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Effects of the First Step to Success Intervention on Preschoolers with Disruptive Behavior and Comorbid Anxiety Problems

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Abstract

Preschoolers with elevated anxiety symptoms are at high risk not only for developing more severe mental health disorders in later life but are also apt to respond more poorly to intervention if they present with comorbid disruptive behavior. Because early signs of anxiety disorders may not be recognized as such in preschool settings, many children selected for Tier 2 interventions that target externalizing problem behaviors may also have co-occurring anxiety symptoms and disorders. The First Step to Success intervention has recently been adapted for preschoolers with externalizing behaviors and was found to be efficacious in a randomized controlled trial. The current report examines effects of the First Step intervention on a subsample of 38 preschoolers with comorbid anxiety symptoms. Compared to usual-care controls, preschoolers who were assigned to the First Step intervention demonstrated medium to large effects in reducing externalizing behavior and improving social functioning outcomes, but had small effects for reductions in internalizing behaviors. Implications for intervening with preschoolers at risk for comorbid disruptive and anxiety behaviors are discussed.

Keywords

anxiety; internalizing behavior; externalizing behavior; school-based; behavioral intervention

Anxiety disorders are among the top five health burdens in terms of their disabling impact within U.S. populations (U.S. Burden of Disease Collaborators, 2013). Unfortunately, anxiety disorders are also the least likely of the major pediatric mental health disorders to be treated across the main mental health service delivery systems including mental health,

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Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Conflict of Interest: Drs. Feil, Walker, and Golly are three of the authors of the Preschool First Step to Success intervention.

general medicine, social services, juvenile justice, and school settings (Merikangas et al., 2011). The most efficacious evidence-based interventions for anxiety disorders for children and adolescents are generally considered to include a combination of pharmacotherapy and cognitive–behavioral treatments (Franklin et al., 2011; Piacentini et al., 2014). However, there is limited efficacy research on early interventions targeting anxiety disorders among children. The dearth of trained therapists and reluctance of families to medicate their young children are formidable barriers to accessing evidence-based practices (Ryan, 2014). As Luby (2013) notes, “early interventions during a time of greater developmental change holds promise to be an area where larger and more enduring treatment effects are possible” (p. 355).

Preschoolers with disruptive behavior, who do not readily respond to universal classroom management strategies in Head Start or other early childhood classrooms, may often be selected for more intensive second-tier interventions. Although this disruptive behavior may seem obvious to teachers and even parents, accompanying comorbid anxiety disorders may go unrecognized and may not be specifically targeted by these broad-based, generic interventions. Such interventions primarily involve behavioral approaches that target a wide range of disruptive behavior disorders (Forness, 2011). The differential impact, however, of such behavioral intervention approaches on preschoolers who are also at risk for heterotypic comorbid psychiatric disorders such as disruptive behavior and anxiety disorders has not been well established (Luby, 2013). This is an important issue given that anxiety disorders not only have high comorbidity with disruptive behavior disorders (Franz et al., 2013), but such comorbidity also portends poorer treatment outcomes (Garcia et al., 2010; Hudson et al., 2015; Rapee et al., 2013). Furthermore, even after accounting for comorbid disorders, parents of children with anxiety disorders are 3.5 times more likely to report a negative impact on family functioning relative to parents of children without anxiety disorders (Towe-Goodman, Franz, Copeland, Angold, & Egger, 2014).

First Step to Success is a broad-band, Tier 2 early intervention originally targeted to K–3rd grade students with externalizing behavior problems involving disruption, aggression, and oppositional–defiant forms of behavior (Walker et al., 1998). Based upon a Social Learning theoretical framework, First Step is an early intervention that consists of three modular components: (a) universal screening to identify qualified candidates for the program; (b) a school intervention component focused on improving teacher and peer-related adjustment along with overall school success; and (c) a parent-training component, called *homeBase*, in which parents are taught to teach their child school success skills at home which are then noted, prompted, and reinforced by the child’s teacher(s). The First Step program is designed to assist students with externalizing behavior problems in getting off to a good school start and has been the subject of a continuous series of studies since it was developed (see Walker et al., 2014, for a review and update of the evidence base on First Step). Recently adapted for use with preschoolers, First Step was found to be efficacious in a large randomized controlled trial (Feil et al., 2014) that forms the basis for the current study.

First Step has thus focused primarily on, and has been quite effective with, disruptive behavior. However, it is not clear to what extent its effectiveness might be impacted by the presence of comorbid anxiety disorders as noted above. In a recent comprehensive review on

treatment of preschoolers with anxiety disorders, Luby (2013) notes only five relatively small studies had been conducted that targeted anxiety problems at the time of the review. The anxiety treatments were primarily developmental adaptations of cognitive-behavioral interventions and tend to emphasize parent psychoeducation and active teaching and coaching during parent-child interactions. There is reason to think, however, that there are certain aspects of First Step that might at least indirectly address anxiety problems. First Step, for example, includes intervention components that have been shown to ameliorate anxiety symptoms such as extensive social skills training (Rapee et al., 2013; Spence, 2003) and parent coaching and training (Berstein, Bernat, Victor, & Layne, 2008; Rapee, Kennedy, Ingram, Edwards, & Sweeney, 2005; Wood et al. 2006). As such, we hypothesized that clinically meaningful intervention effects might be achieved for internalizing symptoms because social isolation (Mathews et al., 2015) and behavioral inhibition (Rapee et al., 2010) are considered critical aspects of anxiety disorders and their treatment. Students with severely disruptive or aggressive behavior problems can often be isolated due to the aversive nature of their behavioral characteristics (Walker & Gresham, 2014). A unique feature of First Step involves use of a combined individualized and group dependent contingency wherein the classroom focus is on providing not only a system of reinforcement for the target child but also an opportunity for the target child to earn a brief rewarding activity for classmates if he or she meets a daily performance criterion, thereby increasing social acceptance and decreasing behavioral isolation by peers. Thus, although First Step does focus substantially on disruptive behavior, it includes elements that might nonetheless prove helpful for young children with comorbid anxiety disorders. Although these First Step components do not necessarily focus on anxiety symptoms per se, they are meant to increase general social and adaptive skills that could help to ameliorate forms of anxiety-driven behavior.

The purpose of the current study, therefore, was to extend the efficacy trial findings from Feil and colleagues (2014) by conducting secondary analyses, using a subsample of participants to determine the effects of the First Step intervention among preschoolers with comorbid disruptive behavior and anxiety problems. Our research questions involved whether a subsample of preschoolers with co-occurring disruptive behavior problems and anxiety symptoms who received the First Step intervention demonstrated significantly greater gains compared to control participants with respect to (a) externalizing behavior, (b) social functioning, and (c) internalizing behaviors. As noted previously, most Tier 2 interventions do not address such heterotypic comorbidity but nonetheless will inevitably include children at risk for unrecognized comorbid psychiatric disorders that may negatively impact outcomes of generic behavioral approaches. Because such comorbidity portends poorer treatment outcomes, we wanted to examine whether effect sizes on externalizing behavior and social functioning in the comorbid subsample would be comparable to the medium-to-large effects found in our original trial. Furthermore, we wanted to examine to what extent, if any, internalizing symptoms would be improved as well.

Method

Participants

Participants for this study included 38 of 126 student, parent, and teacher triads recruited across three cohorts between 2009 and 2012 for participation in a randomized controlled efficacy trial of the preschool adaptation of First Step to Success (Feil et al., 2014). Project staff recruited participants from Head Start and preschool programs in Oregon, Kentucky, and Indiana. Randomization occurred at the classroom level; however, only one student per classroom participated in the study. Specifically, the student in each classroom who exhibited the most severe externalizing behavior based on teacher report was randomized either to the First Step intervention condition or usual care-control.

Procedures

Project staff obtained IRB approval for the study prior to recruiting and consenting participating teachers. Consented teachers identified children in their classroom who exhibited elevated externalizing behavior using an adapted version of the *Early Screening Project* (ESP; Feil, Walker, & Severson, 1995). The ESP is a multiple-gated screening procedure. Teachers, at screening stage 1, identified and rank-ordered five children in their classroom who most closely matched a description of externalizing behavior. Teachers then completed three stage-2 rating scales from the ESP for each child: the Adaptive Behavior Index (ABI), Maladaptive Behavior Index (MBI), and Aggressive Behavior Scale (ABS). Project staff rank-ordered the five students within each classroom based on stage-2 rating scale scores to identify the highest-ranked child. When unable to recruit the highest-ranked child, project staff recruited the next highest ranked child in the classroom until they obtained parent consent for one child in each classroom or the parents of all eligible children in a classroom declined participation.

For the efficacy trial, 61 child–parent–teacher triads were randomized to the usual-care control condition and 65 triads were randomized to the intervention condition. Children participating in the efficacy trial were primarily male (65%), African American (31%), or Caucasian (44%), and had a mean age of four years ($SD = 0.4$). Participating teachers were African American (18%) or Caucasian (72%) and nearly all were female (99%). Teacher education levels varied with 22% reported holding a high school diploma, 33% an associate degree, 23% a bachelor's degree, and 22% a master's degree or higher. Teachers reported teaching on average for 14 years ($SD = 9.2$).

Parents and teachers in triads randomized to the intervention condition received ongoing, one-on-one consultation with a behavioral coach. Teachers received support implementing the program and parents met weekly with the coach for six to eight weeks with sessions focusing primarily on the promotion of school success skills. Intervention teachers also received training in the preschool version of First Step (described below) as well as in classroom management and positive behavior support techniques (Golly, 2006; Sprague & Golly, 2013). Teachers in triads who were randomized to the usual-care control condition received only a brief training session in classroom management strategies and positive

behavior strategies, whereas parents in usual-care triads did not receive any support or training from project staff.

Behavioral coaches held a bachelor's degree or higher and completed a two-day training session during which they received intensive training on First Step implementation. Coaches met weekly in person or via phone with lead implementers to discuss and troubleshoot cases. Frequent fidelity checks were conducted to ensure program adherence and implementation quality.

Project staff collected baseline data prior to randomization and implementation training; approximately four months later upon completion of the intervention, they collected posttest data. Intervention and usual-care conditions did not differ on the mean number of days between baseline and postintervention ($t[122] = 0.87$, $p = .386$). Postintervention packets were collected an average of 128 days ($SD = 28.6$) after baseline for intervention triads; for usual-care triads, packets were collected an average of 133 days ($SD = 28.1$) after baseline. For further details on procedures for the efficacy trial see Feil et al. (2014).

Elevated Anxiety Sample

To identify children at risk for anxiety disorders for the current report, we utilized parent report on the Early Childhood Inventory-4 (ECI-4; Gadow & Sprafkin, 2000). The ECI-4 is a screening tool for childhood behavioral, affective, and cognitive disorders and is based on the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (American Psychological Association, 1994). For anxiety disorders, the ECI-4 includes DSM screening criteria for separation anxiety disorder, generalized anxiety disorder (GAD), social phobia, specific phobia, obsessive–compulsive disorder (OCD), and posttraumatic stress disorder (PTSD). ECI-4 items are scored on a four-point frequency scale (*never, sometimes, often*, and *very often*). To meet categorical symptom criteria, items for each disorder are dichotomized (i.e., *never* and *sometimes* = 0, *often* and *very often* = 1) and scored in accordance with DSM symptom cutoffs. As a screening tool, the ECI-4 assesses symptomatology but does not address onset, duration, functioning, or exclusionary criteria for a disorder. Thus, children who meet criteria for a disorder on the ECI-4 should be considered as being "at risk" rather than meeting criteria for a formal diagnosis. The ECI-4 symptom categories have demonstrated moderate to high internal consistency (Gadow, Sprafkin, & Nolan, 2001; Cronbach $\alpha = .63$ - .95) and moderate to high 3-month temporal stability (Gadow & Sprafkin, 1997; test-retest r = .43 - .77).

Utilizing ECI-4 symptom criteria for separation anxiety disorder, GAD, social phobia, OCD, and PTSD, 38 of 126 children (30%) met criteria for being at risk of developing an anxiety disorder (separation anxiety, n = 7; GAD, n = 6; social phobia, n = 4; OCD, n = 14; with an additional seven children meeting criteria for more than one anxiety disorder simultaneously). Based on ECI-4 criteria for disruptive disorders, six of 38 children in the sample met criteria for ADHD, two met criteria for conduct disorder, another two children met criteria for oppositional defiant disorder, and 18 children met criteria for more than one disruptive disorder. The remaining 10 children did not meet criteria for a disruptive disorder based on parent-reported ECI-4 data. Although we did not necessarily set out to require equal numbers in each condition, the ECI-4 criteria for anxiety disorders nonetheless

resulted in 38 children being evenly divided between intervention and usual-care conditions (i.e., 19 children per condition).

We compared the sample at risk for anxiety disorders identified for this report ($n = 38$) to the remaining children who were not so identified from the sample ($n = 88$) on baseline outcome measures. As reported in Table 1, the identified and non-identified children differed significantly on teacher- and parent-reported internalizing behavior. Children in the sample at risk for anxiety disorders had higher parent-reported externalizing behavior and higher teacher-reported adaptive behavior as compared to the non-identified children from the original sample.

The First Step to Success Intervention for Preschool Settings

The First Step to Success intervention is a manualized intervention for elementary school students (Walker et al., 1998). The program includes a classroom-based component (CLASS) and a home-based component (homeBase). First Step has been recently adapted for preschool or Head Start classroom use and is implemented as part of the teacher's regular classroom routine. The program and its adaptations are described below.

Classroom-based component (CLASS).—The classroom component has three phases completed across 30 program days: (a) coach phase, (b) teacher phase, and (c) maintenance. The classroom component reinforces adaptive behavior patterns intended to enhance school success and improve peer relations. During the coach phase (program days 1–10), the behavioral coach coordinates implementation of the program, working with and coordinating specified roles of the target child, parent(s), teacher(s), and classmates. The coach explains the intervention to each social agent, role plays with the target child, and implements the program for the first ten days. During implementation, the coach provides feedback to the target child using a green and red card to signal appropriate and inappropriate behavior, respectively. The behavioral coach monitors the child's behavior and, at predetermined intervals, awards a point depending on the color of the card. If the child exhibits appropriate behavior (e.g., following classroom rules, cooperating, sharing, sitting quietly and attentively during circle time) when the point award interval occurs, he or she earns a point. If the daily performance criterion of 80% or more available points is met, the target child and his or her classmates receive a brief rewarding activity selected by the child in collaboration with the teacher. Parents also arrange for positive reinforcement in the home setting each day the criterion is met in the classroom by providing an individual activity or reward when the child returns home. If the daily criterion is not met, that program day recycles (i.e., is repeated until the reward criterion is met).

The teacher takes over implementation under close supervision and support from the coach during the teacher phase (program days 10–20) of the program. During this phase, implementation procedures are identical to those described for the coach phase with the duration of the game gradually being extended to the entire day. During the maintenance phase of the program (program days 21–30) the child's dependence on the structured program features is reduced. Praise and expressions of approval from the teacher replace

earned points. Daily feedback is reduced and rewards that are given are contingent upon exemplary performance.

Younger children in preschool settings require additional practice to understand and master the behavioral skills and expectations of the program. In turn, the coach role-plays with the child before each implementation session. In comparison to the elementary version of the program, the coach also provides more supervision and problem-solves more frequently. For example, if the child's behavior is inappropriate and he or she does not respond to feedback, the coach will determine if the child understands the expectations and, if not, will role-play the expected behavior with the child and encourage the child to comply.

Home-based component (homeBase).—During the home component the behavioral coach meets weekly, for a six to eight week period, with the target child's parents or caregivers. Each weekly session focuses on one skill such as communication and sharing, cooperation, limit setting, problem solving, friendship making and self-confidence. The coach provides support to the family, helps troubleshoot problems and issues that arise during and following completion of the program, and facilitates communication between the home and school. To facilitate implementation with younger children, parent meetings are conducted with the parent and child so that, if needed, the coach can model positive interactions with the child during completion of weekly homeBase activities. As well, initiation of the homeBase component begins after day three rather than day ten. For more detailed descriptions of the First Step program and adaptation for preschool settings, see Feil et al. (2014) and Frey et al. (2013).

Outcome Measures

Social Skills Improvement System Rating Scales (SSiS). For this report, we examined the teacher-reported and parent-reported social skills scale, problem behavior scale, and internalizing behavior subscale from the SSiS rating scales (Gresham & Elliott, 2008). Items are reported on a 4-point frequency scale (*Never, Seldom, Often, Almost Always*). The 7-item teacher-reported version of the internalizing subscale ($\alpha = .73$) and the 10-item parent-reported version of the internalizing subscale ($\alpha = .70$) assess internalizing behaviors such as anxiety, loneliness, sadness, and low self-esteem. For SSiS subscales, standard scores are not available; thus, raw scores are reported. Higher raw scores on the internalizing subscale indicate higher levels of symptomatology. The social skills scale assesses behaviors that facilitate positive interactions and minimize negative interactions (Gresham & Elliott, 2008). The teacher-reported ($\alpha = .93$) and parent-reported ($\alpha = .95$) versions of the social skills scale include 46 items pertaining to common social behaviors such as communication, cooperation, assertion, responsibility, empathy, engagement, and self-control. The problem behavior scale assesses behaviors that interfere with prosocial behavior (Gresham & Elliott, 2008). The teacher-reported version includes 30 items ($\alpha = .89$), whereas the parent-reported version has 33 items ($\alpha = .92$). For the social skills and problem behavior scales, standard scores were computed using gender-specific normative data from the SSiS manual.

Process Measures

Project staff collected implementation fidelity data, measures of teacher and coach alliance, estimates of child and parent compliance, measures of parent fidelity and dosage, and satisfaction data for triads randomized to the intervention condition.

Implementation fidelity checklist (IFC).—The IFC assesses adherence to program guidelines and implementation quality for the CLASS component. The IFC was adapted to preschool settings from Walker et al. (2009). Observers conducted three observations for each case: one during the coach phase and two during the teacher phase. For 20% of the IFC observations, we collected interrater reliability data. Interrater reliability was acceptable (ICC[3,1] = .82). The IFC assesses implementation of 16 core PFS program components (α = .89). For each component, adherence ratings are scored dichotomously (i.e., *yes* or *no)* and quality rating are assessed on a 5-point scale (0 = *very poor*, .25 = *poor*, .50 = *okay*, .75 = *good*, 1.0 = *excellent*). Adherence scores represent the proportion of observed components implemented correctly. Quality scores represent the mean item rating across core components. Mean ratings across implementers were calculated to examine overall classroom quality.

Classroom monitoring form (CMF).—The coach and teacher use the CMF daily to log the target child's compliance (Walker et al., 2009). The CMF facilitates tracking of (a) points earned, (b) whether the daily criterion was met, and (c) whether a recycle day was necessary. CLASS dose is the proportion of 30 program days completed. Child compliance is the proportion of program days successfully completed to total program days (Sumi et al., 2012; Walker et al., 2009). Scores for both measures range from 0 to 1. As an example, if a child completes all program days without recycling, he or she would have a compliance score of 1.0 (i.e., 30/30); if a child successfully completes all 30 program days but has nine recycles days, he or she would have a compliance score of .77 (i.e., 30/39).

homeBase monitoring form (HMF).—The coach uses the HMF weekly to log the sessions completed, parent fidelity, and completion of homework assignments (Walker et al., 2009). HMF data are used to compute homeBase dosage, parent fidelity, and parent compliance. We calculated homeBase dosage as the proportion of sessions delivered. Dosage scores range from 0 (i.e., no sessions delivered) to 1 (i.e., all sessions delivered). For each session, the coach rates parent fidelity on a 3-point scale: *high* (1), *medium* (0.5) and *low (0)*. Parents who implement all procedures effectively are rated *high*; parents who exhibit moderate skill and enthusiasm are rated *medium*; and parents demonstrating limited skill, interest, and cooperation are rated *low*. Parent fidelity is the mean fidelity score across sessions. Higher scores (ranging from 0 to 1) indicate higher parent fidelity. Parent compliance is the proportion of homework assignments completed (range: 0 to 1).

Alliance survey.—Program implementers completed a 10-item alliance measure to assess their collaboration of program implementation (Walker et al., 2009). The teacher and coach report on one another's approachability, shared goals, communication skills, willingness to collaborate, and overall effectiveness. Items range from *never* to *always* on a 5-point scale. For each informant we computed the mean rating across the 10 items. Scores range from 0

to 5 and higher scores indicate higher mean alliance ratings. Coefficient alpha was excellent for both the coach version (α = .94) and teacher version (α = .95).

Satisfaction survey.—Teachers and parents completed a satisfaction survey during the postintervention assessment (Sumi et al., 2012; Walker et al., 2009). The 13-item teacher survey (α = .91) and 12-item parent survey (α = .94) are scored on a 5-point scale ranging from *strongly disagree* to *strongly agree*. Teacher-reported items assess training and support received, program usability, and program effectiveness. Parent-reported items assess program usability and effectiveness within the home setting. For each informant we calculated a mean satisfaction rating across all scale items. Higher scores indicate higher levels of satisfaction.

Statistical Analysis

We specified a linear regression model for each outcome using Mplus 7 (Muthén & Muthén, 1998–2012). Regression models included a covariate (i.e., the baseline value of the outcome) and a dichotomous predictor for intervention condition (1 = PFS intervention, 0 = usual-care control). To account for missing data we utilized the full information maximum likelihood estimator that makes use of all available data to calculate unbiased parameter estimates and standard errors (Schafer & Graham, 2002).

As a measure of intervention effect size, we report Hedges' *g*, the difference between the mean of the outcome measure of each group divided by the pooled within-group standard deviation (What Works Clearinghouse, 2011). An effect size of .2 is considered small; effect sizes of .5 and .8 are considered medium and large, respectively.

As a measure of practical significance we also report the *What Works Clearinghouse* improvement index (What Works Clearinghouse, 2011). The improvement index indicates the anticipated change in the percentile rank of an average child from the control condition (i.e., 50th percentile) if the child had been randomized to the intervention condition.

Given the small sample size ($n = 38$), this ancillary study is considered to be underpowered for detecting clinically meaningful effects. For example, for tests of group differences at posttest for continuous measures with a sample size of 38 the power was < .30 to detect $g = .35$ or greater. Thus, effect size estimates were used to evaluate intervention effects with $g > .35$ as the benchmark for assessing clinically meaningful results.

Results

Preliminary Analyses

As reported in Table 2, there were no statistically significant differences between intervention and control conditions on measures of child demographic characteristics and screening measures. We also examined baseline equivalence of outcome measures and parent and teacher demographics for the two conditions. For all nine outcome measures examined in this report, mean baseline scores were equivalent for the two conditions. With respect to parent demographics, the two conditions were equivalent on all measures, including percent biological or adoptive mothers as informants (χ^2 [1, N = 38] = 2.07, *p*

= .150), percent in two-parent households (χ^2 [1, N = 38] = 1.31, p = .252), percent Caucasian (χ^2 [1, N = 38] = 0.11, p = .744), age of participating parent (t[35] = 1.84, p = .074), or the number of children in the household (t[36] = 0.81, p = .421). All intervention and control teachers were female. Most teachers in the intervention and control conditions were either Caucasian (79% vs. 63%; χ^2 [1, N = 38] = 1.15, p = .283) or African American (11% vs. 21%; χ^2 [1, N = 38] = 0.79, p = .374). The percent of teachers who self-reported attaining a bachelor's degree or higher was equivalent across the two conditions (58% for both conditions). Teachers in control classrooms reported teaching for more years (*M[SD]* = 18.6[8.2]) than teachers in intervention classrooms (*M[SD]* = 12.0[8.8]; t[36] = 2.40, p = .022).

Attrition and Missing Data

For the 38 children examined in this report, baseline and posttest questionnaire data were available for 37 of 38 (97%) teachers and 35 of 38 (92%) parents. Posttest data were not available for one teacher and three parents. Although we obtained parent-reported and teacher-reported data at both time points for most informants, missing item-level data precluded scale scoring on occasion. Two additional teachers were missing two of six teacher-reported outcomes and two additional parents were missing one of three parent-reported outcomes due to missing item-level data. We examined the assumption that data were missing completely at random using Little's MCAR test. The test was nonsignificant (χ^2 = 70.58, p = .492) suggesting data were missing completely at random.

Fidelity, Program Compliance, Alliance and Satisfaction

Descriptive statistics for child, parent, and teacher process measures are summarized in Table 3. Coaches and teachers adhered to over 95% of core program components. For coaches, quality of implementation of the CLASS component was excellent (.94; range = .83 to 1.00); whereas, for teachers, it was acceptable (.80; range = .41 to 1.00). Children in the comorbid sample received 93% (range = 50%–100%) of program days and families received 86% (range = 17%–100%) of homeBase sessions. Although child compliance was excellent (.90) with respect to the CLASS component, parent compliance for the homeBase component was low (.56). Coach-reported parent fidelity was also low (.61). Coach-reported and teacher-reported alliance was high based on mean ratings and both informants reported high levels of satisfaction with the program.

Posttest Differences on Outcome Measures

Table 4 summarizes results from covariate-adjusted regression models. Children randomized to the First Step intervention exhibited significant reductions in externalizing behavior based on teacher and parent report on all four outcome measures and statistically significant improvement in social functioning on the three teacher and parent-reported outcome measures. For reductions in externalizing behavior, Hedges' g effect sizes for teacher-reported measures ranged from 0.59 to 0.79. For improvements in functioning, effect sizes for teacher-reported measures ranged from 0.60 to 0.85. For parent-reported outcomes, Hedges' g effect sizes ranged from 0.66 for reduction in externalizing behavior to 0.61 for improvements in social functioning. Reductions in internalizing behavior were not statistically significant for the two conditions with effect sizes in the small range for parent-

reported (0.23) and small-to-medium range for teacher-reported (0.42) internalizing behavior.

Practical Significance of Intervention Effects

For externalizing behavior, mean improvement across the four outcomes was +26 percentile points (SSiS-EXT-T = +22; SSiS-EXT-P = +25; ESP-MBI-T = +26; ESP-ABS-T = +29). For social functioning, mean improvement across the three outcomes was +25 percentile points (SSiS-SS-T = +23; SSiS-SS-p = +23; ESP-ABI-T = +30). For internalizing behavior, the improvement index ranged from +9 percentile point improvement based on parent report to +16 percentile point improvement based on teacher report.

Discussion

This report advances the literature regarding the differential impact of the First Step intervention on preschoolers at risk for heterotypic comorbid psychiatric disorders such as disruptive behavior and anxiety disorders. Such findings are important given not only that anxiety disorders have an estimated prevalence rate as high as 9 percent among preschool children (Bufferd et al., 2012), but also given that the high comorbidity of anxiety disorders with disruptive behavior disorders (Franz et al., 2013) portends poorer treatment outcomes for children who present with multiple symptoms of both disorders (Garcia et al., 2010; Hudson et al., 2015; Rapee et al., 2013). In this subsample analysis, baseline equivalence between the First Step and control conditions was established, and the implementation measures for the intervention such as fidelity and satisfaction were comparable to those obtained in the original trial involving the total sample (Feil et al., 2014).

The magnitude of the intervention effects on externalizing behavior and social functioning measures were somewhat comparable to those obtained for the original trial of preschoolers with effect sizes ranging from medium to large. For example, on the four teacher-reported behavioral and social outcome measures (i.e., the three ESP measures and the SSiS social skills measures) that were the same as those used in the original trial (Feil et al., 2014), the average effect size for the current study was .74 (range = .60 – .85) compared to.77 (range = .70 – .88) in the original trial. Hence, there appears to be only a slight decrease in the efficacy of First Step on disruptive behavior and social skills due to the presence of comorbid anxiety in this subsample of preschoolers contrary to the previous research on the generally negative impact of this comorbidity on treatment outcomes cited in the introduction.

With respect to the impact of First Step on the internalizing behavior measures on the other hand, the effects were more equivocal with small-to-medium effects obtained for parent report (.23) and teacher report (.42). Hence, although the First Step intervention appears to have a relatively commensurate impact on externalizing behavior problems and social skills for preschoolers with comorbid anxiety symptoms, the broad-band behavioral intervention had a positive but nonetheless limited impact on internalizing behaviors. This is somewhat surprising given that some components of the First Step program might have been expected to produce clinically meaningful improvement in children’s internalizing symptoms. Such components may have contributed to gains on disruptive behavior in the comorbid anxiety

subsample but did not appear sufficient to meaningfully impact their internalizing symptoms. There is evidence that cognitive-behavioral treatment of anxiety disorders per se reduces comorbid disruptive behaviors by as much as a third (Rapee et al., 2013), but whether the reverse is true (i.e., treatment of disruptive behavior can significantly reduce anxiety disorders) is not borne out by the secondary analyses conducted for this report.

The tentative implications of this ancillary study seem relatively straightforward. On the one hand, the presence of comorbid anxiety symptoms do not appear to substantively impact the behavioral or social functioning outcomes of a generic behavioral intervention such as First Step, although it remains important to replicate these findings with larger samples. On the other hand, the First Step intervention had a limited impact on internalizing behaviors, particularly as reported by parents. This latter finding is not surprising given that these preschoolers were originally selected by teachers for their externalizing problem behaviors and the First Step program was primarily designed to reduce disruptive and aggressive behavior. It is worth noting that early signs of internalizing behavior seem notoriously difficult for teachers to recognize let alone address (Briesch et al., 2013; Burke et al., 2012; Gilliam, Maupin, & Reyes, 2016). This is in spite of the fact that there is increasing evidence that anxiety disorders can adversely impact academic performance (Killu & Crundwell, 2016; Shoenfeld & Janney, 2008).

Although this subsample analysis has some considerable strengths given the carefully controlled efficacy trial from which it was drawn, there are several limitations that should be noted. The subsample of preschoolers was small, which limits the statistical power for the study. Given the small sample, we could only examine an overall at-risk anxiety disorder group rather than differentiating between the various types of anxiety disorders such as fear-based disorders (e.g., separation anxiety, phobias, OCD) and distress-based disorders (e.g., GAD, PTSD). In addition, parent symptom checklists were used to identify preschoolers at risk for comorbid anxiety disorders rather than using the gold standard of a child diagnostic interview schedule. Given these limitations, this subsample analysis serves primarily as a hypothesis-generating approach and the practice-based implications must await further confirmation.

With the widespread adoption of multitiered systems, based on the public health model of universal, selected, and indicated prevention within school settings, early evidence-based approaches such as the First Step program hold great promise for reducing the incidence of behavioral disorders and the associated negative sequelae such as poor social and academic functioning (Walker, et al., 1996) Though the evidence base for the effectiveness of generic broad-band behavioral interventions with multiple tiers for addressing externalizing behavior problems is mounting (Walker & Gresham, 2014), more limited evidence exists to date for the early prevention of internalizing disorders (Fisak, Richard, & Mann, 2011). Furthermore, although the design of similar broad-band behavioral or transdiagnostic intervention approaches to address comorbid conditions are in a nascent stage at this time, such approaches seem to compare relatively well in effectiveness to disorder-specific interventions (McEvoy, Nathan, & Norton, 2009; McHugh, Murrary, & Barlow, 2009; Wersing et al., 2017). In this regard, we should note similar subsample analyses from our original randomized controlled trial: one on preschoolers at risk for ADHD (Feil et al, 2016)

and the other on preschoolers at risk for autism spectrum disorder (Frey et al., 2015). Both not only produced large positive effects on disruptive behavior and social functioning but, in contrast to our current findings, also produced medium-to-large effects on comorbid ADHD and autism symptoms, respectively. Should these effects, along with the current findings, be replicated in larger a priori studies rather than post hoc subsample analyses, it would suggest a clear need to coordinate both early identification and intervention efforts to more effectively monitor the specific mental health needs of children at risk for comorbid psychopathology.

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Table 1

Baseline Means and Standard Deviations for Outcome Measures by Comorbid and Externalizing-Only Samples

	Comorbid Sample (*n* = 38)	Externalizing-only Sample (*n* = 88)	Test Statistic	
	M (SD)	*M (SD)*	*t*	*p-value*
Internalizing behavior				
SSiS-INT-T	5.9 (3.6)	4.6 (2.9)	−2.16	.033
SSiS-INT-P	8.9 (4.7)	5.7 (3.3)	−3.80	< .001
Externalizing behavior				
SSiS-EXT-T	18.2 (6.1)	18.0 (5.9)	−0.20	.841
SSiS-EXT-P	20.1 (7.1)	15.0 (6.4)	−3.97	< .001
ESP-MBI-T	28.6 (6.8)	29.6 (6.6)	0.79	.431
ESP-ABS-T	20.1 (6.8)	20.3 (6.2)	0.23	.820
Social functioning				
ESP-ABI-T	24.1 (4.3)	22.1 (4.9)	−2.11	.037
SSiS-SS-T	77.4 (10.4)	76.8 (11.7)	−0.28	.779
SSiS-SS-P	89.9 (11.1)	93.5 (14.4)	1.33	.186

Table 2

Student Baseline Demographic Characteristics and Screening Measures by Study Condition

	Total (*n* = 38)	Control (*n* = 19)	Intervention (*n* = 19)	Test statistic	*p*-value
Demographic characteristic					
Age *M(SD)*	4.1 (0.2)	4.1 (0.2)	4.1 (0.2)	0.00	1.00
Percent Female	10 (26.3)	5 (26.3)	5 (26.3)	0.00	1.00
Percent African American	11 (28.9)	3 (15.8)	8 (42.1)	3.20	.074
Percent Caucasian	19 (50.0)	11 (57.9)	8 (42.1)	0.95	.330
Percent on IFSP	11 (29.7)	5 (27.8)	6 (31.6)	0.06	.800
Screening measures					
Percent ranked 1st	33 (86.8)	15 (78.9)	18 (94.7)	2.07	.150
Aggressive Behavior Scale *M(SD)*	22.3 (6.2)	22.4 (6.7)	22.2 (6.0)	0.10	.919
Adaptive Behavior Index *M(SD)*	22.1 (3.8)	22.6 (3.4)	21.5 (4.2)	0.94	.354
Maladaptive Behavior Index *M(SD)*	31.0 (5.7)	31.4 (4.7)	30.6 (6.6)	0.40	.694

Note. Reported test statistics are *t* for continuous and χ^2 for dichotomous measures. IFSP = Individual Family Service Plan.

Table 3

Descriptive Statistics for Intervention Process Measures

	Classroom *M(SD)*			HomeBase *M(SD)*	Overall
	Coach	**Teacher**	**Combined**	**Parent**	
Protocol Adherence	.95 (.07)	.96 (.08)	.95 (.07)	--	.95 (.07)
Quality of Implementation	.94 (.05)	.80 (.16)	.87 (.08)	.61 (.36)	.80 (.14)
Dosage	--	--	.93 (.14)	.86 (.23)	.89 (.14)
Compliance	--	--	.90 (.13)	.56 (.44)	.79 (.23)
Alliance	4.45 (.68)	4.88 (.27)	--	--	4.67 (.43)
Satisfaction	--	4.32 (.63)	--	4.51 (.57)	4.39 (.47)

Table 4

Baseline and Posttest Means and Standard Deviations for Outcome Measures by Condition and Regression Results

Domain / measure	Control (n = 19)			Intervention (n = 19)			Condition effect		Effect size
	Baseline	Posttest		Baseline	Posttest				
	M(SD)	*M(SD)*	M_{Adj}	*M(SD)*	*M(SD)*	M_{Adj}	Test statistic	*p*-value	Hedges' *g*
Internalizing behavior									
SSiS-INT-T	6.3 (3.5)	5.0 (2.5)	4.8	5.3 (3.7)	3.5 (2.7)	3.7	−1.69	.091	0.42
SSiS-INT-P	10.2 (5.6)	9.6 (5.4)	8.7	7.6 (3.9)	6.6 (4.7)	7.5	−0.91	.363	0.23
Externalizing behavior									
SSiS-EXT-T	19.4 (7.4)	16.4 (6.4)	15.7	17.6 (4.9)	11.8 (5.7)	12.2	−2.33	.020	.059
SSiS-EXT-P	19.9 (8.8)	18.1 (8.3)	18.2	19.7 (5.8)	13.5 (4.8)	13.8	−3.07	.002	0.66
ESP-MBI-T	29.1 (6.6)	26.0 (7.2)	26.2	28.2 (7.0)	21.3 (6.2)	21.5	−2.55	.011	0.70
ESP-ABS-T	21.6 (7.8)	20.3 (10.2)	19.4	18.9 (5.6)	12.9 (3.1)	13.5	−2.50	.012	0.79
Social functioning									
ESP-ABI-T	23.9 (4.3)	26.8 (5.9)	26.3	24.2 (4.4)	31.1 (5.2)	31.0	2.82	.005	0.85
SSiS-SS-T	77.6 (12.4)	86.6 (16.0)	86.4	77.4 (8.7)	95.4 (13.5)	95.4	2.51	.012	0.60
SSiS-SS-P	90.4 (11.1)	93.6 (13.1)	94.2	88.6 (11.4)	102.3 (14.5)	102.6	2.45	.014	0.61