

**Efficacy of Enhanced First Step to Success Intervention for Tertiary-Level
Students with Disruptive Behavior (R324A150179)
Research Performance: Final Report**

In May 2015, the University of Louisville, in collaboration with several Kentucky school districts and the Oregon Research Institute, was awarded a four-year, collaborative federal grant to evaluate the efficacy of the revised First Step Next (FSN) early intervention program (Walker, et al., 2015). The purpose of this project was to conduct a comparative efficacy study examining the impact of (1) a school-based intervention (First Step Next; FSN) to support teachers and their students and (2) a home-based intervention (homeBase) to support parents. The study focused on students with disruptive behavior who require tertiary-level (intensive) support to achieve school success. This final report summarizes our findings to date. *Throughout this report, we provide full citations and abstracts for articles that have been accepted for publication or published. Further, we provide working citations and working abstracts for manuscripts under review or in process. For articles that have been accepted for publication or published, as well as manuscripts under review or nearly ready for submission, we have uploaded them in the Additional Information section of this report. These publications are nested within each of our four study aims.*

I. Accomplishments

What were the aims for the study?

1. Examine the magnitude of immediate, pre-post effects for First Step Next-only, homeBase-only, and First Step Next -plus- homeBase interventions.
2. Examine the maintenance of gains for the First Step Next-only, homeBase-only, and First Step Next -plus- homeBase interventions.
3. Examine mediators and moderators of student-level intervention effects and the relationship among implementation measures and positive change on parent and teacher outcomes.
4. Identify facilitators and barriers to adoption, implementation, and sustainability of First Step Next and homeBase within and across participating schools.

Aim 1. Examine the magnitude of immediate, pre-post effects for First Step Next-only, homeBase-only, and First Step Next -plus- homeBase interventions

The results of our immediate, pre-post comparative study of intervention effects are currently revised and resubmitted after a favorable review by the editor and reviewers from *Exceptional Children*.

Working citation

Frey, A.J., Small, J.W., Seeley, J.R., Walker, H.M., Feil, E.G., H.M, Lee, J. Cohen Lissman, D., Crosby, S., & Forness, S.R. (2021). First Step Next and homeBase: A comparative efficacy study of children with disruptive behavior. *Submitted for publication*.

Working abstract

Disruptive behavior disorders in childhood are increasingly pervasive and associated with numerous, negative long-term outcomes. The current study examined whether adding a brief, home-visitation intervention to an existing, multi-component (child and teacher components) intervention, would improve social-emotional and behavioral outcomes for young children with challenging behavior in home and school settings who required intensive support. Three hundred seventy-nine teacher-parent-student triads were screened for elevated levels of behavioral risk in school and home settings and then randomly assigned to school only intervention (i.e., teacher and student components), home only intervention (i.e., parent), combined, or business-as-usual control conditions. We examined baseline and posttest outcomes across prosocial behavior, problem behavior, and academic domains. Specifically, we calculated a dichotomous variable capturing clinically meaningful improvement from baseline to post (e.g., movement from the clinical range to borderline or normative range or movement from the borderline range to normative range) and reported the odds ratio for three DSM-oriented types of behavior, ADHD, CD, and Oppositional Defiant Disorder (ODD). The analysis indicated those in the FSN condition were 3.0 times more likely than students randomized to the control arm to make statistically significant improvement in ADHD problems and 2.3 times more likely in CD problems. FSN's effects on ODD did not reach statistical significance. Although hB was not effective in improving ADHD, CD, and ODD when offered on its own, when added to FSN in the combined intervention arm, effects were stronger than when FSN was offered alone. Specifically, students were 5.0 times more likely than control students to make improvement on teacher-reported ADHD problems and 3.2 times more likely to improve on teacher-reported CD problems, though effects on ODD remained not statistically significant. The results demonstrated substantial support for the teacher and child-focused condition, combined conditions, and modest support for the parent only-focused condition. The study advances the literature by increasing the knowledge base related to these interventions alone and in combination.

Aim 2. Examine the maintenance of gains for the First Step Next-only, homeBase-only, and First Step Next -plus- homeBase interventions

Our team has conducted a preliminary analysis of our maintenance gains. Below, we present the working citation and abstract for a manuscript we hope to submit in August 2021. Since we have not yet formally analyzed the data, we have also included two figures that visually depict the results.

Working citation

Frey, A.J., Small, J.W., Seeley, J.R., Walker, H.M., H.M, Skidmore, B, & Forness, S.R. Examination of maintenance gains for the First Step Next-only, homeBase-only, and First Step Next -plus- homeBase interventions.

Working abstract

Conduct problems and disruptive behavior disorders that develop in early childhood are common. If challenging behaviors surface in early childhood, they are stable across the lifespan if not addressed, but also predictive of negative mental health outcomes later in life, including school failure, substance abuse, poor employment, mental health problems, and criminality (Briggs-Gowan & Carter, 2008; Colman et al., 2009). Interventions that provide support for students who are moderately or severely at risk for school failure due to deficits in social emotional development have documented some impressive immediate, post intervention results. A few school-based, Tier 2 or Tier 3 interventions, such as BEST in CLASS (Conroy et al., 2015), the Teaching Pyramid (Fox et al., 2003) and First Step Next (FSN; Walker et al., 2015; Feil et al., 2014) have been successful in increasing social skills and reducing challenging behavior immediately following intervention. But documenting maintenance gains following intervention delivery has remained elusive. In this study, we examined 6-month follow up results for students who participated in a large-scale efficacy trial of the FSN and homeBase (hB) interventions (Frey et al., 2021). Three hundred seventy-nine teacher-parent-student triads from 100 schools in five districts in Kentucky and Indiana participated in the comparative efficacy trial across five cohorts. We collected six-month follow-up questionnaire data from parents to assess the child's social-emotional functioning and problem behaviors in the home environment. In total, 220 of 379 parents (58%) completed a questionnaire at follow up. There were no statistically significant differences in participation rates by cohort ($\chi^2[4] = 5.19, p = .268$) or by condition ($\chi^2[3] = 1.51, p = .680$). At follow up, 59% of parents in the FSN+hB condition (n = 55); 62% in FSN only (n = 58); 53% in hB only (n = 51); and 59% in the control condition (n = 56) participated. Participants with and without follow-up data differed on two parent characteristics. A higher percentage of parents who were female (93% vs. 86%) and had a college degree (18% vs. 9%) completed a follow up questionnaire. Based on student demographic data, fewer parents with younger students participated and, in particular, disproportionately fewer parents of students who were in Kindergarten at baseline completed a follow-up survey (19% vs. 33%). Figures 1 and 2 summarize improvements through six months for our two-primary parent-reported outcomes. Children in the FSN only, hB only, and FSN+hB conditions maintained gains or made further improvement through six-month follow-up according to parent reports.

Figure 1. Parent-reported standard scores from baseline to 6-month follow-up.

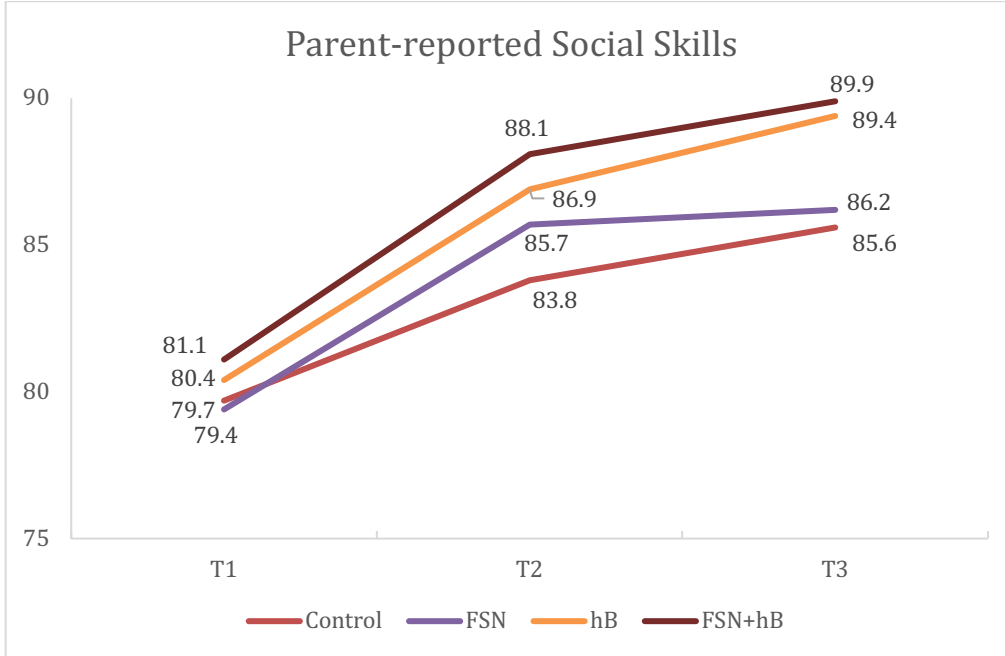
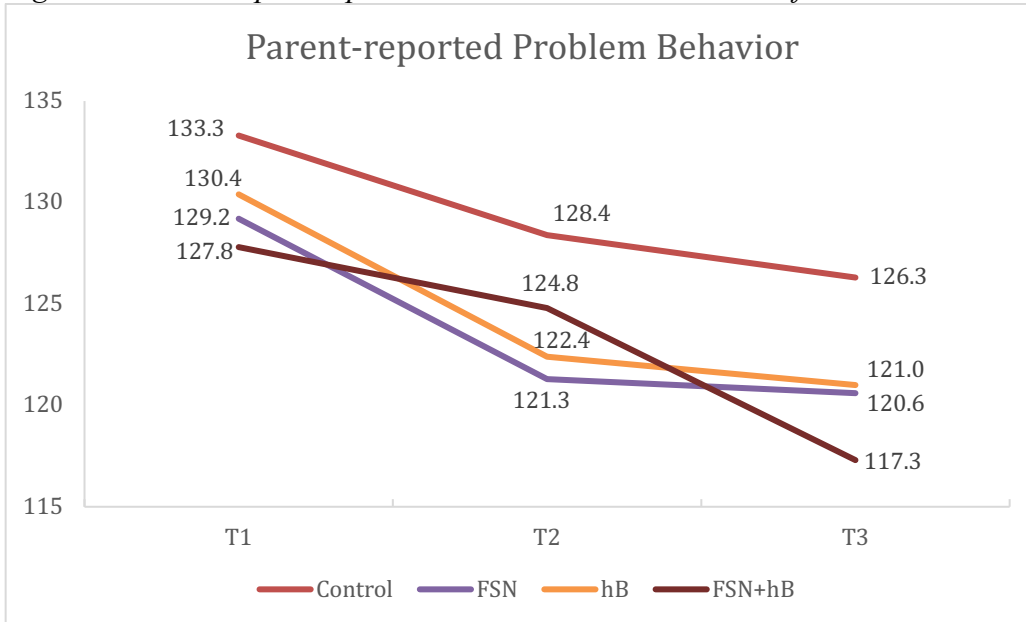


Figure 2. Parent-reported problem behavior standard scores from baseline to 6-month follow-up.



Aim 3. Examine mediators and moderators of student-level intervention effects and the relationship among implementation measures and positive change on parent and teacher outcomes

There are three manuscripts currently in progress related to our third aim. The working citations and abstracts are provided below. They are listed in the order in which we anticipate submitting them for review.

Working citation

Small, J. W., Frey, A. J., Seeley, J. R., Cohen-Lisman, D., Walker, H. M., & Forness, S. Does Risk for Comorbid Psychiatric Disorders Moderate Treatment Response for Disruptive Behavior? Findings from an efficacy trial of First Step Next with Elementary School Students.

Working abstract

Disruptive behavior disorders (DBDs) such as oppositional defiant disorder (ODD) and conduct disorder (CD) have an onset during the early school years and rarely occur without other comorbid disorders. Common comorbidities for children with DBDs include Attention-Deficit Hyperactivity Disorder (ADHD), depression, and anxiety (Greene, 2010; Noordermeer et al., 2017; Patalay et al., 2017; Stringaris et al., 2010; Wertz et al., 2018; Willner et al., 2016). Between 40% and 75% of children with DBDs also have comorbid ADHD and internalizing disorders (Hersen & Sturmey, 2012). These comorbidities, in turn, contribute to variation in the presentation and severity of children's disruptive behaviors. Children with co-occurring DBDs and ADHD, for example, tend to have more severe antisocial behavior, greater interpersonal difficulties, lower verbal and social-cognitive skills, and increased academic struggles (Greene, 2010; Hersen & Sturmey, 2012). Findings from several studies suggest comorbidity also may result in differential treatment effects. In the Multimodal Treatment of ADHD Study (MTA), children with comorbid ADHD and disruptive disorders (e.g., ODD or CD) responded better to treatments combining medication and behavioral intervention and children with comorbid ADHD and internalizing disorders responded equally well to either intervention. In contrast, children with comorbid ADHD, a DBD, and an internalizing disorder had limited response to even a combination of treatments (Roy et al., 2016; 2017). In the Child/Adolescent Anxiety Multimodal Study (CAMS), comorbid depression or other anxiety disorders significantly reduced the probability of achieving remission as did comorbid internalizing disorder (Compton et al., 2014; Ginsburg et al., 2011; Ginsburg et al., 2014). As well, in the Treatment for Adolescent Depression Study (TADS), comorbidity with ADHD, ODD, or CD adversely affected outcomes (Curry et al., 2006). In this paper, we examine differential treatment response for students who participated in a large-scale efficacy trial of the First Step Next and homeBase interventions (Frey et al., 2021). More specifically, we examine whether baseline comorbidity (i.e., DBD only, DBD + ADHD, DBD + anxiety, and DBD + depression) moderates our primary intervention outcomes. The four comorbidity groups were identified using the DSM-oriented scales from the Child Behavior Checklist (CBCL) and Teacher Report Forms (TRF; Achenbach & Rescorla, 2001). Using clinical cutoffs from the CBCL and TRF, 31% of students were in the DBD only group; 27% were in the DBD + ADHD group; 22% were in the DBD + anxiety group; and 20% were in the DBD + depression group. We hypothesize that students in the comorbid DBD and anxiety group will respond better than students who are in the other groups (e.g., anxiety will function as a protective factor) and that students in the comorbid DBD and depression group will not respond. We also hypothesize that students with only a DBD will respond better than students who are in the comorbid DBD and ADHD group.

Working citation

Lee, J., Small, J., Johnson, L., Frey, A., Skidmore, B., & Iachini, A., et al. Exploring the Mechanisms of Motivational Interviewing through homeBase: An Intervention for Parents with Children at risk for developing severe behavior disorders.

Working abstract

The prevalence of Motivational Interviewing (MI) used as an intervention within educational settings has been on the rise since the publication of *The Promise of Motivational Interviewing in School Mental Health* (Frey et al., 2011). In particular, a wide variety of interventions utilizing MI have been developed and implemented with members of the educational community; including parents, teachers, and adolescents. Progress has been made in the development of the training, assessment, and fidelity systems necessary to support the adoption of MI by school personnel as a targeted intervention strategy; while federal research funding and the publication of research related to MI and its use in schools has grown steadily. Yet, the mechanisms by which MI supports the behavioral change outcomes of those members of the educational community who experience it remains elusive. The conversational application of MI skill, process, and spirit within educational practice may differ from those within clinical settings. Thus, research on the use of MI from within the educational community is necessary for the continued improvement of MI training, assessment, and fidelity systems that are applied within educational contexts. Herein, we report the findings from a sequential analysis of audio-recorded interactions between a well-trained MI coach and the parents of children with externalizing behavior challenges. The homeBase intervention includes up to six, 60-minute sessions (i.e., home visits) and is designed to increase parent motivation and enhance their capacity to implement effective parenting practices. During homeBase, parents engage with the MI coach to examine their parenting practices and consider modifying those practices to be consistent with five universal principles of positive behavior support that are central to the intervention. Approximately 250 audio recordings were analyzed using transcripts and commercially available coding software. Each audio recording had been previously coded by an independent team of coders for fidelity and quality using the MITI 4.2. Coach codes included MI behavior counts as defined by the Motivational Interviewing Treatment Integrity (MITI 4.2) code. Parent codes were adapted from the Motivational Interviewing Skills Code (MISC 2.1). We report on the frequency of coaches' MI behavior and the corresponding responses from parents during the intervention. The project aims to identify coach behaviors that lead to the expressed motivation of parents towards positive change in support of their child (i.e., change talk); thus, allowing for the identification and comparison of those mechanisms of MI from educational applications that may be similar or differ from those known to be associated with more clinical applications. The primary hypothesis is that MI proficiency is associated with parents' talk about change. The following questions related to this hypothesis will be examined: (a) proficient use of MI technical skills are associated with increases in change talk and decreases in sustain talk, (b) MI-inconsistent practices are associated with increases in sustain talk and decreases in change talk, and (c) MI relational skills are related to neither change talk nor sustain talk. Further, we will examine whether (a) MI relational skills moderate the relationship between technical skills and talk about change and (b) baseline levels of behavior change sought, or participant characteristics as a moderate of technical skills and talk about change.

Working citation

Cohen-Lisman, D, Seeley, J.R., Frey, A.J., Small, J.W., Lee, J., et al. Impact of MI proficiency on dosage, parental engagement and alliance, and parent and child outcomes: A contemporary mediation analysis.

Working abstract

Engaging participants in service delivery is a substantial barrier interfering with the uptake and impact of evidence-based interventions for students with emotional and behavioral disorders (EBD) in general (Krathochwill, 2007) and within the context of parent-focused interventions specifically (Eames, et al., 2009; Frey, et al., 2013). Similarly, school-based interventions encounter unique layers compounding parental engagement (Goldman & Burke, 2017). Many caregivers have low motivation to initiate participation in interventions (see Herman et al., 2012; Reinke et al., 2012). Research has documented factors that influence family engagement, including socioeconomic disadvantage, ethnic minority status, severity of child dysfunction, caregiver stress and depression, lack of support (including caring for children and elderly caregivers), family member resistance, lack of parenting knowledge and skills, and lack of confidence (McKay et al., 2004; Nock & Kazdin, 2001). These characteristics are likely mediated by the structural and cultural contexts in which the intervention is delivered, and understanding this context is critical to our ability to design and deliver interventions that decrease the likelihood these characteristics will exacerbate motivational issues affecting engagement and implementation fidelity. Motivational Interviewing has recently been leveraged by several research groups in the field of EBD (Herman et al., 2021; Frey et al., 2021; Small et al., 2021). There are several active ingredients embedded in MI practice designed to increase caregiver engagement, including the relational component, technical component, and the absence of MI inconsistent practices. MI research conducted in settings outside of schools has shown the importance of MI fidelity to both engagement in service delivery and outcomes (Miller & Rollnick, 2015), but little research has examined this with school-based service delivery to understand the relationship between MI fidelity, parental engagement, and improved parent and child outcomes. The current study builds upon Frey et al. (2019), which examined parental engagement and social validity of the homeBase intervention. This descriptive analysis demonstrated that parental participation was challenging in that 21% of the parents seemed unable to engage at all in the intervention. However, those who did participate were highly engaged and developed effective relationships with their coach. Further, parents who did participate in the homeBase intervention perceived it to be socially valid. The current study will include 190 parents and students randomized to receive the homeBase in the context of a larger RCT. We will conduct a contemporary mediation analysis to assess the following research questions: (1) Does MI/coach fidelity improve parent and child outcomes?, (2) Does MI/ coach fidelity increase parent engagement?, (3) Does MI/ coach fidelity increase parent coach alliance? And (4) Does parent engagement improve parent and child outcomes?

Aim 4. Identify facilitators and barriers to adoption, implementation, and sustainability of First Step Next and homeBase within and across participating schools

We have one published article, one manuscript in press, one manuscript under review, and two manuscripts nearly ready for submission related to aim #4.

Citation

Frey, A.J, Small, J.W., Lee, J., Crosby, S., Seeley, J.R, Forness, S., & Walker, H.M. (2019). homeBase: Participation, engagement, alliance, and social validity of a motivational parenting intervention. *Children & Schools*. Advance online publication. <http://doi.org/10.1093/cs/cdz016>

Abstract

This manuscript examines the participation, engagement, alliance, and social validity of the homeBase intervention. homeBase is a parent management intervention that was developed specifically to address parent engagement of elementary level students. The intervention infuses motivational interviewing into its implementation procedures and trains behavioral coaches to use this conversational approach as their primary interactive vehicle with parents. Process data from participants assigned to one of the two homeBase intervention conditions (N = 120) were examined to better understand the following dimensions: *parental participation and engagement, coach-parent alliance, and satisfaction with the homeBase intervention*. To assess participation, we report the number of home visit sessions parents completed. Engagement was examined using coach-reported engagement ratings and alliance was assessed via parent- and coach-reported ratings. Satisfaction was examined using a survey with parents. Results demonstrated that parental participation was challenging in that 21% of the parents seemed unable to engage at all in the intervention. However, those who did participate were highly engaged and developed effective relationships with their coach. Further, parents perceived the homeBase intervention to be socially valid. There were also several interesting correlations among these measures that might potentially guide further research and practice. The authors recommend school social work preparation programs and school districts consider the inclusion of motivational interviewing in curriculum and professional development efforts as a useful strategy for parental engagement.

Citation

Small, J., Frey, A., Lee, J. Seeley, J.R., Scott, T.M, & Sibley, M.H. (in press). Fidelity of motivational interviewing in school-based intervention and research. *Prevention Science*.

Abstract

As noted, educational researchers and school-based practitioners are increasingly infusing Motivational Interviewing (MI) into new and existing intervention protocols to provide support to students, parents, teachers, and school administrators. To date, however, the majority of the research in this area has focused on feasibility of implementation rather than fidelity of implementation. In this manuscript, we will present MI fidelity data from 245 audio-recorded conversations with 113 unique caregivers and 20 coaches, who implemented a school-based, positive parenting intervention. The aggregate fidelity scores across coaches, parents, and sessions provided evidence that the training and support procedures were effective in assisting school-based personnel to implement MI with reasonable levels of fidelity in practice settings. Further, results suggest that MI fidelity varied between sessions and coaches and that within-coach variation (e.g., session-level variation in the quality of MI delivered) greatly exceeded

between-coach variation. Across the 245 sessions, mean scores on the MITI global technical scale were in the basic fidelity range (e.g., ≥ 3.0). For all but seven sessions (97%), coach use of technical MI skills were above the basic fidelity threshold. On average, scores on the global relational scale were also in the basic fidelity range. For nearly 80% of sessions, global relational scores were above the basic fidelity threshold. For complex reflections and reflections-to-questions summary scores, 87% and 60% of sessions, respectively, exceeded basic fidelity thresholds. For 117 sessions, basic fidelity thresholds were met on all four MITI scores (48%). For 40 sessions, advanced fidelity thresholds were met across all four scores. For three sessions (1%), basic fidelity thresholds were not met for any of the MITI summary scores. Mean technical proficiency scores at the coach level ranged from 3.2 to 4.3; whereas mean scores for relational proficiency ranged from 2.7 to 4.4. Average complex reflections by coach ranged from 33% to 77%. The reflections-to-questions ratio ranged from a low of 0.1 (e.g., one reflection for every 10 questions) to a high of 3.4 (e.g., 3.4 reflections to each question). Across the four summary scores, coaches with more than 10 sessions of MITI data had mean scores comparable to coaches with fewer than 10 sessions of MITI data. With respect to session-level categorical cutoffs (e.g., all sessions above the specified cutoff), coaches with more than 10 sessions of MITI data were less likely to have all of their session above basic or advanced cutoffs as compared to coaches with fewer than 10 sessions of MITI data; though these differences were non-significant across all measures. To estimate the proportion of variance attributable to MI sessions (level 1), the families receiving hB support (level 2), and the coaches providing support (level 3), we fit unconditional three-level, random intercept models for each MITI summary score. Across all four models, between-session variability was the highest. Variance between sessions for the global and behavioral summary scores accounted for between 64% and 91% of variability. Variance between coaches accounted for 13% to 29% of variability. In contrast, between family variability accounted for only between 7% and 9% of variability. The ICCs indicate that between 30% and 37% of total variation in MITI technical and relational scores over time was attributable to variation at the family and coach level but that the majority of this variation was attributable to the coach level. Specifically, between 77% and 79% of higher-level variability was attributable to the coach-level of the models. Implications for practice and future research are discussed.

Working citation

Frey, A.J., Walker, H.M, Mitchell, B., Small, J.W., Feil, E.G., Forness, S.R., Lee, J., & Crosby, S. (2021). First Step Next: A synthesis of randomized controlled trials. *Submitted to Behavior Disorders*.

Working abstract

School professionals are well aware of the positive impact of early intervention and prevention efforts for successfully reducing disruptive behaviors and the probability of poor developmental outcomes (Hawkins, et al., 1999). Superior early interventions teach and reinforce positive social skills as well as decrease problem behaviors that disrupt the teaching-learning process. Following its development and initial testing in a small scale RCT (Walker, et al., 1998), the First Step intervention was validated in a large-scale study conducted in the diverse Albuquerque School District (Walker, et al., 2009) and via a national effectiveness study conducted by Sumi et al., (2013). First Step is designed for application within early childhood general education settings (preschool and primary grades). In the present article, we review and synthesize five randomized controlled trials conducted between 2009-2021 that include efficacy and effectiveness studies and several subsample analyses demonstrating impact across a range of disorders, settings and diverse populations. Collectively, these studies show that the First Step intervention has resulted in small to large effect sizes and statistically significant improvements,

compared to students randomized to control conditions, on multiple indicators of prosocial behavior and problem behavior. These results demonstrate the versatility of the intervention across elementary and preschool populations. It should be noted that each of the RCTs conducted in elementary schools yielded relatively small effect AET sizes and statistically significant improvements, compared to students randomized to control conditions. Academic engaged time is both a direct observation measure and a relatively distal outcome in the FS logic model since it is not targeted by the intervention directly. It is important to note the consistency of these findings across populations, as well as across efficacy and effectiveness trials. In each of the five RCTs, the impact of the intervention has been more robust in the school than in the home setting, as indicated by teacher- versus parent-reports on the SSiS measures. As is to be expected, when an intervention is delivered by end user school personnel rather than research staff, the impact of the lone effectiveness study produced slightly less robust effect sizes than the reported efficacy studies. This synthesis also provides some evidence that the FS intervention has a similar impact on preschoolers and elementary aged students. Additionally, the synthesis of the subsample populations suggests the FS intervention can be expected to have at least as robust effects with students with or at risk of having a variety of DSM diagnoses. Finally, it is important to note that effect sizes for FS in this synthesis tend to be comparable to, if not slightly larger than, those produced in a meta-analysis of 36 RCTs on psychosocial interventions for preschoolers with disruptive behavior (mean age of 4.7 years) by Comer and colleagues (2013); and a similar meta-analysis of 28 RCTs for young elementary-age children (mean age of 8.2 years) by Epstein and colleagues (2015). These results help demonstrate the effective range of the First Step intervention.

Working citation

Kuklinski, M., Small, J.W., Frey, A.J., Forness, S. Bills, K., Walker, H.M. et al. Comprehensive Cost Effectiveness of a school- and home-based interventions for Elementary School students with Disruptive Behavior Disorders. *To be submitted to Journal of Emotional and Behavioral Disorders.*

Working abstract

Prevalence rates of Conduct Disorder (CD) and Attention Deficit Hyperactivity Disorder (ADHD) are the most likely to receive services from specialized instructional support personnel because of their potentially disruptive symptoms, and they have spurred examination of the efficacy of various intervention options. In this paper, we examine whether First Step Next (FSN) or FSN + homeBase (hB) is more cost-effective in treating disruptive behavior problems for students who participated in a large-scale efficacy trial of the interventions (Frey et al., 2021). Three hundred seventy-nine teacher-parent-student triads from 100 schools in five districts in Kentucky and Indiana participated in the comparative efficacy trial across five cohorts. Intervention costs were estimated using an activities-based Ingredients Method (Levin & McEwan, 2001). Comparative cost effectiveness analyses involved calculating incremental cost-effectiveness ratios (ICERs) for (a) FSN in relation to a business-as-usual control condition and (b) FSN + hB in relation to a control condition. As in Frey et al. (2019), we calculated both average costs per student and the additional cost of serving one more student with FSN or hB. We defined response to intervention as movement from the borderline range into the normative range or from the clinical range into the borderline or normative range at post-intervention. ICERs for (a) FSN compared to control and (b) FSN + hB compared to control were estimated as incremental costs divided by incremental gain in students who responded. The average cost of delivering FSN initially was \$3,387 per student, with costs of serving an additional student once the intervention is in a steady state being \$2,538. Average costs per student for the combined intervention were estimated at \$3,960 initially, and

\$2,731 after capacity was established. For each of the three clinical outcomes at posttest, more students in the FSN and combined FSN + hB arms had improved, compared to students randomized to the control arm. These differences were statistically significant at a type 1 error rate of .05 and suggest that both approaches were effective in reducing externalizing behavior disorders, including comorbid ADHD and CD. With respect to cost-effectiveness, the combined intervention was always more cost-effective among three diagnostic outcomes. ICERs for ADHD were \$12,442 for FSN compared to \$8,509 for the combined intervention. For CD, the ICERs were \$14,672 for FSN compared to \$11,058 for the combined intervention. For comorbid ADHD and CD, they were \$16,877 for FSN compared to \$12,147 for the combined intervention. Across all three outcomes, the incremental cost per case was approximately \$3,600 to \$4,700 lower for the combined intervention. Findings indicate that improvement in comorbid ADHD and CD was the most costly to achieve, followed by CD, and then ADHD. However, in all cases the small increase in cost to add the homeBase component was more than offset by the stronger response to the intervention. Sensitivity analyses in which average costs per student were utilized in the ICERs led to the identical conclusion that the combined intervention was always more cost-effective. This study expands the literature base by examining the costs of implementing FSN and hB when applied with elementary students and comparing the cost effectiveness of delivering the FSN intervention alone and in combination with hB. Overall, results suggest the cost of implementing FSN in elementary settings was similar to the costs when implemented in preschool settings (Frey et al., 2019). Further, the current study suggests that when choosing whether to implement FSN or the combined (FSN+hB) intervention, the combined intervention is a better investment of limited resources. Though it costs more per student, the value added in terms of student response more than offsets the cost.

Working citation

Lee, L., Frey, A., Small, J, Crosby, S, & Suldo, S. (2021). Promoting initial MI skill development. School-based personnel can learn to use motivational interviewing skills. Manuscript in progress.

Working abstract

Motivational Interviewing is an evidence based conversational intervention focusing on client behavior change in order to ameliorate or moderate the consequences of maintaining child behaviors with negative outcomes. As such, Motivational Interviewing is well situated within the purposes of prevention science. The use of motivational interviewing in educational practice and research has increased over the past several years as a novel approach for trained practitioners to intervene with individuals facing a wide range of motivational challenges as they work to resolve ambivalent feelings regarding changing behavior patterns for the betterment of themselves or their children. The Motivational Interviewing Training and Assessment System was designed to facilitate the successful transportation of motivational interviewing to educational settings by providing training and measurement tools contextualized for a variety of school-based audiences, applications and personnel. In the current study, we trained and evaluated the initial skill development repertoires of 17 interventionists within the context of the *homeBase* intervention; a school-based intervention to support positive parenting. In addition, we trained seven interventionists within the context of the *Motivation, Assessment, and Planning (MAP)* intervention a school-based intervention to support academic success. Specifically, we examined motivational interviewing self-efficacy and motivational interviewing competency before and after training. Further, we assessed interventionist satisfaction with the training via a focus group interview and survey responses. Results demonstrate interventionists entered training with highly variable motivational interviewing competency, and most interventionists established

acceptable competency thresholds following participation in the training. Qualitative data also suggest the interventionists were highly satisfied with the training. Implications for future motivational interviewing training of school-based interventionists are discussed.

What opportunities for training and professional development has the project provided?

Over the course of the study, we trained approximately 35 interventionists and 40 data collectors. Our staff included a diverse group of professionals with regard to education, ethnicity, and experience. Specifically, our part-time staff held Bachelor's and Master's degrees, and some were current students (masters and doctoral). Staff degrees represented the fields of Social Work, Education and Psychology. The experience category included those working in community mental health, education, and research contexts. We also utilized several retired teachers and education administrators as interventionists. Roles were sometimes shared between implementing the interventions, consenting parents, completing classroom observations, and collecting other data. This allowed us to utilize the variety of skills our staff possessed to assist with meeting project goals, while it also gave them the opportunity to gain a broader view of the project and new research experience. Interventionists did not serve as data collectors for any cases on which they were also serving as the interventionist. Seventeen behavioral coaches were trained to use motivational interviewing strategies with parents and were provided continuous professional development from research staff to improve their skills. Twenty behavioral coaches were trained to lead the implementation of the FSN intervention with teachers, students, and parents. We provided professional development to approximately 250 classroom teachers (190 teachers and 60 assistants/support staff) to implement FSN with fidelity.

Have the results been disseminated to communities of interest?

We submitted annual district reports every year until 2020. We are preparing a final report that will be shared with all of our district partners. Additionally, we were part of research symposiums at the 2019 and 2020 School Mental Health conference (Austin, TX) and also presented at the 2020 Council for Exceptional Children (Portland, OR) conference.

In accordance with IES's *Policy Statement on Public Access to Data Resulting from IES Funded Grants* (https://ies.ed.gov/funding/datasharing_policy.asp), we are planning to upload the data set for this grant upon acceptance of the main effects study from this proposal. We are currently revising and resubmitting the main effects manuscript to *Exceptional Children* and anticipate acceptance of the paper by July 2021, if not sooner. We will upload the final dataset to the University of Michigan's Institute for Social Research (ICPSR) data repository given that the University of Louisville is a member institution. ICPSR ensures long-term availability of the data and worldwide dissemination. At this time, we are finalizing a data set for this study. The final data set will include de-identified student level outcome and process data. Data will be uploaded in a portable data file compatible with multiple statistical software packages (e.g., SPSS, SAS, R). Once we have uploaded the final data set, we will notify our program officer and include documentation from ICPSR confirming receipt and upload of the data.

We have continued to edit a formal dissemination plan to guide conference and manuscript development. A working list of articles, manuscripts under review and manuscripts in process are provided below. An * indicated the product has been uploaded in the Additional Information section of this report. Further, those submitted or in press have been submitted to ERIC and are currently being reviewed for indexing.

Published or in press

- *Frey, A.J., Small, J.W., Lee, J., Crosby, S., Seeley, J.R., Forness, S., & Walker, H.M. (2019). homeBase: Participation, engagement, alliance, and social validity of a motivational parenting intervention. *Children & Schools*, p. doi: 10.1093/cs/cdz016.
- *Small, J., Frey, A., Lee, J., Seeley, J.R., Scott, T.M., & Sibley, M.H. (in press). Fidelity of motivational interviewing in school-based intervention and research. *Prevention Science*.

Submitted for publication

- *Frey, A.J., Small, J.W., Seeley, J.R., Walker, H.M., Feil, E.G., H.M, Lee, J. Cohen Lissman, D., Crosby, S., & Forness, S.R. (2021). First Step Next and homeBase: A comparative efficacy study of children with disruptive behavior. *Submitted to Exceptional Children*.
- *Frey, A.J., Walker, H.M, Mitchell, B., Small, J.W., Feil, E.G., Forness, S.R., Lee, J., & Crosby, S. (2021). First Step Next: A synthesis of randomized controlled trials. *Submitted to Behavior Disorders*.

In process

- *Kuklinski, M., Small, J.W., Frey, A.J., Forness, S. Bills, K., Walker, H.M. et al. Comprehensive Cost Effectiveness of a school- and home-based interventions for Elementary School students with Disruptive Behavior Disorders. *To be submitted to Journal of Emotional and Behavioral Disorders*.
- *Lee, L., Frey, A., Small, J, Crosby, S, & Suldo, S. (2021). Promoting initial skill development. School-based personnel can learn to use motivational interviewing skills. Manuscript in progress.
- Lee, J., Small, J., Johnson, L., Frey, A., Skidmore, B., & Iachini, A. Exploring the Mechanisms of Motivational Interviewing through homeBase; an Intervention for Parents with Children at risk for developing severe behavior disorders. Manuscript in progress.
- Frey, A.J., Small, J.W., Seeley, J.R., Walker, H.M., H.M, Skidmore, B, & Forness, S.R. (2021). Examination of maintenance gains for a parent-based intervention for young children with challenging behavior. Manuscript in progress.
- Cohen-Lisman, D, Seeley, J.R., Frey, A.J., Small, J.W., & Lee, J. Impact of MI proficiency on dosage, parental engagement and alliance, and parent and child outcomes: A contemporary mediation analysis. Manuscript in progress.
- Small, J. W., Frey, A. J., Seeley, J. R., Cohen-Lisman, D., Walker, H. M., & Forness, S. Does Risk for Comorbid Psychiatric Disorders Moderate Treatment Response for Disruptive Behavior? Findings from an efficacy trial of First Step Next with Elementary School Students. Manuscript in progress.

II. Products

See answer to “how have results been disseminated” question above.

III. Participants and Other Collaborating Organizations

What individuals have worked on the project?

Name: Andy Frey

Project role: PI

Nearest month worked: 3

Contribution to the Project: Dr. Frey supervised all of the research managers, oversaw the budget and IRB processes, and was responsible for school recruitment. As an expert on implementation of First Step Next and homeBase, he coordinated, supervised and recorded fidelity data on implementation. He also assisted with the training of coach interventionists and participating teachers. He remains active in the dissemination work that remains in process, highlighted in section I.

Name: John Seeley

Project role: Co-PI

Nearest month worked: 2

Contribution to the Project: Dr. Seeley was our senior methodologist. He participated in weekly team meetings and led all efforts related to our measurement protocol and the processing and analyzing of project data. He remains active in the dissemination work that remains in process, highlighted in section I.

Name: Hill Walker

Project role: Co-I

Nearest month worked: 1

Contribution to the Project: Dr. Walker participated in weekly team meetings and advised our team on matters related to measurement and implementation of the First Step NEXT intervention. He was the principal developer and senior author of First Step Next and remains instrumental in our ongoing dissemination efforts.

Name: Jason Small

Project role: Co-I

Nearest month worked: 4

Contribution to the Project: Mr. Small prepared all data collection forms and oversaw the data preparation and analysis processes. He served as the primary liaison between the University of Louisville and the Oregon Research Institute. He remains active in the dissemination work that remains in process, highlighted in section I.

Name: Jon Lee

Project role: Co-I

Nearest month worked: 1

Contribution to the Project: Dr. Lee led our efforts related to motivational interviewing. Specifically, he was our lead interventionist trainer, managed data collection on our interventionists' skills, and worked closely with Ms. Miller, Ms. Johnson, and Mr. Skidmore to provide effective professional development. He remains active in the dissemination work that remains in process, highlighted in section I.

Name: Ed Feil

Project role: Co-I

Nearest month worked: 1

Contribution to the Project: Dr. Feil participated in weekly team meetings. He remains active in the dissemination work that remains in process, highlighted in section I.

Name: Annemeike Golly

Project role: Co-I

Nearest month worked: 0

Contribution to the Project: Dr. Golly did not participate in the NCE years.

Name: Shantel Crosby

Project role: Co-I

Nearest month worked: 1

Contribution to the Project: Dr. Crosby led our focus group interviews, including scheduling, facilitation, and analysis. She remains active in the dissemination work that remains in process, highlighted in section I.

Name: Tara Korfhage

Project role: Research manager

Nearest month worked: 10

Contribution to the Project: Ms. Korfhage oversaw all part-time employees, managed the collection of teacher packets, parent packets, student observations, and parent-child interaction recordings. She also managed the teacher screening, parent consent, and incentive distribution procedures. Her work on the project ended June 30, 2020.

Name: Ally Miller

Project role: Research manager

Nearest month worked: 7

Contribution to the Project: Ms. Miller was an interventionist supervisor for the First Step NEXT and homeBase interventions. She was our primary trainer and support professional for interventionists and teachers and supervised the fidelity of implementation through weekly team meetings, ongoing professional development, and the collection of fidelity data. Her work on the project ended June 30, 2020.

Name: Blake Skidmore

Project role: Research Manager

Nearest month worked: 6

Contribution to the Project: Mr. Skidmore was a lead interventionist and supervisor for the First Step NEXT and homeBase interventions. He trained several interventionist teachers, and supervised the

fidelity of implementation through weekly team meetings, ongoing professional development, and the collection of fidelity data.

Name: Kiersten Curry

Project role: Research manager

Nearest month worked: 1

Contribution to the Project: Ms. Curry assisted with data collection, teacher training, interventionist supervision, and the collection of fidelity data. Her work on the project ended June 30, 2020.

Name: Laura Johnson

Project role: Counselor

Nearest month worked: 2

Contribution to the Project: Ms. Johnson was a lead interventionist. She assisted with the collection of follow up data and dissemination efforts until December 2020.

Name: Kristina Hulegaard

Project role: Research Assistant

Nearest month worked: 3

Contribution to the Project: Ms. Hulegaard was responsible for getting our raw data into relational databases.

What other organizations have been involved as partners?

Dr. Margret Sibley at Florida Atlantic and her team coded the audio recordings of our homeBase intervention sessions for fidelity using the Motivational Interviewing Treatment Integrity Tool. Finally, Margaret Kuklinski served as a consultant for our cost analysis.

Have other collaborators or contracts been involved?

Nothing to report.

IV. Impact

This project has assisted the fields of education, psychology, and social work to understand the relative effectiveness of an empirically supported, teacher and student-focused intervention (First Step Next) and a recently developed home-based parent-focused intervention (homeBase) — alone and in combination—for improving students’ social competency, reducing challenging behaviors, and increasing academically engaged time for students with serious behavior problems.

We also learned a great deal about the potential of motivational interviewing applied within the context of school-based interventions, particularly with regard to the supports needed for school personnel to practice this approach with adequate skill levels.

What is the impact on other disciplines?

The information we are learning about First Step Next and homeBase reflects knowledge from multiple relevant disciplines, including education, social work, school psychology, and clinical psychology; and to the many roles personnel from these disciplines assume in the education system. homeBase could also

impact service delivery in community mental health and maternal child health, where improving parenting practices through home visitation is desirable.

What is the impact on the development of human resources?

Our training procedures for both First Step Next and homeBase improved the capacity of teachers and specialized instructional support personnel.

What is the impact on physical, institutional, and information resources that form infrastructure?

Our activities were very impactful for our infrastructure related to the training and support we provide our homeBase coaches, and our physical and institutional support to do the same. Specifically, we developed and continue to improve our procedures for sharing secure information quickly that allow approved staff from various locations full access to the recordings, reports, coding tools, and data necessary for carrying out our efforts related to the use of motivational interviewing in this intervention. We believe this system, after it is fully developed and tested, will continue to benefit our work, as well as that of other professionals working in this area across multiple research and applied practice settings.

What is the impact on technology transfer?

Not applicable.

What is the impact on society beyond science and technology?

The primary impact is on the improvement of the quality of life for the teachers, students, and parents who have benefited from the services provided through this grant. Given the relationship between early school success and long-term outcomes such as graduation, and employment, impacting families early in their school career has long-term positive effects on society.

What dollar amount of the award's budget is being spent in foreign countries?

None.

V. Changes/Problems

Violation of protocol

None to report

Actual or anticipated problems or delays and actions or plans to resolve them.

As a result of the COVID-19 health crisis, all three of our partnering school districts were shut down on March 16th, 2020 and remain closed currently until early March 2021. Several of our participating triads were near the end of interventions when schools ceased in school instruction. For those, we have initiated posttest data collection, although securing classroom observations is not possible. A small number of our triads were in the middle of interventions. For these, we decided to collect post test data immediately for those in the FSN and control conditions. For those in the hB or hB plus FSN conditions, we offered parents an option to complete the hB intervention by phone, and then initiated post test data collection. If school should return this year, and teachers are interested, we will complete the FSN intervention. In Jessamine County Schools, we had just randomized 13 triads. We will finalize our plan when a determination is made regarding the rest of the school year. If students do not return or

implementation is not feasible, we plan to eliminate these 13 cases from our sample, and hope to provide some services in the fall for participating teachers and families as an expression of our gratitude.

Changes that have a significant impact on expenditures.

None identified.

Significant changes in the use or care of human subjects, vertebrate animals, and/or biohazards.

None to report.

VI. Special Reporting Requirements

Nothing to report.

VII. Budgetary Information

A	B	C	D	E
SF424 Budget Categories	Total grant funds received since beginning of the grant	Total funds drawn down since the beginning of the grant through 2/29/2020	Anticipated commitments from 3/1/2020–12/31/2020	Carryover into the next grant year (B - C - D)
Key Personnel	187,288.00	161,967.85	25,320.15	0
Other Personnel	1,022,040.00	935,847.88	86,192.12	0
Fringe	256,605.00	233,536.50	23,068.50	0
Supplies	241,819.00	213,554.86	28,264.14	0
Consortium	1,283,083.00	1,102,275.64	180,807.36	0
Tuition	3,250.00	3,250.00	0	0
Travel	26,792.00	26,181.15	610.85	0
Indirect	476,124.00	433,393.09	42730.91	0
TOTAL	3,497,001.00	3,110,006.97	367,197.79	0

Table 3. Budget Summary