Behavior Analysis in Practice
https://doi.org/10.1007/s40617-023-00892-z

SI: TRAUMA-INFORMED PRACTICE IN BEHAVIOR ANALYSIS

Using the Preschool Life Skills Program to Support Skill Development for Children with Trauma Histories

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Accepted: 1 December 2023

Abstract

The Preschool Life Skills (PLS) program has a wealth of evidence demonstrating efficacy in remediating important social and learning-to-learn skill deficits in at-risk preschoolers. Those same skill deficits also are common in older children in foster or residential care, most of whom have experienced some sort of trauma or other adverse childhood events. This study sought to evaluate individualized PLS curricula for two boys with substantial trauma histories and demonstrate how the PLS program could be delivered within a trauma-informed framework. We delivered the program and evaluated skill acquisition in a one-to-one setting in a UK-based clinic, and asked caregivers to assess skills at home. Results showed that both boys acquired skills targeted in their individual curriculum, but maintenance was sometimes inconsistent. Social validity assessments suggested that both boys enjoyed the training but were less definitive about its overall benefits. Caregivers rated the program highly and reported skill improvements at home. We discuss the implications of these findings in terms of adapting the PLS program to children with trauma histories.

Keywords Preschool Life Skills · Childhood trauma · Trauma-informed care · Skill development · Behavioral skills training

For nearly 2 decades, the Preschool Life Skills (PLS) curriculum and teaching program has garnered evidence of promoting positive outcomes for young children (Fahmie & Luczynski, 2018; Luczynksi & Fahmie, 2017). The PLS program was developed in recognition that children in non-maternal care are at greater risk for a range of behavioral issues, including difficulties following instructions, tolerating delays to reinforcement, and engaging in prosocial behavior with adults and peers (Hanley et al., 2007). Drawing on the notion that teaching children how to appropriately request reinforcers (i.e., functional communication training; Carr & Durand, 1985), combined with teaching core social skills deemed essential by early educators, would set young children on a more positive social and academic trajectory, the PLS program was designed to teach 13 critical skills and create evocative situations for children to practice those skills. Initial PLS studies were aimed primarily at typically developing preschoolers, but later investigations demonstrated generality to young children with a range of special education needs, including intellectual disabilities and autism (Falligant & Pence, 2017; Gunning et al., 2020; Robison et al., 2020). Further PLS expansions showed that parents could effectively deliver the PLS program (Gunning et al., 2020), and that it could be delivered in a tiered model with intensifying supports for children who failed to master skills during class-wide instruction (e.g., moving from group to one-to-one instruction; see Falligant & Pence, 2017; Robison et al., 2020). The program also has burgeoning support of cross-cultural applicability, having been used successfully in Ireland (Gunning et al., 2019, 2020) and Iceland (Ísfeld Víðisdóttir & Sveinbjörnsdóttir, 2021; Hálfdanardóttir et al., 2022).

Although the PLS program was developed primarily for at-risk preschoolers, similar skill deficits and behavioral issues often are observed in children who live in out-of-home care (e.g., foster or residential care). Relative to children in family care, children in out-of-home care are at greater risk for behavior problems, as well as a range of mental health issues (Turney & Wildeman, 2016). These

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Published online: 21 December 2023

children often have complex histories, marked by significant exposure to adverse childhood experiences (ACEs; Felitti et al., 1998), mental health issues (Engler et al., 2022), and instability of both care and living arrangements (Liming et al., 2021). As these children age, disruptions in home placements may lead to disrupted school placements, adding further instability to their already chaotic lives. Skill deficits in building attachments to caregivers, forming prosocial relationships with peers, and appropriately regulating emotions are well-documented (Palmieri & La Salle, 2017). It is understandable that these skill deficits may translate into behavior problems that may further jeopardize placement stability (Oosterman et al., 2007). Effective intervention to remediate these deficits is therefore critical. Although prior PLS studies might have included children with substantial histories of trauma (e.g., Hanley et al., 2014; Luczynski & Hanley, 2013), those demographic variables have not featured in the descriptions of participants. To our knowledge, no PLS studies to date specifically targeted children who have been identified by social services as having significant exposure to ACEs.

Although the PLS was designed as an early intervention program, many children are placed in care in late childhood or adolescence. According to the Annie E. Casey Foundation, up to 50% of children taken into foster care are older than 6 years of age. To date, most PLS research has justifiably focused on children between the ages of 3 and 5, with evaluations with developmentally disabled children occasionally using older participants and requiring some adaptations to delivering instruction (Falligant & Pence, 2017; Robison et al., 2020; Ruppel et al., 2021). Given the correspondence in behavioral issues among at-risk preschoolers and children in foster care, the PLS may also prove a useful framework for remediating skill deficits for older children in out-of-home care. However, adaptations may be needed to fit the context in which therapeutic services are typically delivered to these types of children. Services for children with complex trauma histories are more likely to be delivered in clinic settings where, compared to PLS applications in schools, less time may be available for working on skills and group therapeutic contexts are less common. Evaluating the effects of a more individualized but lower dosage PLS program, which could be more easily integrated into a child's existing therapeutic services, is warranted.

In addition to the correspondence between skill deficits of at-risk preschoolers and children in foster or residential care, there might be additional compelling reasons to evaluate the PLS as an intervention for children with trauma histories. In a recent study, Rajaraman et al. (2022) delineated trauma-informed care (TIC) commitments across a range of literatures and then operationalized those commitments from a behavior analytic perspective. Those commitments included acknowledging trauma and its impact, ensuring safety and trust, promoting choice and shared governance, and building skills. As a skill-building approach, the PLS program easily meets that commitment. However, other TIC commitments can be easily integrated into the program. For example, ensuring that the program is led by someone with whom the child feels secure, as well as giving children a choice to participate and weigh in on the importance of skill targets, can further align the program with a TIC approach. It is interesting to note that, despite its focus on developing socially important skills, the inclusion of children's perceptions has been notably absent across the PLS literature. To date, social validity assessments (Wolf, 1978) have focused almost exclusively on the perceptions of teachers, school administrators, or parents. To our knowledge, only two PLS studies (Gunning et al., 2019, 2020) have included social validity assessments with children, despite all PLS studies involving children capable of commenting on at least some aspects of the social validity of the program to which they were exposed. Evaluating children's perceptions of the importance of skills targeted, acceptability of procedures used, and satisfaction with outcomes may reveal additional information regarding necessary adaptations to the program, as well as helping PLS applications meet the TIC commitment of shared governance.

Research indicating that the teaching procedures can be implemented with integrity by caregivers (Gunning et al., 2020) also provides a compelling argument for using the PLS in foster and adoptive care. Given that caregivers often report a lack of training on managing and responding to children's mental health needs, including challenging behavior (e.g., Barnett et al., 2018; Murray et al., 2011), it is possible that offering parents a more proactive, skills-based approach might effectively address this need. Involving caregivers in the delivery and evaluation of the PLS program might help assess its suitability in addressing caregiver needs.

The purpose of the current study was to explore the effectiveness of an individualized PLS curriculum for children identified by social services as having experienced multiple and persistent ACEs, but who were older than children typically targeted in PLS evaluations. In addition to evaluating children's skill acquisition when working one-to-one with a therapist in a clinic setting, we also trained parents to practice the skills at home to promote generalization. Further, we sought to determine whether procedural adaptations might be required to maximize program effectiveness, as well as whether methodological adaptations might be needed to more accurately capture those effects. We also aimed to address the social validity gap in the PLS literature by including children in social validity assessments. Finally, we aimed to add to existing demonstrations of the cultural adaptability of the PLS program outside the United States by implementing procedures in a UK setting.

Method

Participants

Two boys took part in the study. Both children were neurotypically developing but displayed frequent challenging behavior, including verbal aggression (e.g., shouting, swearing), physical aggression (e.g., hitting, kicking, punching others), and noncompliance. Review of the children's social services documents suggested skill deficits in emotional understanding and forming attachments with caregivers. Gethin was 12 years old and on a child-protection register with the local authority's social services for the previous 4 years due to evidence of neglect and concerns about his parents' ability to care for him. These concerns led to a shared-care agreement whereby Gethin and his older brother spent 4 nights per week living with their birth parents and 3 nights per week with grandparents. Gethin and his parents were referred for behavioral services following social services' recommendation for the siblings to receive direct therapeutic support, and for their parents to receive support with managing challenging behavior incidents and establishing clear structure, routines, and boundaries at home. Gethin's parents also participated in PLS parent workshops (see below). Hari was 9 years old and was living in a foster care placement (with two foster parents) at the time of the study. He had been placed in foster care at 6 years of age after social services deemed his parents unable to meet his needs and those of his three siblings due to their own mental health issues, domestic violence between parents, and evidence of child neglect that resulted in Hari frequently caring for his younger siblings. Hari had experienced five placement moves across his 3 years in foster care, with the most recent being 2 months prior to taking part in the study. Hari was referred for behavioral services to support with the transition to his new placement and consultation support for his foster parents to manage the emotional and behavioral challenges Hari presented.

As both participants had substantial histories with social services, the first author (who served as the primary therapist) had access to information gathered by other professionals, including social workers and psychologists. Documents included court bundles, psychological assessments, chronologies of events compiled by social workers, and police incident reports. Therefore, no additional trauma screening procedures were deemed necessary. Standard information-gathering procedures at the clinic where the study took place included conducting informant assessments with current social workers and caregivers to obtain information about current skill deficits and behavior challenges, as well as the environmental contexts in which those challenges were more or less likely to occur. Services for all children who attended the clinic, including the two participants, were arranged through multidisciplinary collaboration among a team of professionals. PLS sessions were delivered in addition to other therapies prescribed for the children by the multidisciplinary team, including but not limited to trauma-focused CBT and Therapeutic Life Story work.

Setting

Sessions took place at a clinic in South Wales (UK) that provided behavioral services to children in foster, residential, or adoptive care and their families. Each session lasted 1 hr and occurred 1 day per week for 15 weeks for Gethin and 12 weeks for Hari (differences in length of treatment were due to the number of skills taught for each child and time required to achieve mastery). The therapy room was approximately 4 meters by 3 meters and included a variety of toys and art materials, as well as a table and chairs and an open space for physical activities (e.g., darts, basketball hoop). All sessions were video recorded via built-in cameras in the therapy room. Sessions were attended by the child and one therapist, who was known to the child and remained consistent across sessions. Gethin's brother began attending sessions in week 3, as skills taught in those sessions required a peer's presence. Due to Hari's history of aggression, his social worker had recommended a placement where Hari was the only child in the home. She further advised that his sessions not be attended by a sibling or peer due to risks of aggression, so any skills requiring the presence of a peer were omitted from his curriculum.

Dependent Measures and Data Collection

Although sessions were video recorded, primary data collection took place in real-time using paper-and-pencil data sheets (videos were used for scoring interobserver agreement and procedural integrity). Pretreatment assessments were conducted to identify which skills would be included in each child's curriculum (see procedure below). For Gethin, dependent measures included 13 skills that were divided into four units; for Hari, data were collected across seven skills divided into three units (see Table 1). Hari was assessed on only 7 of the 13 skills due to a lack of a confederate peer (see setting). Probes were conducted to assess skills, whereby three evocative situations were presented for each skill being assessed. Each presentation of an evocative situation represented a trial and dependent measures were presented as percentages. For each evocative situation, a correct skill was scored when the participant engaged in the skill within 2–10s (dependent on the skill being taught) of the

Table 1 Description of PLS Units, Evocative Situations, Skills, and Performance Expectations

Gethin PLS Unit	Evocative Situation	Targeted Skill	PLS Expectation
Unit 1			
Instruction Following	Skill 1: Therapist calls child by their first name	Responding when name is called	Within 2 s, the child will stop competing behavior, orient toward the speaker, and say, "Yes"
	Skill 2: Therapist provides a single step instruction	Following instruction to tidy up	Within 3 s, the child will begin to complete the instruction in a timely manner
	Skill 3: Therapist provides a multi-step instruction	Following instruction to put item in cupboard and come and sit down	Within 3 s, the child will begin to complete the instruction in a timely manner
Unit 2			
Functional Communication	Skill 1: Difficult task, unpleasant or non-preferred situation	Requesting for help (worksheet presented)	The child will complete task or request assistance by saying, "Help me, please" within 45 s of instruction delivery
	Skill 2: Therapist or peer attention is diverted to a task or another person	Recruiting attention when therapist is setting up materials	The child will recruit attention by saying, "Excuse me" and without engaging in excessive physical contact (i.e., no more than 3 light taps)
	Skill 3: An area is blocked or a material is in use by the therapist	Recruiting attention from adult and requesting to gain access to an item	Within 10 s of approaching the therapist, the child will say "Excuse me" to gain the therapists attention, wait for a response, and then requests access to the area or material in the form of "May I _____."
	Skill 4: An area is blocked or a material is in use by peer	Recruiting attention from a peer and requesting to gain access to an item	Within 10 s of approaching a peer, the child will say "Excuse me" to gain the peers attention, wait for a response, and then requests access to the area or material in the form of "May I _____."
Unit 3			
Tolerance	Skill 1: Therapist tells a child they will have to wait for a requested material or event	Waiting when the therapist asks child to wait	The child will say "Okay," and wait patiently for 30-90 s
	Skill 2: Peer tells a child s/he will to wait for a requested material or event	Waiting when a peer asks participant to wait	The child will say "Okay," and wait patiently for 30-90 s
Unit 4			
Friendship	Skill 1: Upon receiving something from another person	Saying thank you	Within 5 s of receiving an item from someone, the child will orient to the therapist and say, "Thank you"
	Skill 2: Peer enters the classroom or a play group	Greeting and saying hello	Within 10 s of someone entering the room, the child will greet ("Hello") and/or compliment (e.g. "I like your shirt") the newcomer
	Skill 3: Peer is without toys or activity materials	Offering for a peer to join a game or play with a toy	
	Skill 4: Another person shows signs of pain or distress	Asking if someone is okay when another is distressed	Within 10 s of the arrival of another person, the child will offer some of the toys or materials within reach
			Within 10 s of an event, the child will approach the victim and ask, "Are you okay?"

Table 1 (continued)

Hari			
PLS Unit	Evocative Situation	Targeted Skill	PLS Expectation
Unit 1			
Instruction Following	Skill 1: Therapist calls child by their first name	Responding when name is called	Within 2 s, the child will stop competing behavior, orient toward the speaker, and say, "Yes".
	Skill 2: Therapist provides a single step instruction	Following instruction to sit down	Within 3 s, the child will begin to complete the instruction in a timely manner
	Skill 3: Therapist provides a multi-step instruction	Following instruction to pick up (item) and put in the bin	Within 3 s, the child will begin to complete the instruction in a timely manner
Unit 2			
Functional Communication	Skill 1: Difficult task, unpleasant or non-preferred situation	Requesting for help (difficult task or activity)	The child will complete task or request assistance by saying, "Help me, please" within 45 s of instruction delivery
	Skill 2: Therapist or peer attention is diverted to a task or another person	Recruiting attention when therapist is facing away from the child	The child will recruit attention by saying, "Excuse me" and without engaging in excessive physical contact (i.e., no more than 3 light taps)
			Within 10 s of approaching the therapist, the child will say "Excuse me" to gain the therapists attention, wait for a response, and then requests access to the area or material in the form of "May I _____."
Unit 3			
Tolerance	Skill 1: Therapist tells a child they will have to wait for a requested material or event	Waiting when the therapist asks child to wait	The child will say "Okay," and wait patiently for 30-90 s

evocative situation being presented. An error of omission was scored when the participant responded incorrectly or did not respond, and an error of commission was scored when the participant engaged in one or more problem behaviors as defined by Hanley et al. (2007). Given the range of behavioral issues displayed by participants, we used a more lenient scoring system than prior PLS evaluations to capture skill acquisition. In particular, correct skills and errors of commission were not mutually exclusive, as it was sometimes possible for a participant to engage in the correct skill while also engaging in a problem behavior (e.g., attending to name while simultaneously pushing a sibling out of the way). Responses were converted to percentages by dividing the number of responses in each category by the number of evocative events for the targeted skill.

Interobserver Agreement

Interobserver agreement was collected for 54% of probes for Gethin and 56% of probes for Hari. The second rater scored dependent measures from the recordings and then compared their scores to those of the primary observer. An agreement was scored when the two observers scored the same response categories (i.e., preschool life skill, error of commission or omission) for the same evocative event. Interobserver agreement scores were calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100 to generate a percentage. For Gethin, mean IOA was 91% (range: 79%–100%). For Hari, mean IOA was 92% (range: 78%–100%).

Indirect Measures

Prior to the first baseline session and at the conclusion of the study, Gethin's parents and Hari's foster parents were given a 13-item questionnaire (Hanley et al., 2007) to assess the likelihood of each targeted skill occurring in common evocative situations, as well as to report problem behavior that might occur in the presence of those situations. Responses were converted to a percentage of situations in which Preschool Life Skills were more likely to occur relative to problem behavior. Caregiver responses also informed the design of evocative situations for sessions (e.g., if a caregiver reported problem behavior in the presence of a command to tidy up, we included that command when teaching following instructions).

Procedure

Preteaching Assessments

To establish individualized curricula, each participant attended three initial assessment sessions that lasted approximately 1 hr each. During these sessions, a therapist arranged three evocative situations for participants to emit each PLS skill across all units. Evocative situations for each skill were interspersed across the session. Any skills for which the child did not engage correctly across all opportunities were added to the child's curriculum. Table 1 shows the skills targeted for each participant's individualized curriculum. Given the time constraints on teaching sessions (i.e., 1 hr per week), some skills were taught and assessed under a specific (rather than varied) evocative situation, particularly if the caregiver had identified an evocative situation that was particularly important in their household. This occurred primarily for instruction following.

Baseline

Baseline data collection began during the first session following the completion of the initial assessment sessions and targeted only those skills in the participant's individualized PLS curriculum. Like the initial assessment, baseline probes for the skills in each unit included three evocative situations for each skill. Evocative situations were again interspersed across the session. During baseline sessions, the therapist did not program consequences for correct skills or errors. However, to maintain rapport during the session, the therapist sometimes provided a nonevaluative statement such as "Okay" or "Let's do something else now."

PLS Teaching

At the start of each teaching session, participants were allowed to play with activities of their choice for 5–10 min. The plan for the session was then shared with the participants, outlining which skills they would be learning and practicing during the session (each session typically targeted 3–4 skills). Participants were asked if they thought the plan sounded okay and were reminded that they could leave at any time by telling the therapist. Neither child ever said they disagreed with the session plan, nor did they ever leave a session early.

Behavioral skills training (BST; instruction, modeling, role play, and feedback) was used to teach each skill. For each skill, the BST process lasted 5–10 min, depending on the complexity of the skill. After reviewing the session plan with the child, the therapist explained the first skill being taught for that session and why that skill was important. The child was encouraged to also provide reasons why the skill was important. After explaining the skill, the therapist modeled the skill and asked the child to imitate it. If the child imitated the skill correctly the therapist provided descriptive praise (e.g., "well done for waiting"). Consistent with previous PLS studies (Hanley et al., 2007; Gunning et al., 2020), no additional consequences were provided following

correct responses. If the child did not imitate the skill correctly, the therapist provided corrective verbal feedback, modeled the skill again, and presented a second evocative situation. If the child failed to imitate the skill or engaged in problem behavior that was incompatible with the skill on the second try, the therapist moved to the next skill targeted for the session and returned to the incorrectly performed skill later in the session. Training for the remaining skills in the unit continued in the same manner. Once BST produced a correct response, evocative situations for each skill were interspersed across the 60-min session until mastery was achieved. Mastery of a skill was defined as achieving either three consecutive correct responses or five correct responses in total in a session (Hanley et al., 2007). If mastery of a skill was not achieved in a single session, the skill was added to the curriculum for the subsequent session. Teaching sessions for each unit continued until mastery was achieved for every skill. Table 1 depicts example evocative situations, targeted skills, and performance requirements for each participant's curriculum.

Postteaching Probes

Postteaching probes were conducted 1 week following the teaching of each unit. Probes were conducted in identical fashion to those in pretreatment assessments and baseline and assessed all skills within each learner's respective PLS curriculum (i.e., Units 1–4 for Gethin, Units 1–3 for Hari).

Research Design

The effects of PLS training on correct skills and errors of commission were assessed using a multiple-probe design across PLS units. This involved teaching each unit sequentially, one unit at a time, until mastery was achieved for all skills within that unit. Skills were assessed prior to and following the teaching of each PLS unit to evaluate the effects of teaching. Probes were conducted across all skills and all units included within individualized curricula (see Table 1).

Generalization

At the start of the study, the therapist reviewed the PLS curriculum and asked caregivers to select one skill from each unit that they found particularly problematic. They were then provided bespoke data sheets to record the occurrence or nonoccurrence of the skill during naturally occurring evocative situations at home or in the community. Gethin's parents chose following one step instructions, recruiting attention appropriately, waiting, and greeting another person appropriately as the most important skills. Hari's foster parents chose following multistep instructions, asking for help, and waiting as the most important skills. Parent-collected data were converted to a percentage of correct skills by dividing the number of correct skills by the number of evocative situations. Only Gethin's parents submitted generalization data.

Caregiver Training Workshops

Four caregiver PLS training workshops were arranged to coincide with the teaching of each PLS unit and commenced after the child had completed the first teaching session. As caregivers had access to more comprehensive training as part of clinic service provision, workshops focused specifically on teaching them how to practice PLS skills at home. Sessions included conversations about the types of situations in which practicing the caregiver-selected skill would be most important and how to contrive evocative situations for that skill, as well as role plays to show how BST could be used to teach the skill. Workshops were conducted in the conference room of the clinic and each session lasted approximately 1 hr. Use of terminology and pace of instruction was calibrated to the caregiver's level of education and understanding.

Gethin's parents attended four training sessions (both parents attended workshops 1 and 2, and Gethin's father attended workshops 3 and 4). Hari's foster parents were unable to attend workshop sessions due to recent bereavements in their family and instead were debriefed following each teaching session. Debriefs included a description of the skills covered in the session, confirmation of the skill they had selected as most important for that unit, a request to try to practice skills at home and to collect data, and time for the caregivers to ask questions. The therapist contacted both sets of caregivers by phone or text at least once weekly during the training phase to remind parents to practice skills at home and to troubleshoot any problems.

Procedural Integrity

An independent observer scored 78% of teaching sessions for procedural integrity by viewing videos of the sessions. Procedural integrity was scored trial-by-trial on a 7–8 item checklist that was derived from the teaching protocol (some units included more items due to the inclusion of a sibling). The checklist included such items as whether the therapist discussed the skill with the child when introducing the skill, whether the correct evocative situation was arranged, whether the correct consequence was delivered for the child's response, and whether the therapist moved on to another skill if error correction did not produce a correct skill on two consecutive attempts. For each session, the integrity score was calculated by dividing the number of steps correctly completed by the number of steps on the checklist across trials. For Gethin, the mean treatment integrity score was 99% (range: 93%–100%). For Hari, the mean treatment integrity score was 95% (range: 90%–100%).

Social Validity

Social validity was formally assessed at the end of the study, although presession conversations were intended to informally assess relevance of goals and treatment acceptability. Both participants completed a five-item questionnaire with a 3-point scale (agree, not sure, disagree) for each statement (Alan & Kabasakal, 2020). Gethin's sibling completed a similar questionnaire with seven items. The children were asked about whether they enjoyed the sessions, if the time was sufficient to learn the skills, and if they thought the skills were important. Parents and foster parents were asked to complete questionnaires with a 7-point Likert scale (1 = strongly disagree; 7 = strongly agree). Caregivers were asked to respond to statements about the teaching their children received, whether they could continue teaching at home, whether behavior generalized to home, and (if appropriate) the feasibility of data-collection. Because Hari's foster parents did not attend the caregiver workshops, the questionnaire they completed omitted questions related to those sessions.

Debrief

We engaged in active, two-way debriefing throughout the teaching process for both the children and their caregivers by reviewing unit goals, candidly explaining how we would teach and assess skills during sessions, and encouraging participant feedback during the process. After training for each child had concluded, the therapist reviewed the child's graph with the caregiver and explained which skills appeared to have maintained and which might still need work, as well as allowing the caregiver to share their perceptions of skill attainment. The therapist also reviewed strategies for teaching and practicing at home. Children received verbal information and praise about the skills they did particularly well on (those that maintained at higher levels), as well as those skills that needed more practice, and were allowed to ask questions or express views not captured by the social validity assessments.

Results

To meet the mastery criterion across all skills, Gethin required eight teaching sessions and Hari required six (i.e., approximately two sessions per unit). For Gethin, mean trials to criterion for each skill was five (range: 3–11). For Hari, mean trials to criterion were four (range: 3–9). For both participants, skills in Unit 2 (Functional Communication) required the most teaching to achieve mastery. Skills that required the greatest number of trials for Gethin and Hari were requesting an item from a peer and asking for help, respectively.

Direct Measures

The percentage of trials across which Preschool Life Skills and errors of commission occurred are displayed in Fig. 1 for Gethin and Fig. 2 for Hari (errors of omission are not plotted, as they are the inverse of the percentage of skills demonstrated). Within each figure, tiers represent PLS teaching units and vertical bars represent a discrete skill within each unit (see Table 1). Bars above the horizontal axis represent the percentage of trials in which each discrete skill was displayed, whereas those below represent percentage of trials in which errors of commission occurred for each of these skills.

Across Unit 1 (Instruction Following), Gethin (Figure 1, top panel) demonstrated relevant skills across 33% of all opportunities in baseline, with no errors of commission. Immediately following teaching, he engaged in instruction following skills across 100% of all trials, although errors of commission occurred across 33% of trials for Skill 1 (responding to name). Subsequent probes showed that overall Unit 1 performance was somewhat variable (70% of probes), but all skills other than Skill 2 (appropriately recruiting attention from an adult) consistently remained above baseline levels. Errors of commission were only observed in the penultimate probe session, occurring in 33% of probes for each of the three skills.

For Unit 2 (Functional Communication; Figure 1, second panel), Gethin demonstrated relevant preschool life skills in 8% of all opportunities for all four skills across the two baseline probes. Errors of commission occurred when probing Skill 1 (requesting for help) and Skill 2 (recruiting attention for a distracted adult) during the second baseline probe. Across all Unit 2 baseline probes, Gethin engaged in errors of commission across 8% of trials. Functional communication skills improved immediately postteaching, occurring across 72% of opportunities. Errors of commission were observed in 33% of probes of Skill 4 (recruiting attention from a peer and requesting access to an item) but remained relatively low across probes. With the exception of Skill 2 in the second postteaching probe, all Unit 2 skills remained above baseline levels in all subsequent probes, with most skills maintaining 100% accuracy.

During baseline probes for the two Unit 3 skills (Tolerance; Figure 1, third panel), Gethin correctly engaged in skills across 39% of opportunities. Errors of commission were observed in 100% of probes of Skill 2 (waiting when a peer requests it) in the third baseline probe, though Gethin also demonstrated the skill in these trials. Immediately following teaching, correct engagement in Unit 3 skills occurred across 67% of opportunities, with no errors

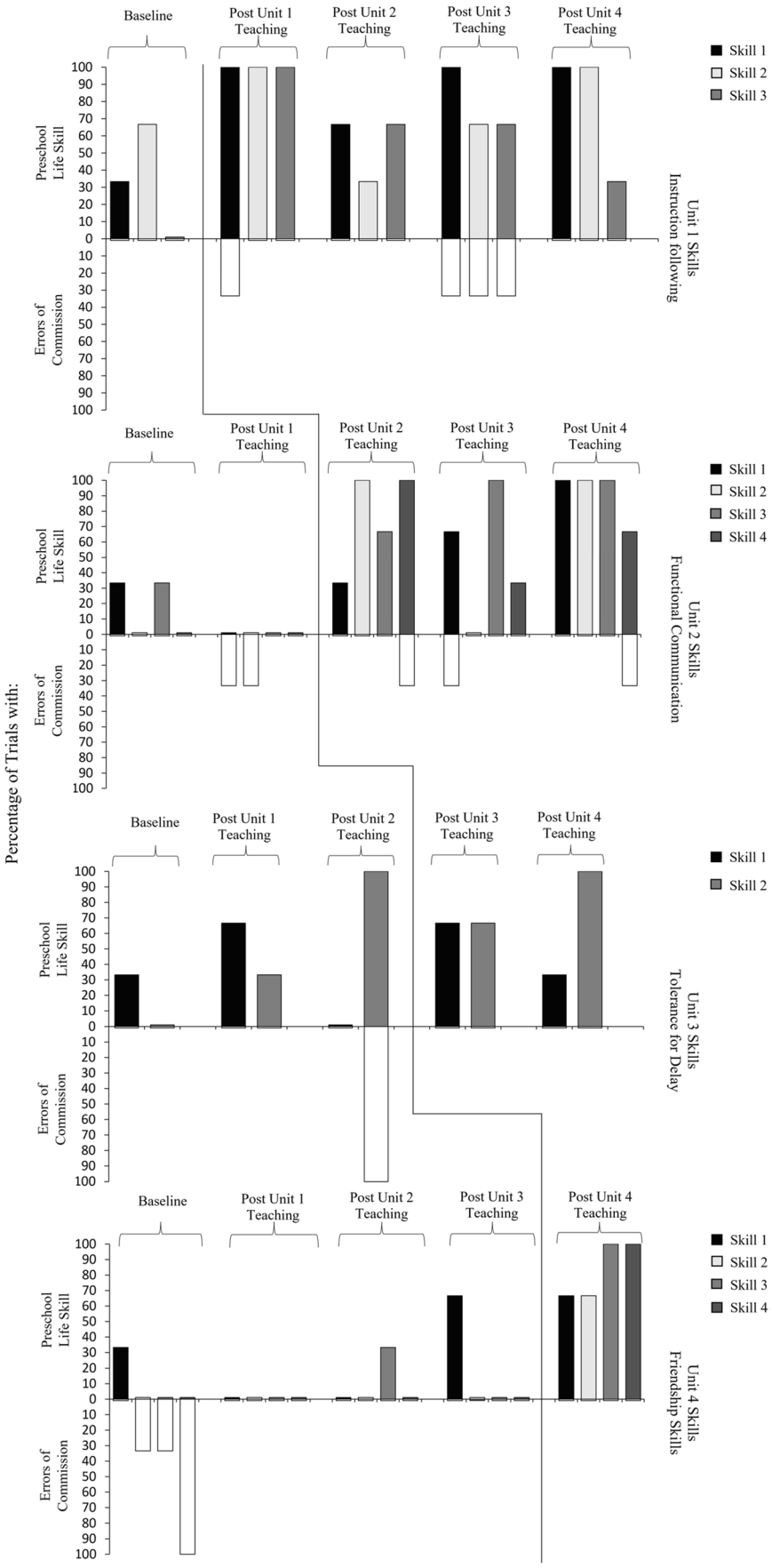

Fig. 1 The Percentage of Preschool Life Skills (bars above the horizontal axis) and Errors of Commission (bars below the horizontal axis) across Units for Gethin. *Note.* The skills targeted within each unit are listed in Table 1

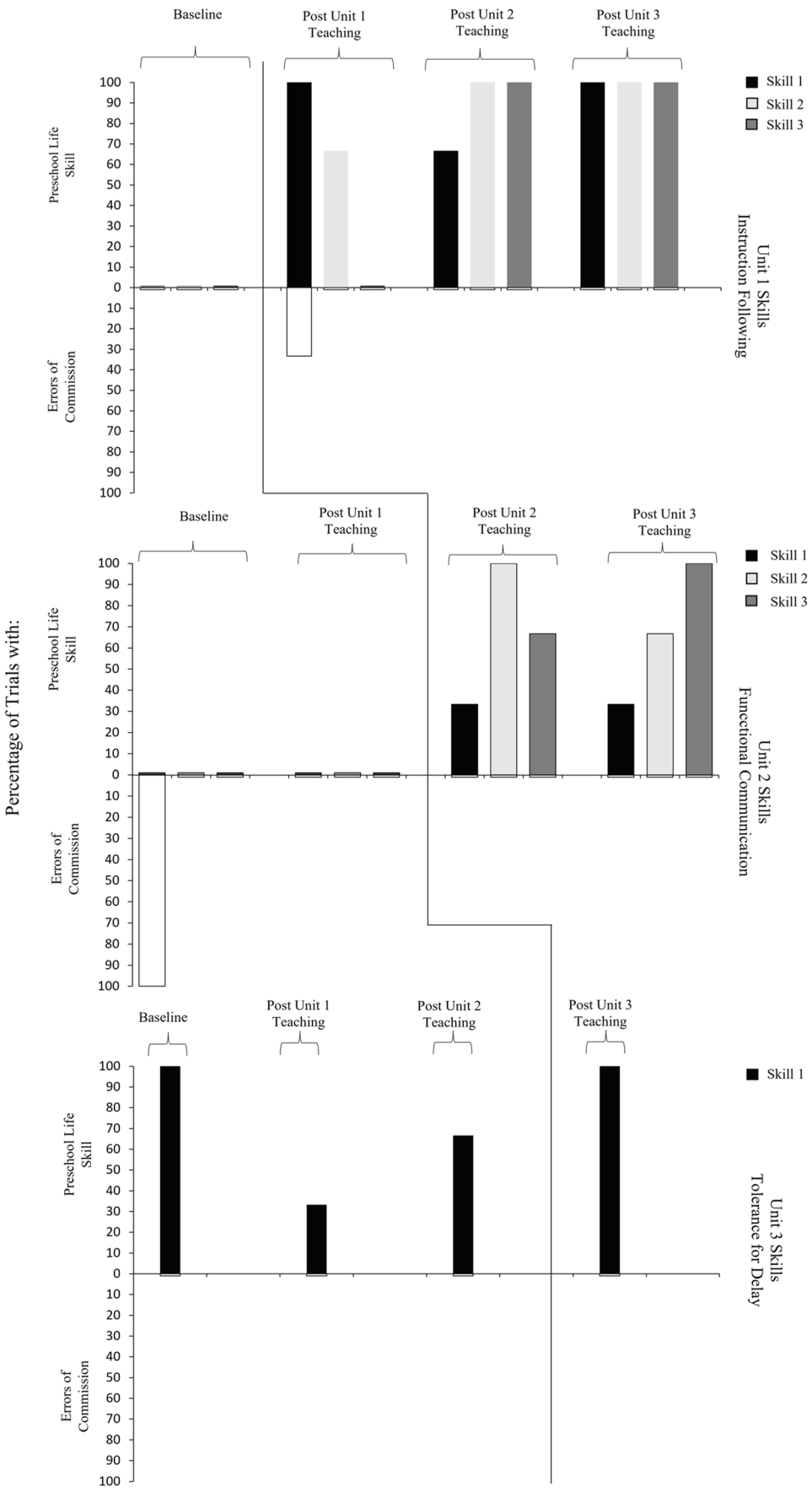

Fig. 2 The Percentage of Preschool Life Skills (bars above the horizontal axis) and Errors of Commission (bars below the horizontal axis) across Units for Hari. *Note*. The skills targeted within each unit are listed in Table 1

of commission. In the final probe, Gethin engaged in the Unit 3 skills across 67% of opportunities, with no errors of commission observed.

Across baseline probes for the three skills in Unit 4 (Friendship Skills; Figure 1, fourth panel), Gethin responded correctly across 8% of opportunities, with errors of commission occurring across 10% of probes (although all errors occurred during the first probe). Apart from Skill 1 (saying "thank you"), all Unit 4 skills were observed above baseline levels after teaching and no errors of commission occurred.

Hari (Figure 2, top panel) did not correctly engage in any of the three skills targeted for Unit 1 (Instruction Following) during baseline probes and did not engage in any errors of commission. Immediately following teaching, Hari displayed Unit 1 skills across 56% of opportunities, with only one error of commission across trials. Across subsequent probes (postteaching Unit 2 and 3), Hari engaged in these skills across 94% of opportunities with no errors of commission. Similar to Unit 1, Hari did not display any of the three targeted Unit 2 skills (Functional Communication; Figure 2, second panel) during baseline probes. Errors of commission were observed at baseline for Skill 1 in 100% of evocative situations (requesting help) but were not observed in probes thereafter. Immediately after teaching, Hari correctly engaged in Unit 3 skills in 50% of opportunities overall, with no errors of commission. Hari also correctly engaged in Unit 3 skills across 50% of opportunities in the subsequent probe, though his relative success given specific evocative situations (Skills 2 and 3) changed. Despite somewhat variable performance, all skills maintained above baseline levels.

Hari only had one skill in Unit 3 (Tolerance), which was waiting when asked by an adult. Despite not correctly engaging in this skill during preassessments, Hari responded correctly during the first baseline probe across 100% of evocative situations, with no errors of commission. Performance of the skill was variable in subsequent probes, being observed in 67% of probes conducted prior to the teaching of Unit 3. Postteaching, Hari again displayed 100% correct responding with no errors of commission.

Generalization

Figure 3 displays parent-collected data for the skills tracked at home for Gethin (as noted in the method, Hari's foster parents did not engage in home data collection). Baseline data showed that Gethin tidied up when asked (Unit 1) on 22% of opportunities. Directly following teaching, caregivers reported an increase, with Gethin tidying up when asked across 30% of trials. Recruiting adult attention appropriately (Unit 2) was observed in 17% of opportunities during baseline. After teaching, Gethin's foster parents reported that he appropriately recruited attention during 30% of opportunities. For the Unit 3 skill, caregivers reported that Gethin waited when asked during 6% of trials prior to the teaching of this unit. After teaching, he engaged in the behavior in 40% of opportunities. The skill targeted by

parents for Unit 4 was greeting others appropriately. Prior to the teaching of this unit, foster parents reported that he displayed this skill across 28% of trials. After teaching, Hari's foster parents reported that Hari greeted others appropriately over 40% of trials.

Indirect Measures

PLS questionnaire results suggested that Gethin's parents observed skills across 15% of evocative situations prior to teaching (i.e., 2 of the 13 skills). Postteaching, they reported observing skills across 54% of situations (i.e., 7 of the 13 skills). Hari's foster parents reported observing 77% of relevant skills prior to teaching (i.e., 10 skills), and 93% of skills postteaching (i.e., 12 skills).

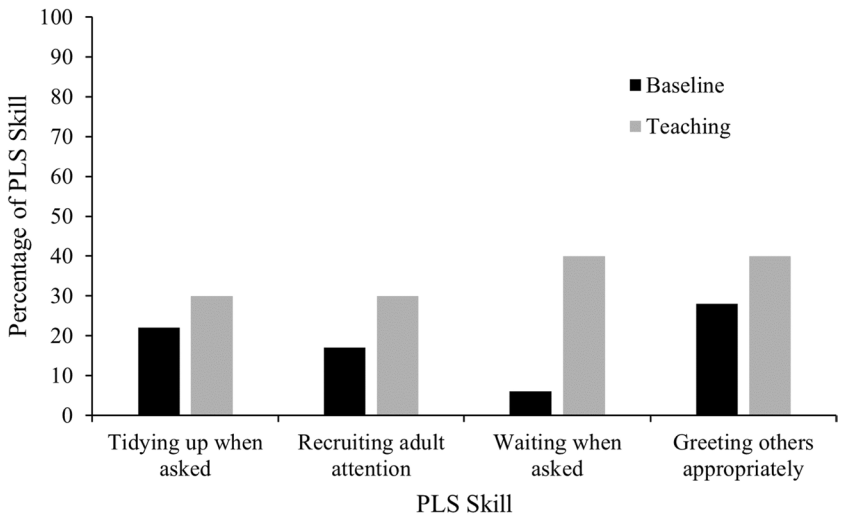

Fig. 3 Parent-Collected Data of Preschool Life Skills at Baseline and Postteaching in Naturally Occurring Evocative Situations at Home or in the Community for Gethin

Social Validity

Table 2 displays the results of the participants' social validity questionnaires. Both participants reported that they enjoyed participating in sessions but were less sure that they managed their own behavior better as a result. Both also disagreed that a 1-hr session per week was enough time to make progress. Hari reported he learned things when he attended sessions, but Gethin was less sure. Gethin's brother's responses to his social validity questionnaire are displayed in Table 3. He reported enjoying being part of the sessions and helping with tasks. Although he was not as sure that his brother needed practice on all the specific skills, he did agree that overall, his brother benefitted from attending.

Table 4 displays the results of the caregiver's social validity questionnaires, which was completed by one caregiver from each family. As Hari's foster parents did not attend training workshops, they did not answer questions relating to training (items 5–10). Both caregivers reported that they enjoyed coming to the clinic and that they would

Table 2 Results of Participants' Social Validity Questionnaires

Statement	Responses		
	Strongly Agree	Not Sure	Strongly Disagree
I enjoyed the program.	2	0	0
This program helped me manage my behaviors.	0	2	0
I enjoyed sessions when brother joined.	0	1	0
The weekly 1-hr session was enough time for me to make progress.	0	0	2
I learned something when I attended sessions.	1	1	0

Table 3 Results of Sibling's Social Validity Questionnaire

Statement	Responses		
	Strongly Agree	Not Sure	Strongly Disagree
I enjoyed being a part of sessions.	1	0	0
I enjoyed helping the therapist with the tasks in the session.	1	0	0
I understood what I needed to do in each session.	1	0	0
I feel that my brother needed to practice following instructions.	0	1	0
I feel that my brother needed practice asking for help from adults.	1	0	0
I feel that my brother/friend needed to practice learning to wait.	0	1	0
I feel that my brother needed to practice friendship skills.	0	1	0
I feel that my brother benefitted from coming to the sessions.	1	0	0

Table 4 Results of Parents' Social Validity Questionnaire

Statement	Responses						
	1	2	3	4	5	6	7
I enjoyed coming to the clinic.	2	0	0	0	0	0	0
My child's behavior improved at home.	1	0	0	0	1	0	0
My child learned the skills that were taught in session and at home.	1	0	0	0	1	0	0
I would recommend this program.	2	0	0	0	0	0	0
The therapist explained the suggested procedures clearly to implement at home.	1	0	0	0	0	0	0
The suggested procedures were easy to implement at home.	0	0	1	0	0	0	0
I will continue with the suggested strategies.	1	0	0	0	0	0	0
Procedures were easy to fit into everyday life.	0	0	1	0	0	0	0
The workshops were beneficial.	1	0	0	0	0	0	0
Data collection methods were easy to follow and to complete.	1	0	0	0	0	0	0

Note. 1 = Strongly agree, 2 = Agree, 3 = Somewhat agree, 4 = Not sure, 5 = Somewhat disagree, 6 = Disagree, 7 = Strongly disagree

recommend the program to others, but their responses regarding observed behavior changes at home were mixed, with Hari's foster parents tending to respond more favorably than Gethin's parents. When asked to comment further, Gethin's father explained that although they felt their child had learned the skills, he was less willing to display them outside the clinic setting. However, Gethin's parents reported that they found the workshops beneficial and would continue to incorporate the strategies at home, despite feeling that the procedures were somewhat difficult to incorporate into everyday life.

Discussion

A primary purpose of the current study was to explore the feasibility of an adapted PLS program for children identified by social services as having experienced multiple and persistent ACEs, and who were older than children typically targeted in the PLS literature. We sought to align PLS procedures with trauma-informed care commitments (Rajaraman et al., 2022), as well as evaluate the efficacy of a lower-intensity PLS curriculum that could be delivered within relatively short, clinic-based sessions. Table 5 summarizes the procedures we used to acknowledge trauma and its impact, establish safety and trust, promote choice and shared governance, and place our primary intervention focus on skill-building.

An equally important goal was to employ strategies that allowed us to include the children's voices in the evaluation of PLS procedures and outcomes. To date, only two other studies have recruited children's opinions of the PLS (i.e., Gunning et al., 2019, 2020). Results showed that both Gethin and Hari acquired the skills targeted in their individualized PLS curricula, although maintenance of those skills across sessions was sometimes inconsistent. These outcomes were reflected in the children's social validity assessments, which revealed that although they both enjoyed the sessions, they felt they needed longer sessions (or perhaps a greater number of sessions) to effectively make progress. These views might also be reflected in the fact that although Hari believed learning the skills helped him more effectively manage his behaviors, Gethin was less sure.

In addition to asking children about their satisfaction with the PLS process and outcomes at the end of the study, we invited their perspectives during the study to assist in validating the importance of the skills they were learning. We also gave children a choice about participating, allowing them to leave the sessions at will. Rajaraman et al. (2022) noted the importance of choice in enacting TIC procedures in behavior analytic service delivery, in addition to suggesting that measuring adjunctive behaviors during sessions (such as emotional behavior and attempts to leave) might provide indicators of the degree to which procedures avoided retraumatization and promoted shared governance. That neither of our participants opted to leave any session, combined with the observation that none of the errors of commission involved emotional responding, provides further evidence of the social validity of the procedures.

Another important goal of this study was to include caregivers in the PLS process. Each child's caregivers were asked to identify a skill from each unit that they felt was most important, and to evaluate their child's progress on that skill throughout the course of the study. To support this process, we offered training workshops to show parents how to teach the skills, how to identify or create evocative situations, and how to collect data on skill acquisition. Although we offered training to both pairs of caregivers, only Gethin's parents engaged with the workshops. Based

Table 5 Trauma-Informed Care (TIC) Commitments and Practices

TIC Commitments	TIC Practices
Acknowledge trauma and its impact	Use of existing trauma screening and reports to understand participant experiences
	Staff trained in trauma screening conducted informant assessments
	PLS curriculum individualized to participant needs
Ensuring safety and trust	Sessions delivered in a one-on-one, child-friendly space with a therapist with whom the child was familiar
	Time for child-directed play at the start of the session
	Active assent via option to leave sessions at any time and reminders of voluntary nature of participation
	Caregivers allowed to attend sessions if the child requested it
	Option for caregivers to engage in ways that fit their personal circumstances and time commitments
Promote choice and shared governance	Participants involved in defining the importance of skills being taught
	Choice to participate in sessions
	Caregivers asked to identify skills that were most important to them
	Social validity assessed for participants, siblings, and caregivers
Focus on skill building	Skills-based teaching prioritized over behavior reduction

on parent-collected data, Gethin made good improvements in those skills at home, which was also reflected in his parents' responses to the questionnaire. Despite these improvements, Gethin's parents rated the outcomes of the program less favorably on the social validity assessment, noting concerns with Gethin generalizing the skills outside of therapeutic sessions. It is possible that the improvements they observed at home were not immediately noticeable in their everyday interactions or that they expected larger effects on behavior. It might also be important to acknowledge the range of stressors facing their family and that a variety of factors might have weighed on their responses to the social validity questionnaire. Sharing graphs of parent-collected data and discussing the outcomes of their direct observation and questionnaire outcomes might have facilitated greater acknowledgement of Gethin's progress at home, but it is also possible that his parents' concerns accurately reflected the variability of Gethin's engagement with skills. It might be particularly important to note that for the skill of instruction following, some evocative situations might have required Gethin to stop a preferred activity to follow the instruction, which could have affected errors with those skills. Assessing instruction following under conditions in which stopping or pausing a preferred activity was not required might have yielded different outcomes.

Hari's foster parents also reported improvement in skills from baseline to posttreatment on their questionnaire, despite not participating in teaching the skills at home or collecting skill-specific data. They also responded more favorably regarding the outcomes of the program on the social validity questionnaire, reporting anecdotally that they noticed improvements in Hari's appropriately recruiting attention at home and calling them by their names. Across the weeks of engaging with the program, his foster parents also reported greater stability in his placement, and that learning the skills in the PLS program had allowed him to access additional services that were previously unavailable to him due to his skill deficits and problem behaviors.

As this study was the first to apply PLS procedures to school-age, typically developing children with significant trauma histories, an important goal was to determine whether procedural adaptations were necessary for these participants. Prior studies have generally taught skills in large groups (i.e., class-wide teaching; e.g., Hanley et al., 2007, 2014) or small groups (e.g., Luczynski & Hanley, 2013), with one-to-one teaching reserved for those children who failed to master skills in group contexts (e.g., Falligant & Pence, 2017). In the current study, children experienced one-to-one teaching from the outset. Although we contemplated small group teaching across children with comparable histories and similar skill deficits, ultimately the clinical team and social workers involved with the children opted for individualized teaching programs. Given the instability in the children's social relationships (including Hari's recent foster care placement breakdown), the team felt strongly that one-to-one sessions with a known therapist would more effectively facilitate emotional safety (see Rajaraman et al., 2022) than placing the children in groups with other children who were unknown to them. Further, this approach allowed us to individualize the teaching curricula to exclude skills the children had already mastered, thereby improving the efficiency of the program. Given that social services may only fund a limited number of therapeutic sessions, making the most efficient use of time is critical.

Despite our choice to conduct teaching in a one-to-one teaching arrangement, it is possible that some children might prefer group teaching. Future researchers (or therapists) might further facilitate choice and shared governance by giving children the option to participate in group or individual sessions. It also might be possible that starting with one-to-one sessions and working up to group sessions could be beneficial. We approximated this approach with Gethin, whose brother attended sessions later in the teaching program. Gethin's errors of commission (i.e., inappropriate behaviors) increased during these sessions, which likely mimicked longstanding patterns of behavior with his sibling (e.g., competing for adult attention, arguing). The degree to which these errors would have been observed with a peer is unknown, but given that Gethin and his brother lived together, working on skills with his sibling seemed to be the most socially valid option. However, the increase in commission errors during these sessions suggests that additional supports might be necessary to better support children in small groups. Gradually introducing peers (i.e., moving from one-to-one teaching to small groups), allowing children to set ground rules for group sessions, and reinforcing adherence to those rules might be useful options.

Although this study provides promising preliminary data for the applicability of the PLS program for children with trauma histories, it was not without limitations. Only Gethin experienced training on friendship skills, which might arguably be one of the most important skills for children with trauma histories to learn (Criss et al., 2002). Future studies should seek to validate this part of the curriculum with additional children. The finding that performance of both participants in postteaching probes was somewhat variable points to additional limitations; in particular, the mastery criterion may not have been sufficiently stringent to establish robust and durable acquisition of skills and it would have been helpful to initiate additional teaching for skills that were not consistently maintained postteaching.

Gethin's continued engagement in errors of commission, although sporadic, suggests that additional procedures might have been needed to target those behaviors more directly. As the PLS is typically employed as a Tier 1 or 2 intervention (Simonsen & Sugai, 2019), this finding is not particularly

surprising. We also acknowledge that our decision to not treat correct responses and errors of commission as mutually exclusive is a significant departure from prior PLS studies and that simultaneous engagement with skills and problem behavior would not be a long-term goal. One aim of the current study, however, was to determine the degree to which skills-based teaching would address challenging behaviors for this population. Therefore, we felt scoring skills and errors of commission as independent responses helped us capture this. Future studies might employ procedures in which the criterion for correct responding is gradually changed across the teaching program, such that problem behavior becomes incompatible with obtaining reinforcement for correct responding.

Despite our efforts to involve caregivers in the teaching procedures, uptake of those opportunities was limited. Although at least one of Gethin's parents attended each session, only 50% of sessions were attended by both parents. The degree to which parents implemented procedures at home with integrity is unknown, despite the family reporting some improvements in behavior at home. Gunning et al. (2020) used much more intensive training protocols (e.g., in-vivo teaching, mastery criteria) for the parents in their study and involved parents in directly teaching skills. Although this might have improved outcomes in the current study, we were sensitive to the range of issues facing participating families and made decisions aimed at decreasing the effort for participation. Even so, Gethin's parents reported that the procedures were not necessarily easy to implement at home, and Hari's foster parents chose not to participate at all, potentially pointing to the need to further involve parents in the initial development of training protocols that have better contextual fit with the family's circumstances.

Taken together, the results of this study provide a useful jumping off point for additional research on evaluating PLS procedures for children who have experienced trauma and their biological or foster families. The study also contributes to the growing literature that shows the applicability of the PLS curriculum in cultures outside the United States, and demonstrates the goals of the program were deemed important and relevant by both the children and their caregivers. Future researchers may wish to explore children's preferences for individual or group learning contexts, as well as how families might be more seamlessly integrated into PLS teaching programs. It might also be useful to identify additional skills that should be integrated into the curriculum for these types of children (e.g., emotional understanding; Pollak et al., 2000) and how to teach those skills most effectively. Although supporting children with persistent ACEs requires a multidisciplinary approach that addresses a range of behavioral deficits and excesses, the current study provides promising results that the PLS could be an important part of that process.

Data Availability All data generated or analyzed during this study are included in this published article.

Declarations

Competing Interests The authors have no competing interests to declare that are relevant to the content of this article.

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