Nevo, 2024; Wener et al., 2023). Broad social-emotional impacts of communication disorders have been documented in children (Beitchman et al., 1996; Farquharson & Boldini, 2018). For example, when compared to typically developing peers, children who stutter often harbor negative communication attitudes (Guttormsen et al., 2015), children with speech sound disorders are often teased (McLeod et al., 2013), children with developmental language disorder have smaller peer groups (Chen et al., 2020), and children who are Deaf/hard of hearing often report lower levels of social competence (Hoffman et al., 2015; Stevenson et al., 2015; Wheeler & Tharpe, 2020). Students who stutter, with speech sound disorders, and who are Deaf/hard of hearing may be less willing to participate orally in class and social interactions (McAllister, 2016; McLeod et al., 2013; Toe et al., 2007). Of course, there are vast individual differences in how children with communication disorders cope with communicative adversity. While some may externalize their frustrations (Petersen et al., 2013), others may internalize them, as documented by higher levels of anxiety in this population than typically developing peers (Bernard et al., 2022; Brownlie et al., 2016; Theunissen et al., 2012). Communication breakdowns associated with speech-language impairments can also lead to challenging behaviors (Gregg, 2017), depending on the child's emotional and behavioral self-awareness (Factor et al., 2016) and self-management skills (Pena, 2000). These social-emotional and behavioral characteristics are not only outcomes of communication difficulties, but they also interact with communication itself. Emotional regulation and social understanding are critical for initiating and sustaining peer interactions, for participating in classroom activities, and for advocating for one's needs. As such, these are not tangential to SLPs' work but central to helping children become effective communicators across settings (Timler et al., 2025).

We conceptualize this complex array of factors that impact children's functioning through the World Health Organization (WHO)'s International Classification of Functioning, Disability and Health-Children and Youth Version (ICF-CY; WHO, 2007). Within the ICF-CY framework, communication disorders are a biopsychosocial issue with interconnections among the underlying impairment, personal factors, and environmental barriers, which collectively affect a child's participation in life activities (e.g., Westby & Washington, 2017; Yaruss & Quesal, 2004). While SLPs are typically trained to address specific behavioral aspects of communication and not necessarily personal factors and environmental barriers, the

ICF-CY framework motivates clinicians to implement a more holistic approach that focuses on increasing individuals' communication participation (Baylor & Darling-White, 2020). This is particularly relevant in the school system given that SLPs are increasingly involved in multi-tiered system of supports and collaborative approaches to support students' academic and social success, making them well-positioned to contribute meaningfully to school-wide SEL efforts. The standing issue is that there is very limited guidance, training, and time for SLPs to address the totality of children's communication experiences, which we aim to start addressing in this study.

In this project, we sought a preventative approach to support the SEL of children with communication disorders through their routine school-based speech-language therapy. To do so, we targeted school-based SLPs who work with students in the early elementary years so they can support the SEL of their students when full habilitation of communication skills is most likely, given that children who continue to have issues with speech-language after the age of 8 years are more likely to have long-term impairments (Catts et al., 2008; Shriberg et al., 1994). Consequently, the proposed training targeted SLPs who serve students who are 5–8 years old to maximize the potential for a protective effect.

To help us identify which SEL skills to target in our study, we used the Collaborative for Academic, Social, and Emotional Learning framework (CASEL, n.d.; <https://casel.org>). The CASEL framework is composed of five interrelated competencies: *self-awareness* and *self-management* (which comprise intrapersonal SEL), *social awareness* and *relationship skills* (which comprise interpersonal SEL), and *responsible decision making* (integrates both intrapersonal and interpersonal elements). While all five areas are relevant for promoting positive youth development among all children (Taylor et al., 2017), including those with communication challenges, targeting all five within a single training would likely overwhelm the participating SLPs. To maximize the feasibility and likelihood that SLPs would feel equipped to implement the new skills from the training, we selected a subset of CASEL competencies to target for this pilot study: the two intrapersonal competencies of self-awareness and self-management.

These two domains are foundational precursors to developing more interpersonal and integrated skills subsumed in the other domains. *Self-awareness* is understanding one's own emotions, thoughts, and values and understanding how these factors influence one's behavior. According to CASEL, self-awareness involves identifying emotions; identifying strengths and limitations; integrating identities; honesty and integrity; linking feelings, values, and thoughts; self-efficacy; growth mindset; and developing

interests and a sense of purpose. *Self-management* is effectively managing one's own emotions, thoughts, and behaviors and achieving goals and aspirations. According to CASEL, self-management involves managing emotions, delaying gratification, identifying and using stress management strategies, self-motivation, setting personal goals, demonstrating agency to accomplish goals, planning and organizing, and having courage to take initiative.

These two skills are highly relevant to the social-emotional needs of children with a variety of communication disorders. For example, children with developmental language disorder have shown difficulty with emotional awareness and regulation (St. Clair et al., 2019; van den Bedem et al., 2018), as we also can see with children who stutter (Bernard et al., 2022; Jones et al., 2014), Autistic children (Huggins et al., 2021), children who are Deaf/hard of hearing (Batten et al., 2014), and children with speech sound disorder (Wren et al., 2023). Thus, improving self-awareness (e.g., recognizing one's own communication strengths and challenges, identifying emotions) and self-management (e.g., developing strategies to manage frustration or anxiety related to communication) may serve as essential building blocks for broader participation and well-being, which we demonstrate in our logic model (see Figure 1).

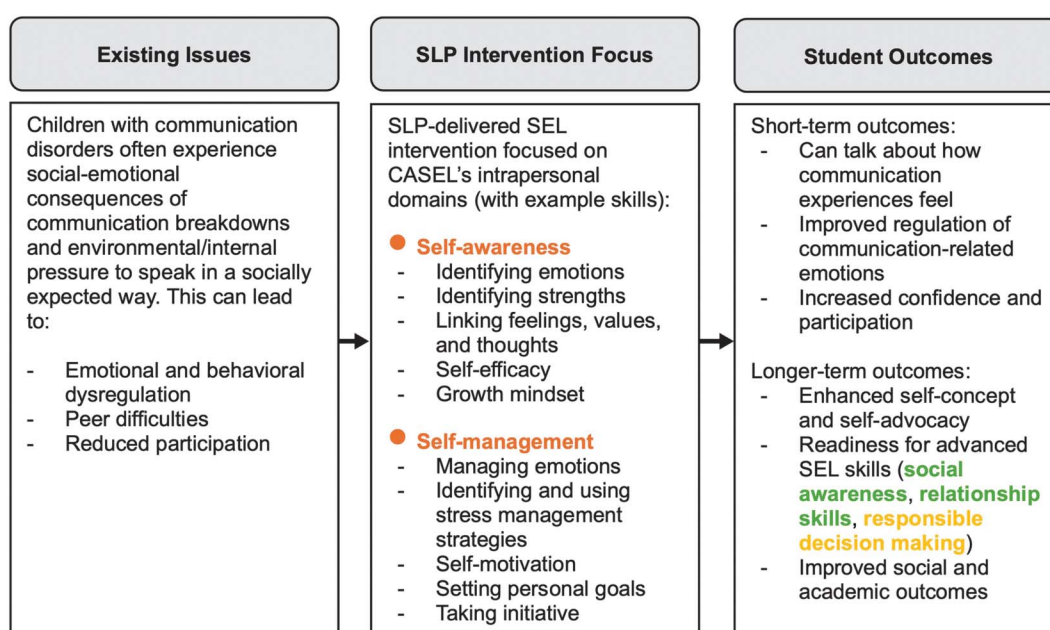
Furthermore, these two skills closely align with the role of SLPs, who are uniquely positioned to support students' emotional development in communication contexts.

The American Speech-Language-Hearing Association (ASHA) scope of practice emphasizes counseling and self-advocacy skills, including helping students navigate emotional consequences of communication challenges and build awareness of their communication profile (ASHA, 2016). Focusing on these two domains enables SLPs to support foundational skills that can generalize across settings and contribute to students' social inclusion, learning, and long-term outcomes. Together, self-awareness and self-management are intrapersonal skills that support emotional and behavioral engagement, which can promote positive gains in speech-language therapy (Schmitt, 2020) and in children's day-to-day lives.

Purpose

There has been substantial research focus on equipping educators to support the social-emotional needs of students, including randomized controlled trials (RCTs) of those programs documenting their efficacy (e.g., Al-Jbouri et al., 2023; Cook et al., 2018; Schonert-Reichl et al., 2015; Schonfeld et al., 2015). However, there have been no published RCTs of SLP training to support the social-emotional needs of the students with communication disorders with whom they work. SLPs are uniquely positioned to support the social-emotional needs of these students if they are one of the only support staff working one-on-one with them. The purpose of this study was to

Figure 1. Logic model demonstrating the existing social-emotional learning (SEL) issues for elementary students with communication disorders, speech-language pathologist-guided intervention that integrates intrapersonal SEL skills to address those issues, and the anticipated short- and longer term student outcomes. The color-coded text aligns with the colors used to delineate the five SEL competencies in the CASEL framework (<https://casel.org/casel-sel-framework-11-2020>).



develop and pilot the effectiveness and acceptability of a new training program for elementary school-based SLPs to integrate self-awareness and self-management topics within their routine speech-language sessions with K–3 students with communication disorders. This pilot training program is called STIRS: SLP Training to Increase Resilience in Students. Our primary objective was to compare the effects of the STIRS training versus an active control training on SLPs’ attitudes, knowledge, and self-efficacy in supporting the self-awareness and self-management skills of K–3 students with communication disorders. Our secondary aim was to assess the extent that SLPs in the STIRS condition found the training acceptable, appropriate, and feasible for their work with K–3 students with communication disorders. By targeting self-awareness and self-management within speech-language intervention, we aim to address both communication and the social–emotional factors that shape how children engage in their learning and peer environments. This dual focus also aligns with recent calls to integrate SEL and inclusive practices for students with disabilities (Daley & McCarthy, 2021).

Method

Participants and Setting

A total of 22 SLPs consented to participate: 12 were randomly assigned to the STIRS training, and 10 were randomly assigned to the active control training. All participants had a master’s degree and were licensed to practice as an SLP in the state of Iowa. Two worked part-time while the rest worked full-time. Pertinent demographic details are provided in Table 1.

Study Procedure

We conducted a parallel-group, single-blind pilot RCT in accordance with the CONSORT guidelines for pilot or feasibility trials (Appendix B; Eldridge et al., 2016). Participants were allocated to condition through simple randomization. Study procedures were approved by the University of Iowa Institutional Review Board (No. 202207161).

Table 1. Descriptive statistics of participating speech-language pathologists and baseline equivalences ($n = 20$).

Demographic	Category	n	%	Baseline equivalence (χ^2)
Gender	Women	19	95	N/A ^a
	Men	1	5	
Race/ethnicity	White	19	95	N/A ^a
	Mixed	1	5	
Age (years)	20–30	2	10	N/A ^a
	31–40	13	65	
	41–50	2	10	
	51–60	3	15	
Current caseload	31–40	2	10	N/A ^a
	41–50	3	15	
	51+	15	75	
Years of speech-language pathology experience	0–5	3	15	$\chi^2(4) = 2.99, p = .56$
	6–10	4	20	
	11–15	9	45	
	16–20	3	15	
	21+	1	5	
Perceived percentage of students on caseload with internalizing issues (e.g., anxiety, depression, separation anxiety, social fears)	0%–25%	6	30	$\chi^2(3) = 8.64, p = .50$
	26%–50%	11	55	
	51%–75%	2	10	
	76%–100%	1	5	
Perceived percentage of students on caseload with externalizing issues (e.g., aggression, defiance, hyperactivity)	0%–25%	11	55	$\chi^2(2) = 5.35, p = .69$
	26%–50%	6	30	
	51%–75%	3	15	
	76%–100%	0	0	
Prior training about SEL	No	16	80	$\chi^2(1) = 0.47, p = .49$
	Yes	4	20	

Note. N/A = not applicable; SEL = social–emotional learning.

^aCertain demographic variables were highly disproportionate so we could not calculate baseline equivalence. These demographic variables were not included in our models.

Recruitment

Target participants were school-based SLPs who provide speech-language therapy to K–3 students with communication disorders. At a professional development meeting for a local education agency in Iowa scheduled 2 days before the start of the 2023–2024 school year, the principal investigator (PI; first author) and two project assistants visited a district building. This building was equipped with two separate rooms for the two trainings—one for the target STIRS training and one for the active control training. At the start of the scheduled meeting, the PI presented the informed consent letter to all attending SLPs (approximately 40). In reviewing the consent information, SLPs were not informed of the specific purpose of the study to evaluate the effects of the target STIRS training. Rather, they were informed that the researchers were interested in comparing the effects of two different trainings. SLPs who were interested in participating and eligible via self-screening (i.e., provide school-based SLP services to K–3 students with communication disorders) were directed to scan a QR code to a Qualtrics form to digitally provide their consent.

Trial Design

We programmed Qualtrics to do a simple randomization procedure so that upon participants' submission of the consent form on Qualtrics, the submission screen showed them their random assignment to either the STIRS condition or the active control condition. The research team had no influence over participants' random allocation to a condition. The remaining SLPs in attendance were allowed to choose which training to attend. The SLPs were blind to the specific purpose of the study (i.e., they were not told that the target condition was the STIRS training).

Both trainings were conducted at the same time, in the same building, and in two separate rooms. Both trainings (STIRS and active control) were delivered in a hybrid format. Each presenter was virtual, while the SLPs and training facilitators were in-person. The presenters attended via Zoom, where they and their slides were displayed on a large projector screen in the room. To minimize contamination, participants in each group were informed about the importance of not sharing information about their training with SLPs in the other group. Survey data were collected from the SLPs at two timepoints in August 2023: T1 (baseline pretest immediately before training) and T2 (posttest immediately after training). As shown in the CONSORT flow diagram in Figure 2, two participants who attended the active control training did not complete the T2 survey after their training, so the demographic information report are for the 20 participants who we had complete data for and were, thus, included in the final data analysis ($n_{\text{treatment}} = 12$, $n_{\text{control}} = 8$).

At both timepoints, we assessed SLPs' attitudes, knowledge, and self-efficacy in addressing self-awareness and self-management of K–3 students with communication disorders. Immediately after the training, we included survey items regarding the acceptability, appropriateness, and feasibility of the training. Most items were adapted from published measures that are commonly used in educational intervention implementation research, with minor wording adjustments to make the items specifically related to our training (see the Outcome Measures section below and Appendix A).

Study Conditions

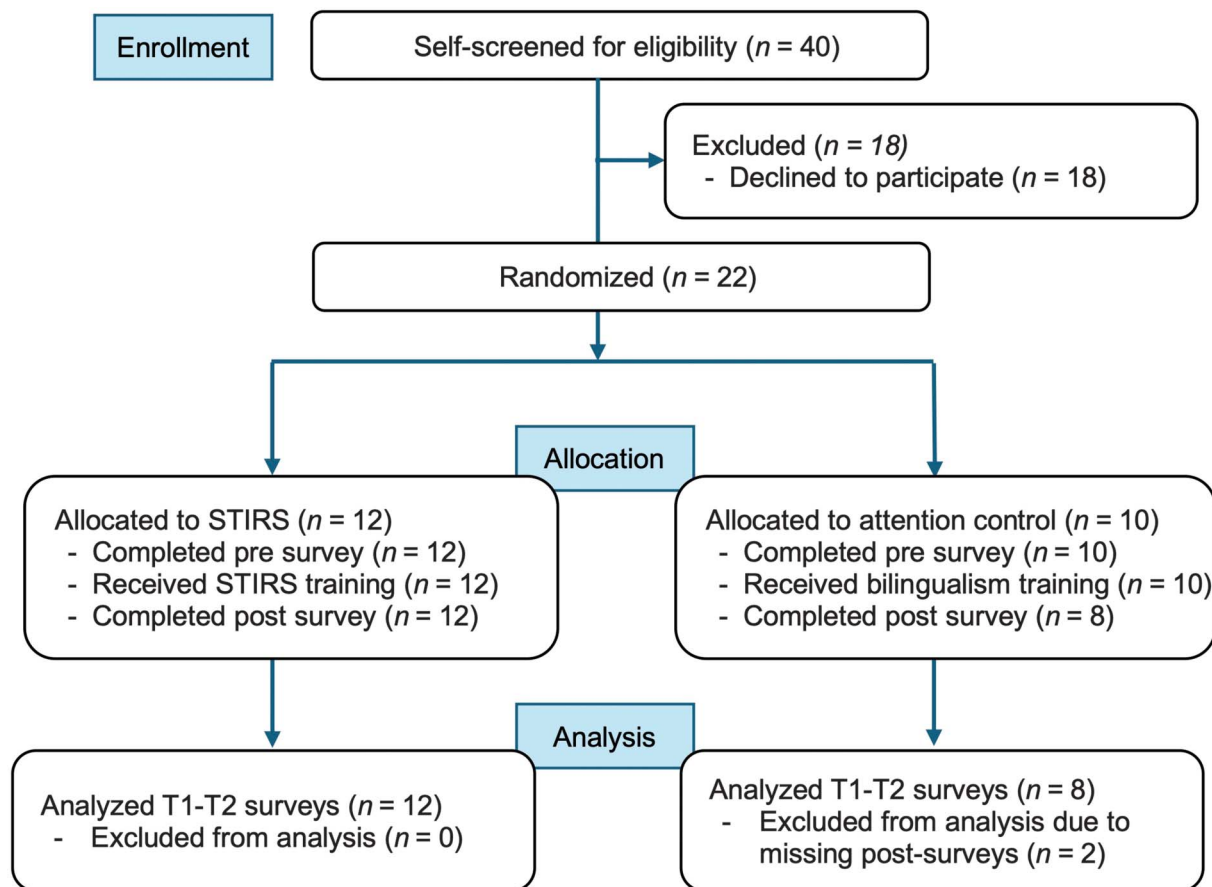
STIRS

Developing the STIRS training. The SEL skills that we selected to target in the STIRS training were self-awareness and self-management, as these are foundational to the development of other SEL and academic skills. We developed content for a single 3-hr training composed of three sections: background, therapeutic activities to target self-awareness and self-management, and case applications. The content of this training was vetted by a focus group of three experts in the area of SEL of children with communication disorders who were not involved in the project; they reviewed the content and provided constructive feedback, which we integrated into the administered training. In the following subsections, we describe how we developed each of these components.

Part I: Background. The training began with a review of the evidence on the social-emotional needs of K–3 students with communication disorders. We opened with a discussion of the ICF-CY model (WHO, 2007) that motivates our goal of enhancing children's participation rather than a narrow focus on addressing their impairment. We then shared research regarding the social-emotional impact of communication disorders on children, and then empirical benefits of a strengths- and resilience-based approach to speech-language therapy. We over-viewed the five SEL competencies within the CASEL framework and focused our attention on self-awareness and self-management.

Part II: Therapeutic activities. We then covered strategies that SLPs can embed for K–3 students to develop self-awareness and self-management skills within routine speech-language therapy sessions. We described how SLPs can use strategies and teaching practices to help students develop these skills. *Strategies* involve integrating self-awareness and self-management lessons in speech-language intervention activities that target students' Individualized Education Program (IEP) goals. For example, while targeting the production of /s/, the SLP may have the student read vignettes loaded with /s/ words about

Figure 2. The Consolidated Standards of Reporting Trials randomized pilot diagram delineates the study design timeline of enrollment, randomization, allocation, and assessments.



SEL skills (e.g., “Sonia sat down and stared at her sore legs. She started to cry softly. She had lost the race. Sonia feels ... [sad].”). As another example, while targeting language forms and inferencing, the SLP may use picture books that address SEL skills and ask questions such as, “How would you feel in that situation?,” “How does your body feel when you’re mad?,” “If you won a medal like this character, what would you do?,” and “How could this character help themselves feel better?” For a goal targeting written expression, the student could write a sentence about a time they felt a strong feeling, why they felt that way, and then they could draw a picture of themselves having that feeling.

Teaching practices create a therapeutic environment that supports students in developing competence in self-awareness and self-management. This could include the SLP using active listening skills (e.g., asking open-ended questions, reflecting back what students share, acknowledging feelings with a word, reframing), doing an energy check-in/check-out at the beginning and end of a session, modeling how the SLP feels and what it feels like in their

body, providing visual SEL supports (e.g., feelings flip chart, Zones of Regulation poster), having students observe and rate their own performance, and providing praise that supports growth mindset (e.g., “you worked really hard to figure that out” instead of “good job”; “that’s not quite right yet, you can learn this” instead of “that’s not right”; “I can see you’re getting better at ... ” instead of “you’re almost caught up to your classmates”).

The strategies and teaching practices we included were adapted from freely available CASEL programs, including “Changemakers” (CASEL SElect), “Captain McFinn: Explore Kindness” (CASEL Promising), and “Lion’s Quest: Skills for Growing” (CASEL Promising). CASEL SElect programs are those with demonstrated evidence of effectiveness at improving student outcomes at the highest level and support students’ social-emotional growth through all five CASEL competencies. CASEL Promising programs are those with demonstrated evidence of effectiveness at improving student or teacher outcomes and support students’ social-emotional growth through at least two CASEL competencies.

Part III: Case applications. We ended the training by dividing the SLPs into small groups and provided them with three cases that we developed to which they could apply the concepts we covered during Part II. For example:

Jax is a 6-year-old boy with a phonological disorder who enjoys art and sports. He has been working on productions in varying levels of difficulty within each session for 4 months. During your sessions, Jax seems to be on “autopilot”—he completes trials, but his attention, engagement, and motivation are low. You have been giving Jax target word lists for him to practice at home with his parents, but he frequently tells you that he has lost his sheet or that he forgot to practice.

The questions that followed included “What activities and discussions could you use to help Jax become aware of and share how he feels about his speech and speech therapy?” “How can you integrate a strengths-based approach?” and “What strategies and teaching practices could you employ to maximize Jax’s motivation and agency within the therapy session and for home practice?” After the small groups discussed all three cases, participants shared their main points with the whole group.

Active Control Condition

SLPs under the active control condition received a 3-hr training for assessing bilingual students. This training included background information about dual language acquisition, culturally responsive practice, and principles of assessing the speech and language skills of bilingual students. This training did not contain any similar elements to the STIRS training.

Outcome Measures

Attitudes About Social–Emotional Practices

We measured SLPs’ attitudes toward addressing students’ self-awareness and self-management in speech-language therapy using four of the most relevant subscales from the Evidence-Based Practice Attitude Scale (EBPAS; Aarons, 2004; Zhang et al., 2023). There were four items related to *openness*—the extent to which SLPs are generally open to trying new social–emotional practices with their students. There were four items related to *appeal*—the extent to which SLPs would adopt new social–emotional practices if they were intuitively appealing, made sense, could be used correctly, or were being used by colleagues who were happy with them. There were five items related to *fit*—the degree to which SLPs perceive social–emotional practices to fit with the needs of their

students and their clinical philosophy. There were three items related to *burden*—the degree to which SLPs perceive social–emotional practice to add undue burden to their work. For these 16 items, SLPs rated their level of agreement on a 5-point Likert scale (1 = *Not at all*, 5 = *To a very great extent*). In this analytic sample, the overall and subscales all showed acceptable to good internal consistency at pretest (Cronbach’s α range = .68–.89) and posttest (Cronbach’s α range = .69–.96).

Knowledge About Social–Emotional Practices

We developed an ad hoc five-item scale to assess SLPs’ knowledge of SEL, where they can access evidence-based resources to support their students’ SEL and what strategies are effective for supporting their students’ SEL. For these five items, SLPs rated their level of agreement on a 6-point Likert scale (1 = *Strongly disagree*, 6 = *Strongly agree*). We designed this scale to specifically address our research questions; we were not intending to design a measurement tool that could be used more broadly by researchers. In this analytic sample, this scale showed good internal consistency at pretest (Cronbach’s α = .86) and posttest (Cronbach’s α = .96).

Self-Efficacy About Social–Emotional Practices

We developed an ad hoc five-item scale to assess SLPs’ confidence in addressing the social–emotional needs of their students. For these five items, SLPs rated their level of agreement on a 6-point Likert scale (1 = *Strongly disagree*, 6 = *Strongly agree*). Similar to our knowledge scale described above, we designed this self-efficacy scale to specifically address our research questions; we were not intending to design a measurement tool for broad research use. In this analytic sample, this scale showed good internal consistency at pretest (Cronbach’s α = .86) and posttest (Cronbach’s α = .98).

Training Acceptability, Appropriateness, and Feasibility

At T2 (immediately posttraining), we assessed how acceptable, appropriate, and feasible the SLPs found the training using the Acceptability of Intervention Measure, Intervention Appropriateness Measure, and Feasibility of Intervention Measure developed by Weiner et al. (2017). Each of these three scales had four items. We also solicited feedback about what was effective and ineffective about the training. These data were not included in our quantitative analyses, but rather used to inform the next iteration of this training program in a future definitive trial. In this analytic sample, the three scales all showed acceptable to good internal consistency (acceptability, appropriateness, feasibility: Cronbach’s α = .88, .97, and .97, respectively).

Data Analysis

Before formal analysis, we ran diagnostic tests and confirmed that the assumptions for planned analysis (analysis of covariance [ANCOVA]) were generally met in the final analytic sample (e.g., normality of residuals and homoscedasticity). Then, we checked the validity of the random allocation (i.e., baseline equivalence) by running chi-square tests for demographics and independent-samples *t* tests for the baseline values of outcomes (i.e., self-efficacy, knowledge, the total score, and four subscale scores of attitudes). Considering the preliminary nature of this pilot trial, we used listwise deletion to handle missingness on key outcomes in all analyses to obtain conservative treatment effect estimates for STIRS (Enders, 2013).

For our primary aim in which we compared the effects of the STIRS training versus the active control training, we built a series of ANCOVAs to estimate the treatment effect of STIRS on each of the seven outcomes. We configured the models in a similar way, wherein the immediate posttest (T2) value of an outcome regressed on the focal predictor, study condition, that was coded as a binary variable (reference category = active control condition). In all ANCOVAs, we adjusted for the baseline value of the outcome and participant demographics as covariates (Wan, 2021). For coefficient estimation, we used the heteroskedasticity-consistent standard error estimator type 4 (i.e., HC4; Hayes & Cai, 2007) to adjust for potential bias due to the heterogeneity of the covariance matrix in the relatively small sample of our study. For our secondary aim, we calculated key descriptive statistics (e.g., mean, *SD*, and range) to explore the central tendency and distribution of participating SLPs' (only those in the treatment group) perceived acceptability, appropriateness, and feasibility of the content and procedure of STIRS training.

To ensure internal validity and clinical meaningfulness, the results of treatment effect analyses were interpreted via both statistical significance and standardized mean difference effect size (SMDES) estimates using pooled pretest standard deviations (Morris, 2008). The SMDES used the standard deviations as the basic unit to quantify the mean difference between the pretest versus the posttest changes of the target outcomes in the treatment group against those in the control group. During the study planning phase, we ran power analysis with the Optimal Design (Version 3.01; Raudenbush et al., 2011). As a pilot study, we anticipated a minimal level of power for the planned main effect analysis only. With $n = 20$, $\alpha = .05$, and 75% of the variance explained by all covariates, we expected adequate power ($\geq .80$) to detect an effect size (Cohen's *d*; Peng & Chen, 2014) equal to or greater than .66. The descriptive and baseline equivalence analyses were conducted with SPSS (Version 26), while

the ANCOVAs were fitted with the RLM macro (Version 1.02) in R (Version 4.4.1; R Core Team, 2024).

Results

Primary Aim: Main Effect Models of STIRS

The results of the *t* tests (for continuous outcomes) and chi-square tests (for categorical demographic variables) generally supported that the random allocation led to probabilistically equivalent study groups (treatment vs. control) regarding the baseline outcome and demographics of participants. For SLPs' attitudes toward SEL to improve the self-awareness and self-management of K–3 students with communication disorders (see Table 2), the results indicated that compared to the control group, SLPs who received STIRS showed a greater increase on their reported *Overall attitudes* ($b = 1.12$, $p < .01$, SMDES = 1.34) and specific attitudinal dimensions, that is, *Openness* ($b = 0.93$, $p < .05$, SMDES = 0.73), *Knowledge* ($b = 2.06$, $p < .01$, SMDES = 1.6), and *Self-efficacy* ($b = 1.73$, $p < .05$, SMDES = 1.19) about utilizing SEL for K–3 students with communication disorders compared to those in the control group. There were no significant changes in the three subscales of the EBPAS including *Appeal*, *Fit*, and *Burden*. As seen in Table 3, no significant demographic covariates were identified in the models.

Secondary Aim: Training Acceptability, Appropriateness, and Feasibility

The mean scores indicated that SLPs perceived the training content and procedure of STIRS as acceptable ($M = 3.02$, $SD = 0.58$, range = 2–4), appropriate ($M = 3.33$, $SD = 0.59$, range = 2.25–4), and feasible ($M = 3.23$, $SD = 0.47$, range = 2.75–4) for their work in elementary schools (possible mean scores could range from 0 to 4, with higher scores being more favorable). We also included bespoke items for the participating SLPs to identify specific aspects of the training they attended that they found to be effective or ineffective. Regarding effective elements of the training, 89% of respondents thought that the content was useful, 78% thought that having the training at the beginning of the school year was effective timing, 67% thought the length of the workshop (3 hr) was good, 56% found the case studies to be useful, 44% found the hybrid delivery to be effective, and 44% thought the small group discussions were useful. There was less consensus about what was ineffective about the training; 22% reported that there were not enough case studies or concrete examples of how to embed the topics/activities into therapy sessions. The other components of the training that could have been ineffective were only selected by one

Table 2. Independent-samples *t* tests of speech-language pathology baseline outcomes between treatment and control conditions.

Variable		STIRS group		Control group		<i>t</i> test for equality of means		
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
Baseline outcomes	Overall attitude	2.55	0.33	2.70	0.47	−0.85	18	.40
	Openness	2.60	0.42	2.78	0.73	−0.69	18	.50
	Appeal	2.88	0.29	3.19	0.51	−1.56	10.05 ^a	.15
	Fit	3.18	0.50	3.35	0.56	−0.69	18	.50
	Burden	1.00	0.82	0.88	0.59	0.37	18	.71
	Knowledge	3.55	0.86	3.53	0.91	0.06	18	.95
	Self-efficacy	3.73	0.90	3.50	0.91	0.56	18	.58

Note. STIRS = SLP Training to Increase Resilience in Students.

^aAdjusted degree of freedom due to heterogeneity of variances.

participant, indicating there was no consistent ineffective element of the training. When asked what strategies would have been helpful in supporting their implementation of the content, most respondents reported team meetings with members of their local education agency and the project team.

Discussion

Although many children with speech-language impairments have adverse social-emotional experiences related to communication adversity, there is inadequate training for SLPs to address these needs with their students despite it being within their scope of practice. In this study, we conducted a parallel two-arm pilot RCT with 20 SLPs within a local education agency in Iowa to test the preliminary effects and acceptability of a 3-hr training (STIRS) on SLPs' attitudes, knowledge, and self-efficacy in addressing SEL with their K–3 students. We also collected descriptive data about the acceptability, appropriateness, and feasibility of the training. Primary findings revealed a small positive main effect of the STIRS training on SLPs' openness (a component of attitudes), knowledge, and self-efficacy for addressing the social-emotional needs of K–3 students who they serve. SLPs rated the trainings as appropriate, acceptable, and feasible, noting that the content of the trainings was useful and having the trainings at the beginning of the school year was effective timing. SLPs reported that implementation could have been improved with team meetings with members of their local education agency and the project team. Together, the findings suggest that a one-time STIRS training has the potential to increase SLPs' willingness and confidence to support the SEL of K–3 students with communication disorders, which warrants a future definitive trial.

Evidence-Based SLP Training

Evidence-based intervention, across topic areas, has been ranked as the most important form of training

needed by new SLPs (Heilmann & Bertone, 2021). Frequently identified areas of practice-specific knowledge gaps for school-based SLPs are in the areas of IEPs/school administration, interprofessional collaboration, multilingualism/language variation, SEL/counseling, autism, augmentative and alternative communication, and phonetic transcription (Costigan & Light, 2010; Heilmann & Bertone, 2021; White et al., 2022). Despite a clear need for effective professional training programs in these content areas, the evidence base to support this need is sparse.

Although there are no studies that report on the effectiveness of SLP training to integrate our targeted SEL topics within routine speech-language therapy against which we can directly compare our findings, there are adjacent topics, particularly related to counseling skills and social communication, that we can indirectly compare. For example, in their study of 15 preservice SLPs, Byrd et al. (2022) evaluated a training for stuttering intervention that specifically targets active listening skills called STEPS (Simulated Training in Evidence-Based Practice for Stuttering). This study found high acceptability of the content and significant improvement in at least one aspect of client-directed active listening. No information about attrition was reported. In another study targeting SLP counseling skills, Sekhon et al. (2023) conducted a Phase II RCT to evaluate a training program in counseling for SLPs to support the well-being of persons with poststroke aphasia. This study found significant improvement in counseling self-efficacy and self-rated competency, maintained at a 5-week follow-up. Attrition of participating SLPs was reported at about 20%, with 41 SLPs completing the study. Reasons for attrition included work, work-related scheduling conflicts, and illness.

While social communication interventions are common for autistic students (e.g., Adams et al., 2012; Nowell et al., 2019), they are less common for children with other communication differences and challenges. Some researchers have explored embedding social communication targets within

Table 3. Analysis of covariances controlling for pretest values and demographics as covariates.

Outcome	Variable	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	LLCI	ULCI	SMDES
Overall attitude	<i>Intercept</i>	−1.72	1.36	−1.27	.23	−4.69	1.24	1.34
	Age	−0.17	0.41	−0.42	.68	−1.06	0.72	
	Work experience	0.19	0.28	0.68	.51	−0.42	0.80	
	Internalizing	0.49	0.34	1.44	.18	−0.25	1.22	
	Externalizing	0.14	0.26	0.54	.60	−0.42	0.70	
	Prior training	−0.16	0.30	−0.52	.61	−0.81	0.50	
	Study condition	1.12	0.35	3.25	.01	0.37	1.88	
	Baseline outcome	1.01	0.35	2.89	.01	0.25	1.77	
Openness	<i>Intercept</i>	−1.05	1.32	−0.79	.44	−3.94	1.84	0.73
	Age	0.11	0.46	0.24	.81	−0.89	1.12	
	Work experience	0.09	0.30	0.32	.75	−0.55	0.74	
	Internalizing	0.28	0.37	0.76	.46	−0.53	1.09	
	Externalizing	0.07	0.30	0.22	.83	−0.58	0.71	
	Prior training	−0.44	0.35	−1.26	.23	−1.19	0.32	
	Study condition	0.93	0.34	2.70	.02	0.18	1.67	
	Baseline outcome	0.91	0.4	2.26	.04	0.03	1.79	
Appeal	<i>Intercept</i>	−1.11	3.74	−0.30	.77	−9.26	7.04	2.77
	Age	−0.55	0.68	−0.80	.44	−2.04	0.95	
	Work experience	0.45	0.47	0.95	.36	−0.58	1.48	
	Internalizing	1.02	0.71	1.45	.17	−0.51	2.56	
	Externalizing	0.25	0.69	0.37	.72	−1.25	1.76	
	Prior training	0.49	0.43	1.12	.28	−0.46	1.43	
	Study condition	1.88	0.98	1.93	.08	−0.25	4.01	
	Baseline outcome	0.23	1.03	0.23	.82	−2.00	2.47	
Fit	<i>Intercept</i>	−0.71	1.31	−0.54	.60	−3.56	2.15	0.34
	Age	−0.17	0.46	−0.37	.72	−1.18	0.84	
	Work experience	0.27	0.31	0.88	.39	−0.4	0.95	
	Internalizing	0.56	0.33	1.71	.11	−0.16	1.28	
	Externalizing	0.01	0.27	0.02	.98	−0.58	0.59	
	Prior training	−0.17	0.34	−0.5	.63	−0.92	0.58	
	Study condition	0.77	0.38	2.04	.06	−0.05	1.59	
	Baseline outcome	0.75	0.22	3.42	.01	0.27	1.22	
Burden	<i>Intercept</i>	0.44	0.87	0.50	.63	−1.47	2.34	0.71
	Age	0.42	0.60	0.71	.49	−0.88	1.72	
	Work experience	−0.47	0.39	−1.20	.25	−1.31	0.38	
	Internalizing	−0.28	0.36	−0.79	.45	−1.07	0.5	
	Externalizing	0.11	0.28	0.38	.71	−0.51	0.73	
	Prior training	−0.01	0.32	−0.02	.98	−0.71	0.7	
	Study condition	0.35	0.31	1.15	.27	−0.32	1.02	
	Baseline outcome	0.68	0.37	1.86	.09	−0.12	1.48	
Knowledge	<i>Intercept</i>	−0.82	1.79	−0.46	.66	−4.71	3.08	1.6
	Age	−0.32	0.74	−0.44	.67	−1.93	1.28	
	Work experience	0.10	0.40	0.24	.81	−0.78	0.98	
	Internalizing	1.03	0.66	1.56	.14	−0.40	2.45	
	Externalizing	−0.37	0.48	−0.78	.45	−1.41	0.67	
	Prior training	−0.42	0.75	−0.57	.58	−2.05	1.20	
	Study condition	2.06	0.63	3.29	.01	0.70	3.43	
	Baseline outcome	0.86	0.46	1.86	.09	−0.15	1.86	

(table continues)

Table 3. (Continued).

Outcome	Variable	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	LLCI	ULCI	SMDES
Self-efficacy	<i>Intercept</i>	0.87	1.20	0.72	.48	−1.75	3.49	1.19
	Age	0.27	0.94	0.28	.78	−1.79	2.32	
	Work experience	−0.18	0.52	−0.35	.73	−1.32	0.95	
	Internalizing	0.51	0.94	0.54	.60	−1.55	2.56	
	Externalizing	−0.06	0.53	−0.11	.92	−1.21	1.10	
	Prior training	0.60	0.45	1.32	.21	−0.39	1.58	
	Study condition	1.73	0.75	2.32	.04	0.10	3.36	
	Baseline outcome	0.24	0.32	0.74	.47	−0.46	0.93	

Note. *b* = unstandardized coefficients; *SE* = heteroscedasticity-consistent standard error type 4; LLCI = lower limit of the 95% confidence interval of *b*; ULCI = upper limit of the 95% confidence interval of *b*; SMDES = mean differences with pooled pretest standard deviations; Internalizing = experience with students with internalizing disorders; Externalizing = experience with students with externalizing disorders; Study condition = SLP Training to Increase Resilience in Students (STIRS) versus control group (reference = control group).

speech-language therapy for non-autistic pediatric populations. For example, Brinton and Fujiki (2019) presented a tutorial and preliminary case study findings for using bibliotherapy with children with developmental language disorder to pursue language processing, conversational, and SEL skills within the same book-based activities. Through their work, they concluded that it is feasible to facilitate these three skills simultaneously within relatively short, school-based intervention sessions. Furthermore, they argued that children with developmental language disorder need explicit instruction in all three of these domains to facilitate cooperative communication, build personal relationships, and comprehend stories and events.

In consideration of the results of the current study and the results of other RCTs evaluating SLP training, there is accumulating evidence to support the efficacy of relatively short trainings (e.g., 3 hr) in improving knowledge and readiness to implement new approaches among SLPs, although it is clear that more studies are needed to evaluate long-term effects and distal outcomes, such as impact on students or clients with communication disorders. Additionally, challenges related to SLP recruitment and attrition were common among these studies, highlighting a potential methodological barrier hindering research in this area. Although continued professional development is an obligatory component of SLP practice per ASHA and state licensure requirements, there appears to be a disconnect between training provision and research participation in this context.

SEL in SLP Training

The STIRS training for SLPs increased their openness to using new SEL practices with their students, their knowledge of SEL practices, and their self-efficacy in addressing SEL with their students. An attitude of increased openness may reflect a more proactive stance toward

improving the social-emotional outcomes of students with communication disorders, which can include willingness to engage with new ideas, seek out professional development, and experiment with different techniques that could benefit their students. This is consistent with the observed increase in knowledge, which includes knowledge of SEL concepts and how to access evidence-based SEL resources. The observed improvement in self-efficacy reflects SLPs' increased confidence in supporting SEL for their students with communication disorders; however, other aspects of SLPs' attitudes toward SEL (i.e., appeal, fit, burden) were not significantly changed by the training, which indicate limitations to their self-efficacy.

Appeal refers to the attractiveness of SEL practices to SLPs, including whether these practices are intuitively appealing, make sense, can be used correctly, or are endorsed by others. A lack of change in appeal may indicate that SLPs are not yet aware of peers implementing SEL practices, perceive a lack of evidence to support implementation, or maintain skepticism toward the immediate usability of SEL strategies or direct relevance to their scope of practice. Fit refers to the degree to which SLPs perceive SEL practices to align with the needs of their students and their current clinical practice and philosophy. A lack of change in fit may indicate a barrier between SLPs' current practices or environments and implementation of SEL practices. Burden involves the perceived additional workload that SEL practices might impose on SLPs. Practices that are seen as burdensome are less likely to be adopted, as they may require significant time, effort, or resources that SLPs might not have. A lack of change in burden may reflect that SLPs are cautious about adopting new practices that could add to their workload or that their perception of added burden is not offset by their perception of clear, immediate benefits.

Together, these results indicate that STIRS increased SLPs' knowledge of SEL practices and their confidence in

implementing them with their students. Furthermore, after the training, SLPs were more open to SEL practices and perceived the potential benefits of their use with their students; however, their adoption of SEL practices appears to be influenced by a combination of attitudes and perceptions related to efficacy and direct benefit, a lack of peer models and support, and practical constraints. Nevertheless, SLPs are willing to consider, continue learning about, and explore new SEL practices, even if they are not yet immediately confident in their ability to implement them. For SLPs who received this training, SEL practices that are perceived to have higher intuitive appeal, better fit to their current practice, and less burden on their workload would be more likely to be adopted. These practices might be those that seamlessly integrate into existing intervention plans, are backed by evidence, the limited evidence base, and incorporate techniques and strategies already used by SLPs.

SLP Scope of Practice

The finding that *fit* and *burden* did not significantly change as a result of the STIRS training suggests that SLPs may be wary of how targeting SEL skills within speech-language therapy fits within their scope of practice. According to the WHO ICF-CY model, addressing the underlying communication impairment is just one part of our role; addressing participation and activity limitation while considering personal and environmental factors is also paramount (ASHA, 2016). ASHA (2016) explicitly states that counseling is within our scope of practice: “The role of the SLP in the counseling process includes interactions related to emotional reactions, thoughts, feelings, and behaviors that result from living with the communication disorder, feeding and swallowing disorder, or related disorders”. As a result, ASHA recently added a new special interest group (SIG 20) dedicated to the advancement of counseling in our profession. Given the growing evidence that children with a wide range of communication disorders experience negative social-emotional effects, we argue that it is within SLPs’ scope of practice to not only integrate counseling skills into their therapy but also to address SEL topics as a preventative approach to minimize the likelihood of pervasive negative impacts from communication disorders.

We recognize that SLPs, particularly in the school setting, have overwhelming caseloads and short sessions, thus making it difficult for them to add new therapy tools and practices. Recent research indicates that school-based SLPs may feel overextended and ineffective (Marante et al., 2023), particularly if they have lower job satisfaction and self-efficacy (Reed & Farquharson, 2024). It is likely that in order for SLPs to be open to adding new

things to their workload, it is important to first take something away to make room for the new thing (Curran, 2020; Farquharson et al., 2023). Because of these issues, SLPs may feel unsure about how to address SEL in addition to their students’ primary speech-language goals. It is our hope that the STIRS training helps SLPs consider natural ways to embed SEL topics within their routine speech-language therapy, rather than taking SEL topics on as a separate goal area.

Limitations and Future Directions

This was a pilot study representing a small sample from one local education agency in eastern Iowa. Future research on the STIRS program should include a larger and more diverse sample of SLPs.

We were also limited by the timeline and nature of the data collected. We only collected data from participating SLPs immediately before and after the 3-hr training regarding the proximal effects of the training on SLPs’ experiences. Future work should consider collecting follow-up data on proximal effects on SLPs as well as distal effects on student outcomes. Measuring proximal effects of SLPs’ attitudes, knowledge, and self-efficacy about addressing the social-emotional needs of their students after they have had time to try implementing the SEL practices would grant better insight into the real-world effectiveness of the approach. It could also be beneficial to include measures of behavioral implementation to assess whether SLPs actually apply what they learned, as well as measures of relational quality to assess changes in how SLPs interact with students, families, and school staff. These data could be bolstered by examining distal effects on students’ social-emotional functioning via the Strengths and Difficulties Questionnaire (Goodman, 1997), children’s communication attitudes using the Speech Participation and Activity Assessment of Children (McLeod, 2004), and children’s engagement in therapy sessions and in the classroom.

We also recognize that the potential impact of this training was limited by the singular nature of the training. It is naïve to assume that a one-time, 3-hr training would fundamentally change how SLPs do therapy with their students. Sustainable change could be enhanced with a more supportive model that directly scaffolds implementation such as through embedding peer learning and mentor support. These types of approaches could include more routine, frequent contact following the training to solve barriers to implementation that likely exist at the level of individual SLPs (e.g., limited time to implement new practices, perceived mismatch between SEL practices and role expectations), inner setting (e.g., limited SEL culture in the school system, communication silos between SLPs and

teachers), and outer setting (e.g., district-level initiatives that conflict with SEL practices, policies that prioritize academic goals). Collaborating with colleagues and mentors who work in the same organizational system would better support practical solutions to implementation barriers.

Conclusions

In this pilot RCT, we examined the preliminary effects of the one-time STIRS training on SLPs' willingness and confidence to support the SEL of K–3 students with communication disorders. The results show promise for this training in increasing SLPs' openness, knowledge, and self-efficacy in supporting specifically the self-awareness and self-management of their students and that the one-time STIRS training was appropriate, acceptable, and feasible. These encouraging findings lay the foundation for a future definitive trial with a larger sample and enhanced engagement through more clinical application training and team-based coaching. Overall, this work has the potential to promote more holistic approaches to supporting children who face everyday challenges with communication.

Data Availability Statement

The data set generated and analyzed during the current study is available in the OSF repository (<https://osf.io/qaxh7/>).

Acknowledgments

The research reported in this article was supported by a School Mental Health Grant from the Scanlan Center for School Mental Health (Principal Investigator: N. H. Rodgers), which is funded by the Iowa Department of Education. The opinions expressed are those of the authors and do not represent views of the Center or the Iowa Department of Education. We thank Jennifer Taps Richards for contributing to the content of the social-emotional learning (SEL) training and for delivering the hybrid SEL training to the speech-language pathologists (SLPs) in the treatment group, and to Dr. Jane McCormack, Nina Reeves, and Emily Rubin for their expert feedback on our training materials. We also thank Wendy Fick who assisted with managing the project and data, as well as Hannah Greene, a graduate research assistant in the Iowa Stuttering Lab, who assisted with content development for the trainings. We are grateful for the SLPs who participated in this project, with special thanks to Abbie Keibler and Madeline Grothus for being receptive to this research–practice partnership.

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T1 and T2 surveys included the following items (1–23)

The following questions ask about your feelings about using new types of social–emotional practices. Indicate the extent to which you agree with each item using the following statements on a 1–5 scale (1 = Not at all, 5 = To a very great extent).

1. I like to use social–emotional practices to help my students.
2. I am willing to try new types of social–emotional practices even if I have to follow specific steps.
3. I am willing to use new and different types of social–emotional practices developed by researchers.
4. I would try social–emotional practices even if it were very different than what I am used to doing.
5. I would adopt social–emotional practices if my students would benefit from it.
6. I would adopt social–emotional practices if I knew more about how my students liked it.
7. I would adopt social–emotional practices if I knew they were right for my students.
8. I would adopt social–emotional practices if they fit with my professional approach.
9. I would adopt social–emotional practices if they fit with my philosophy as a speech-language pathologist.
10. Implementing social–emotional practices prevents me from meeting my other obligations.
11. I know how to fit delivery of social–emotional practices into my current clinical practice.
12. Implementing social–emotional practices will cause too much burden on me.
13. If you received training in social–emotional practices that were new to you, how likely would you be to adopt it if:
 - a. they were intuitively appealing?
 - b. they “made sense” to you?
 - c. they were being used by respected colleagues who were happy with it?
 - d. you felt you had enough training to use them correctly?

The following questions ask about your knowledge about social–emotional practices. Indicate the extent to which you agree with each item using the following statements on a 1–6 scale (1 = Strongly disagree, 6 = Strongly agree).

14. I know how social–emotional learning can be a tool for building resilience in K–3 students with communication disorders.
15. I am knowledgeable about **self-awareness** in social–emotional learning.
16. I am knowledgeable about **self-management** in social–emotional learning.
17. I know where to access evidence-based resources to support students’ social–emotional competency.
18. I know what strategies are effective for supporting social–emotional competency of students with communication disorders.

The following questions ask about your confidence in addressing social–emotional needs of your students. Indicate the extent to which you agree with each item using the following statements on a 1–6 scale (1 = Strongly disagree, 6 = Strongly agree).

19. I am confident in my ability to support the social–emotional competence of my K–3 students.
20. I am confident that I can make a thorough plan for working with K–3 students that need social–emotional support.
21. I am confident that I can effectively integrate both self-awareness and self-management strategies into therapy with my K–3 students.
22. I am confident that I can address the unique social–emotional difficulties of my clients.
23. Cultivating the social–emotional competence in my student feels achievable.

T2 surveys included the following items (24–35) in addition to all previous items

*The following questions ask about how **acceptable** you found this training. Indicate the extent to which you agree with each item using the following statements on a 1–6 scale (1 = Completely disagree, 6 = Completely agree).*

- 24. The content of this training meets my approval.
- 25. The content of this training is appealing to me.
- 26. I like the content of this training.
- 27. I welcome the content of this training.

*The following questions ask about how **appropriate** you found this training. Indicate the extent to which you agree with each item using the following statements on a 1–6 scale (1 = Completely disagree, 6 = Completely agree).*

- 28. The content of this training seems fitting.
- 29. The content of this training seems suitable.
- 30. The content of this training seems applicable.
- 31. The content of this training seems like a good match.

*The following questions ask about how **feasible** you found this training. Indicate the extent to which you agree with each item using the following statements on a 1–6 scale (1 = Completely disagree, 6 = Completely agree).*

- 32. The content of this training seems implementable.
 - 33. The content of this training seems possible.
 - 34. The content of this training seems doable.
 - 35. The content of this training seems easy to use.
-

Appendix B (p. 1 of 2)

CONSORT 2010 Checklist of Information to Include When Reporting a Pilot or Feasibility Trial*

Section/Topic	Item No	Checklist item	Reported on page No
Title and abstract			
	1a	Identification as a pilot or feasibility randomized trial in the title	1
	1b	Structured summary of pilot trial design, methods, results, and conclusions (for specific guidance see CONSORT abstract extension for pilot trials)	1
Introduction			
Background and objectives	2a	Scientific background and explanation of rationale for future definitive trial, and reasons for randomized pilot trial	2–3
	2b	Specific objectives or research questions for pilot trials	3–4
Methods			
Trial design	3a	Description of pilot trial design (such as parallel, factorial) including allocation ratio	4
	3b	Important changes to methods after pilot trial commencement (such as eligibility criteria), with reasons	N/A
Participants	4a	Eligibility criteria for participants	5
	4b	Settings and locations where the data were collected	5
	4c	How participants were identified and consented	5
Interventions	5	The interventions for each group with sufficient details to allow replication, including how and when they were actually administered	5–7
Outcomes	6a	Completely defined prespecified assessments or measurements to address each pilot trial objective specified in 2b, including how and when they were assessed	7
	6b	Any changes to pilot trial assessments or measurements after the pilot trial commenced, with reasons	N/A
	6c	If applicable, prespecified criteria used to judge whether, or how, to proceed with future definitive trial	N/A
Sample size	7a	Rationale for numbers in the pilot trial	8
	7b	When applicable, explanation of any interim analyses and stopping guidelines	N/A
Randomization:			
Sequence generation	8a	Method used to generate the random allocation sequence	5
	8b	Type of randomization(s); details of any restriction (such as blocking and block size)	5
Allocation concealment mechanism	9	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned	5
Implementation	10	Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions	5
Blinding	11a	If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes) and how	5
	11b	If relevant, description of the similarity of interventions	7
Statistical methods	12	Methods used to address each pilot trial objective whether qualitative or quantitative	8

(table continues)

Appendix B (p. 2 of 2)

CONSORT 2010 Checklist of Information to Include When Reporting a Pilot or Feasibility Trial*

Section/Topic	Item No	Checklist item	Reported on page No
Results			
Participant flow (a diagram is strongly recommended)	13a	For each group, the numbers of participants who were approached and/or assessed for eligibility, randomly assigned, received intended treatment, and were assessed for each objective	Figure 1
	13b	For each group, losses and exclusions after randomization, together with reasons	Figure 1
Recruitment	14a	Dates defining the periods of recruitment and follow-up	5
	14b	Why the pilot trial ended or was stopped	5
Baseline data	15	A table showing baseline demographic and clinical characteristics for each group	Table 1
Numbers analyzed	16	For each objective, number of participants (denominator) included in each analysis. If relevant, these numbers should be by randomized group	Figure 1
Outcomes and estimation	17	For each objective, results including expressions of uncertainty (such as 95% confidence interval) for any estimates. If relevant, these results should be by randomized group	Table 3
Ancillary analyses	18	Results of any other analyses performed that could be used to inform the future definitive trial	8–9
Harms	19	All important harms or unintended effects in each group (for specific guidance see CONSORT for harms)	N/A
	19a	If relevant, other important unintended consequences	
Discussion			
Limitations	20	Pilot trial limitations, addressing sources of potential bias and remaining uncertainty about feasibility	12–13
Generalizability	21	Generalizability (applicability) of pilot trial methods and findings to future definitive trial and other studies	12–13
Interpretation	22	Interpretation consistent with pilot trial objectives and findings, balancing potential benefits and harms, and considering other relevant evidence	11
	22a	Implications for progression from pilot to future definitive trial, including any proposed amendments	12–13
Other information			
Registration	23	Registration number for pilot trial and name of trial registry	None
Protocol	24	Where the pilot trial protocol can be accessed, if available	None
Funding	25	Sources of funding and other support (such as supply of drugs), role of funders	13
	26	Ethical approval or approval by research review committee, confirmed with reference number	4

Note. Citation: Eldridge SM, Chan CL, Campbell MJ, Bond CM, Hopewell S, Thabane L, et al. CONSORT 2010 statement: Extension to randomised pilot and feasibility trials. *BMJ*. 2016;355. This is an Open Access article distributed in accordance with the terms of the Creative Commons Attribution (CC BY 3.0) license (<http://creativecommons.org/licenses/by/3.0/>), which permits others to distribute, remix, adapt, and build upon this work, for commercial use, provided the original work is properly cited.

*We strongly recommend reading this statement in conjunction with the CONSORT 2010, extension to randomized pilot and feasibility trials, Explanation and Elaboration for important clarifications on all the items. If relevant, we also recommend reading CONSORT extensions for cluster randomized trials, non-inferiority and equivalence trials, non-pharmacological treatments, herbal interventions, and pragmatic trials. Additional extensions are forthcoming: For those and for up-to-date references relevant to this checklist, see <http://www.consort-statement.org>.