PRESCHOOL LIFE SKILLS: RECENT ADVANCEMENTS AND FUTURE DIRECTIONS

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Over the past decade, researchers have replicated and extended research on the preschool life skills (PLS) program developed by Hanley, Heal, Tiger, and Ingvarsson (2007). This review summarizes recent research with respect to maximizing skill acquisition, improving generality, evaluating feasibility and acceptability, and testing predictions of the initial PLS study. For each area, we suggest directions for future research.

Key words:　kindergarten readiness, preschool life skills, prevention, problem behavior, prosocial skills, response to intervention

Hanley, Heal, Tiger, and Ingvarsson (2007) developed a problem behavior prevention program in response to data suggesting that nonfamilial center-based childcare in the first 4.5 years of life was a risk factor for developing problem behavior (National Institute of Child Health and Human Development, Early Child Care Research Network, 2003). Named the preschool life skills (PLS) program, it consisted of classwide teaching of 13 skills across four units that were either functionally related to problem behavior or reported by kindergarten teachers to be important to school readiness (see Table 1). Participants were children in an inclusive, university-based preschool. PLS was implemented by preservice teachers using behavioral skills training (Miltenberger, 2012). This active teaching approach involved providing a rationale and description of the skills, modeling correct skills, rehearsing, arranging authentic learning opportunities (i.e., evocative situations) throughout the day, and delivering differential consequences (praise or a corrective prompt and another chance to practice the skill). A multiple-probe design across units showed acquisition of the skills and reduction of problem behavior for most children. The purpose of this brief review is to summarize recent research on PLS and discuss directions for future research.

MAXIMIZING ACQUISITION

In the initial PLS study, Hanley et al. (2007) implemented behavioral skills training for each skill over a 2-day period. Descriptive data showed that each child experienced a minimum of 10 and a mean of 13 opportunities to practice each skill before moving to the next skill. These opportunities were embedded into classroom activities (e.g., lunch, outdoor play) and varied unsystematically across children. For example, during the teaching of skill 1 (responding appropriately to name), a teacher would call a child's name, wait 2 s for the child's response, and provide descriptive praise following the skill or reset the opportunity to practice following an error (see Appendix of Hanley et al.,

Table 1
Preschool Life Skills

Skill #	Skill Description	Skill #	Skill Description
Unit 1: Instruction Following		Unit 3: Tolerance for Delay	
1	Responding appropriately to name	8	Tolerating delays imposed by adults
2	Complying with simple instructions	9	Tolerating delays imposed by peers
3	Complying with multi-step instructions		
Unit 2: Functional Communication		Unit 4: Friendship Skills	
4	Requesting assistance	10	Saying "thank you"
5	Requesting attention	11	Acknowledging or complimenting others
6	Framed requesting to adults	12	Offering or sharing
7	Framed requesting to peers	13	Comforting others in distress

2007 for additional details on the teaching procedures).

PLS was initially evaluated as a classwide program and characterized in Hanley et al. (2007) as a Tier 1 application in a response-to-intervention (RTI) framework (National Center on Response to Intervention, 2010). Subsequent studies evaluated PLS in a small-group (Tier 2 application; Beaulieu, Hanley, & Roberson, 2012, 2013; Luczynski & Hanley, 2013; Luczynski, Hanley, & Rodriguez, 2014) or one-to-one (Tier 3 application; Francisco & Hanley, 2012; Kraus, Hanley, Cesana, Eisenberg, & Jarvie, 2012) format. Children in these studies were those for whom teachers expressed concern or who were not responding to classwide PLS. Implementing PLS on a smaller scale permitted increased teaching opportunities and the use of performance-based criteria to advance to the next skill. Performance-based criteria were more stringent than the time-based criterion used in the initial study. For example, Luczynski and Hanley (2013) required a skill occurrence on 85% of opportunities across multiple nonconsecutive sessions.

Toward the same end, several studies refined aspects of teaching PLS. Francisco and Hanley (2012) demonstrated the superiority of scheduling a progressively increasing intertrial interval between teaching opportunities (i.e., a gradual increase in time between trials each day) for children who failed to acquire skills in the typical classwide format that relied on distributed intertrial intervals (i.e., a trial about every 30 min). These authors conceptualized that short intertrial intervals improved acquisition, whereas longer intervals promoted maintenance and generalization. Their data showed that skill acquisition and generalization were ensured by combining both interval types during teaching.

Other studies modified consequences for errors or skills. In the initial PLS study, teacher attention eventually followed an error on opportunities to request adult attention (skill 5), which may have resulted in prompt dependence with some children. Luczynski and Hanley (2013) used extinction (withholding attention) following errors in requesting adult attention to address this potential limitation. Other researchers used tokens, stickers, and access to preferred activities to supplement praise for skill occurrences (Beaulieu et al., 2012, 2013; Beaulieu & Hanley, 2014; Hanley, Fahmie, & Heal, 2014; Kraus et al., 2012). For example, Beaulieu and Hanley (2014) combined a token economy with a classwide lottery-reward system to deliver intermittent activity- and privilege-based rewards for children who effectively responded to their name (skill 1).

Future Directions

Over 70 children between 3.2 and 5.4 years of age have participated in PLS research, and

nearly all children showed an increase in skills and a decrease in problem behavior following teaching. These performance measures have been collected during programmed opportunities. One way to obtain more comprehensive measures of performance is to collect whole-day samples outside of programmed opportunities.

In some studies, supplemental rewards (e.g., tokens) were used at the onset of teaching or during remedial teaching. Researchers should delineate the conditions in which supplemental rewards should be used to enhance acquisition. For instance, the friendship skills in unit 4 are considered foundational to prosocial development, but they were acquired least successfully in Hanley et al. (2007, 2014). Therefore, supplemental rewards as implemented by Beaulieu et al. (2012) and Beaulieu and Hanley (2014) should be evaluated to improve the acquisition of friendship skills. Researchers have taught PLS skills in either a classwide, small-group, or one-to-one format. However, future research is needed on a delivery model that involves a combination of all three formats, with ongoing evaluation of children's progress in an RTI approach. Researchers also should evaluate the efficacy of PLS as applied by Hanley et al. (2007) with individuals with intellectual or developmental disabilities.

EVALUATING AND IMPROVING GENERALITY

Hanley et al. (2007) embedded teaching across a variety of activities, teachers, and peers, and teaching occurred throughout the school day, which capitalized on the technique Stokes and Baer (1977) referred to as "training loosely." Also, Hanley et al. (2007) taught functional communication responses thought to recruit reinforcing consequences from novel adults and peers. However, the researchers also used discriminable contingencies such as continuous reinforcement (e.g., attention for every instance of "excuse me") and signaled delays

(e.g., "wait, please" following a request) that may inhibit generality.

Luczynski et al. (2014) assessed the generality of functional communication (requesting assistance, skill 5; requesting attention, skill 6; requesting items, skill 7) and delay tolerance with adults (skill 8) to unfamiliar classrooms with teachers unfamiliar with the children's experience with PLS. All children exhibited moderate to high levels of the skills in these generalization tests, which demonstrated the transfer of skills to other classrooms not associated with teaching. However, children showed gradual decreases in the skills with corresponding increases in problem behavior after several generalization tests. In response, Luczynski et al. made modifications toward training even more "loosely," which included programming unsignaled delays and denials with vague cues and a wider range of latencies to reinforcers. These enhancements only slightly improved the persistence of skills during generality tests; the small effects were most likely due to the unfamiliar teachers not delivering sufficient reinforcement for the skills. Therefore, Luczynski et al. briefly described the skills and role-played the teaching procedures with the unfamiliar teachers. This brief teacher training produced a satisfactory level of persistence of the skills.

Beaulieu and colleagues evaluated additional strategies to improve the generality of unit 1 outcomes. First, the researchers taught children to respond to group calls (e.g., "everyone") and group instructions (e.g., "get your pencils"), which extended teaching to the instructional types that children experience in preschool classrooms (Beaulieu et al., 2012, 2013; Beaulieu & Hanley, 2014). Second, Beaulieu et al. (2013) evaluated the effects of peer-mediation to improve maintenance of the skills. As mediators, peers delivered praise or positive hand gestures (fist pump, high-five, or thumbs up) following the skill and reminders of the skill following errors. Peer mediation produced

further improvements in the short-term maintenance (2 to 4 weeks) of responding to one's name and compliance, which was likely a function of peers providing consequences to children when teachers were not present.

Future Directions

Of the studies that attempted to enhance the generality of PLS, only one (Luczynski et al., 2014) has assessed long-term maintenance of skills to unfamiliar classrooms. Peer mediation might support long-term maintenance but this would require that the same group of peers is present in the new classroom. Perhaps the key to achieving satisfactory maintenance and generalization is to teach peers and teachers in the new classroom to recognize and reinforce the skills taught previously (Luczynski et al., 2014). Some skills may require further refinement to make reinforcement more likely. For example, teachers may be more likely to reinforce the skill of requesting help when a task is too difficult if this skill follows a brief period of child persistence at the task (akin to the skill taught by Rodriguez, Levesque, Cohrs, & Niemeier, 2017).

EVALUATING FEASIBILITY AND ACCEPTABILITY

Hanley et al. (2007) took place in a university-based preschool with a relatively dense teacher-student ratio and continuous on-site supervision from masters-level behavior analysts. The preservice student teachers reported high social acceptability after implementing PLS. Hanley et al. (2014) established the feasibility of PLS under more typical conditions (e.g., leaner teacher–student ratios, varied teacher training histories) through a systematic replication in two Head Start preschool classrooms. In this study, teachers received daily support by masters-level behavior analysts.

Three studies further evaluated social acceptability of PLS and its outcomes by assessing the opinions of stakeholders such as administrators (Beaulieu et al., 2012; Luczynski & Hanley, 2013), nonimplementing teachers (Beaulieu et al., 2012, 2013; Luczynski & Hanley, 2013), and parents (Luczynski & Hanley, 2013). These studies used videos of child performance during preteaching and postteaching to improve the validity of raters' feedback.

Future Directions

PLS research has been implemented by over 30 teachers in 12 classrooms, and stakeholders have reported high satisfaction. However, no research has shown the feasibility of PLS in the absence of ongoing consultative support. Also, research is needed on an optimal consultation model that considers cost, efficiency, and durability of teacher training outcomes; measures of procedural fidelity also should accompany such research. Successful models of adoption such as that of school-wide Positive Behavior Interventions and Supports (Sugai & Horner, 2006) and the Good Behavior Game (Kellam et al., 2014) should be considered.

TESTING PREDICTIONS WITH RANDOMIZED CONTROLLED TRIALS

Two studies used randomized controlled trial (RCT) methods to test predictions relevant to PLS: (a) that teaching children to respond to their name increases compliance (Beaulieu et al., 2012), and (b) that PLS prevents the development of problem behavior (Luczynski & Hanley, 2013). Beaulieu et al. (2012) assigned six children to a test group in which they were taught how to respond to their name (skill 1) and five children to a control group in which they were not taught this skill. Random assignment of children to groups controlled for threats like selection bias, maturation, and classroom history. Five of six children in the test group showed improvements in compliance with

single-step instructions (skill 2) after they were taught to respond effectively to their name; by contrast, the children in the control group showed no improvement in compliance. This study provided evidence that mastering skill 1 increased skill 2 without direct teaching of skill 2.

Luczynski and Hanley (2013) tested the preventive effects of teaching functional communication and delay tolerance in an RCT, with 12 children randomly assigned to test and control groups. Children in the test group experienced units 2 and 3 of PLS. Children in the control group experienced the same number of sessions and materials, but instead of the PLS program, relevant evocative situations were avoided by providing noncontingent access to typical classroom reinforcers. All children in the test group exhibited high levels of the skills and no problem behavior following teaching. All children in the control group exhibited significantly more problem behavior in the same period of time. That is, programming evocative (challenging) situations and teaching skills in and for those situations prevented the development of problem behavior. These results support arranging evocative situations and repeatedly teaching functionally relevant skills to prevent problem behavior in lieu of antecedent (proactive) strategies geared toward avoiding situations that are inevitable in classrooms.

Future Directions

Two studies have tested the effects of PLS in RCTs with select skill units and in small-group formats. Additional RCTs should evaluate PLS across all units in a classwide format, and should be conducted by other research groups. Ultimately, longitudinal data like those obtained on the effects of center-based care experienced during early childhood and the level of problem behavior in later years (Belsky et al., 2007; Vandell, Belsky, Burchinal, Steinberg, & Vandergrift, 2010) should be collected to identify the long-term impact of PLS on child success.

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