

Understanding the Relation of Provider Characteristics, Implementation Factors and
Participant Risk to Student Outcomes in the Coping Power Program

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CHAPTER I

Statement of the Problem

It is a commonly held view that the translation of evidence-based programs (EBPs) that address youth mental health concerns to community settings involves closely following the prescribed activities and methods of these interventions by qualified service providers to ensure that outcomes observed in research can be obtained in “real-world” settings. To test the validity of this view, researchers have identified and differentiated characteristics of program implementation that might explain variation in effect.

However, there has been limited empirical study of most implementation features, except content fidelity, defined as program adherence to cover essential material and activities as designed (Swanson, Wanzek, Haring, Ciullo, & McCulley, 2013). This focus on adherence to essential activities and coverage of materials neglects how well the processes comprising an intervention were accomplished. The present study broadens the traditional definition of program implementation to include both content and process fidelity and focuses on testing whether variation in these aspects of implementation impact outcomes within community-based implementation of a well-tested, empirically proven group intervention for children and adolescents.

In addition, the potential influence of factors that may impact implementation, such as provider characteristics and characteristics of the participating youth, are considered in this examination. Several characteristics of providers of EBPs have been found to be related to implementation. Provider experience and knowledge, sense of self-efficacy, and engagement have been suggested as potentially important (Driscoll et al., 2003). Additionally, studies suggest that participant risk at the outset of the intervention

can impact both EBP implementation and participant outcomes (Lochman et al., 2015; Schoenwald, Halliday-Boykins, & Henggeler, 2003). However, few studies have examined whether and how these and other potentially influential provider and participant characteristics relate to implementation variables, and in turn how implementation variables relate to participant outcomes. Better understanding the association between implementation variables, provider characteristics, participant risk, and participant outcomes may be particularly valuable in group interventions for youth with behavioral problems or at high risk for such problems, especially given concerns about potential negative effects of interventions with this population (Dishion, McCord, & Poulin, 1999).

In addition to the value of considering each of these different aspects of implementation simultaneously for individual explanatory value, there is growing recognition that these may not be simply competing potential explanations; that there may be a confluence of implementation factors that impact outcomes. There is a need for research that provides empirical support for a conceptual model of EBP implementation that considers the complex interaction patterns between implementation variables (Forman-Hoffman et al., 2017; Hanson, Self-Brown, Rostad, & Jackson, 2016; Novins, Green, Legha, & Aarons, 2013) as well as how patterns of implementation impact participant outcomes (Nadeem, Gleacher, & Beidas, 2013; Perepletchikova & Kazdin, 2005).

This study will add to the existing literature by testing one such multivariate model, where implementation variables mediate the association between provider characteristics and participant outcomes and where participant characteristics moderate

the association between provider characteristics and implementation outcomes (see Figure 1, page 50 for a graphic of the proposed model). Specifically, this study will assess whether content fidelity and process fidelity mediate the association between provider knowledge of evidence-based services and experience with the provision of mental health-related services and reductions in teacher ratings of participants externalizing behaviors from pre- to post-intervention. Additionally, this study will determine whether group participant baseline risk (i.e., average ratings of group participants' pre-intervention externalizing behaviors) moderates the association between provider characteristics and implementation. These questions will be addressed by examining data from the Coping Power Program (CPP; Lochman, Wells, & Lenhart, 2008), an evidence-based program for disruptive behavior among children and adolescents.

Chapter II of this proposal examines each of these areas in greater detail and reviews the existing literature on these topics; intervention implementation factors related to participant outcomes, provider characteristics related to implementation and outcomes, the association between participant risk, implementation characteristics, and participant outcomes, and relevant research examining these topics specifically within the CPP. This review of the literature is integrated with conceptual underpinnings that inform the inquiries of this dissertation. Chapter III describes the study procedure, sample, and measures that will be used to address the hypotheses of this project, as well as the proposed data analytic strategy. Chapter IV summarizes the results of statistical analyses and Chapter V discusses these results along with limitations and implications of the study findings.

CHAPTER II

Literature Review

Theoretical and Conceptual Framework

Over the past several decades, a large number of evidence-based prevention and intervention programs for children and adolescents have been studied and found to be efficacious in the literature (Novins, Green, Legha, & Aarons, 2013). However, the process of understanding the effective implementation of EBPs, translating programs into community settings (e.g., mental health clinics and schools), and efforts to bring these programs to scale has been limited (Hoagwood, Burns, Kiser, Ringeisen, & Schoenwald, 2001; Pas, & Bradshaw, 2012). Additionally, when compared to the strict research protocols of randomized control trials, community-based prevention and intervention efforts tend to be implemented with substantial variation in dosage, specificity of practice, and provider training within community settings (Dusenbury, Brannigan, Falco, et al., 2003; Eiraldi et al. 2019; Pas, & Bradshaw, 2012; Ringwalt, Ennett, Johnson, et al., 2003). Moreover, treatment effects are often attenuated for trials relying on providers within community settings compared to those obtained for the same interventions in efficacy trials (Hoagwood, Burns, & Weisz, 2002; Schoenwald & Hoagwood, 2001). Therefore, there is a need to identify how various implementation factors might explain this difference in impact, to determine whether a given efficacious program can be implemented in community settings, and to what extent the effect found in efficacy tests are retained in moving to such implementation (Bauer, Damschroder, Hagedorn, Smith, & Kilbourne, 2015; SPR MAPS II Task Force, 2008). As the push to utilize EBPs in a variety of community settings, including schools, increases, studying the implementation

process, and which variables (or sets of variables) lead to efficacious implementation and participant outcomes, has become increasingly important. The fields of translational research and implementation science have been developed in response to this need, with the expressed purpose to identify effective models of program dissemination and implementation and determine specific variables of implementation related to desired participant outcomes (Woolf, 2008). Research within the relatively new field of implementation science has identified several aspects of EBP implementation that are most frequently and consistently associated with participant outcomes; these elements of implementation include content fidelity, process fidelity, dosage, program reach, and program adaptation (Durlak & DuPre, 2008).

Content fidelity, which has also been referred to as treatment integrity, adherence, compliance, or faithful replication is defined as the extent to which the necessary components or activities of a program or intervention are delivered and closely followed (Dane & Schneider, 1998). Process fidelity (i.e., delivery quality/group process/therapeutic process) refers to how well intervention content is delivered utilizing a provider's clinical skills. Dosage (i.e., quantity/intervention strength) is how much of an intervention was delivered or received. Program reach (i.e., participation rate/program scope) refers to the rate of participant involvement and representativeness of the participant pool. Finally, program adaptation (i.e., program modification/reinvention) are the changes made to an EBP throughout the implementation process that differentiate it from the original treatment (Durlak & DuPre, 2008).

Reviews of efficacy studies examining prevention and intervention programs for youth (e.g., DuBois, Holloway, Valentine, & Cooper, 2002; Durlak & DuPre, 2008;

Smith, Schneider, Smith, & Ananiadou, 2004; Wilson & Lipsey, 2007) have highlighted several points regarding the status of implementation research as well as these various components of implementation. First, many prevention and intervention studies implemented within community settings do not collect or report on any aspect of the implementation process. This limits the interpretation of studies' findings because outcomes cannot be attributed to the EBP being studied without knowing whether the intervention was delivered as designed and intended (i.e., content fidelity), how well the intervention was delivered (i.e. process fidelity), whether participants received the entire intervention (i.e., dosage), or whether the program underwent significant modification throughout the implementation process (i.e., adaptation). Second, when implementation data is collected, variables are typically studied in isolation, with content fidelity being the most frequently studied element. When implementation (i.e. content fidelity) is measured and linked to outcomes, however, results consistently show that implementation matters for the efficacy and impact of EBPs. However, the associations between lesser studied aspects of implementation (e.g., process fidelity) and outcomes are not clearly understood because of the scarcity of research in this area. While each of the previously mentioned aspects of program implementation has received at least some attention in the literature, the lack of studies that examine several of these implementation features is likely due in part to the difficulty in feasibly monitoring and collecting data pertaining to each of these aspects. For this reason, many studies will focus on only one or two aspects of implementation quality. For example, in the current study, data pertaining to dosage, program reach, and adaptation were not collected, and therefore, cannot be examined. Third, few studies have systematically assessed multiple aspects of

implementation simultaneously. Last, even fewer studies have examined the interactions between factors that impact implementation, such as provider and participant characteristics, and how multiple facets of implementation in turn impact outcomes of EBPs (Durlak & DuPre, 2008). In response to these shortcomings in the literature, researchers have suggested testing multi-component conceptual models to better understand the relative and collective influence of different implementation features (Berkel, Mauricio, Schoenfelder, & Sandler, 2011). Several models have been offered that attempt to capture all or most of the variables that could be relevant to the implementation of EBPs.

Models of implementation. The field of implementation science has produced several implementation frameworks which typically conceptualize the implementation process, “as a complex, multiphasic process that involves multiple stakeholders in service systems, organizations, and practices” (Novins et al., 2013). Several of these models underlie and support the thinking behind the associations between provider and participant characteristics, implementation variables, and participant outcomes as proposed in the current study. The EPIS model (Aarons, Hurlburt, & Horwitz, 2011) structures the implementation process into four steps or phases that include exploration, preparation, implementation, and sustainment and acknowledges the relative influence of two types of contextual factors: internal (e.g., organizational climate and leadership, funding availability) and external (policy, funding, relationships with key stakeholders, supporters, and developers) throughout each of the four steps of the implementation process. In this model, internal contextual factors refer to variables that are present within the specific setting where the intervention is being implemented (e.g., factors within a

particular school system such as school climate, support for program implementation among administration, and resources and funding available for implementation) whereas external contextual factors refer to variables in the environment outside of the specific setting where the intervention is being implemented (e.g., educational policies and guidelines adopted by a state, the relationship between developers of an intervention and the school system). They conceptualize the monitoring of program fidelity and characteristics of individual service providers as being within the internal context of influence during the third step (implementation phase) of the model. While the EPIS model takes into consideration the systemic nature of implementation and considers the implementation process in its entirety (from deciding which intervention to implement to sustaining the intervention over time), it does not explain the pathways by which implementation factors impact participant outcomes. Filling in these missing components of the EPIS conceptual framework, another conceptual implementation research model introduced by Proctor et al. (2009) is particularly useful for understanding the relation between program implementation and participant outcomes. The model explains that the nature of evidence-based mental health interventions and programs dictate several implementation strategies, including both the chosen providers and consumers (participants) of those interventions. The characteristics of the chosen providers and consumers of the intervention can also be understood as internal contextual factors within the third implementation phase of the EPIS model. The model introduced by Proctor et al. (2009) posits that the characteristics of the providers and participants of EBPs influence implementation outcomes, such as the fidelity of the intervention, and that these implementation outcomes in turn influence client outcomes (improved function and

symptomatology). Both the EPIS model and the model presented by Proctor et al. (2009) are utilized simultaneously to frame the inquiry of the current study. In alignment with consideration of the various contextual factors related to implementation outlined in the EPIS model, this study examines variables within the internal context in the third step of the implementation process. Specifically, the study assesses the relations between provider characteristics (experience and knowledge of evidence-based services), participant characteristics (participant risk), and implementation outcomes (process and content fidelity). Furthermore, this study utilizes Proctor et al.'s (2009) implementation model as the basis for the proposed model of relations between these implementation factors and participant outcomes where provider and participant characteristics influence implementation variables which in turn influence participant outcomes (reductions in teachers ratings of participants' externalizing behavior).

Both the literature and conceptual models described acknowledge that EBP implementation is comprised of multiple constructs that interact with each other to impact the efficacy of prevention and intervention programs. Some of these implementation constructs have received minimal empirical study, some have been studied in isolation of other valuable aspects of fidelity, and some are more elaborate than the ways in which they have traditionally been measured and studied. In order to determine how these internal contextual variables may influence each other and interact to produce outcomes, it is necessary to have an empirical understanding of these variables based on the available literature. In the sections that follow, the research examining the influence of internal implementation factors examined in the current study (i.e., content and process fidelity) on participant outcomes as well as the impact of internal provider (i.e.

experience and knowledge of evidence-based services) and participant characteristics (i.e., participant baseline risk) on implementation and outcomes will be summarized.

Implementation Factors and Participant Outcomes

In their review of over 500 research studies included in 5 meta-analyses examining implementation variables that impact EBP outcomes, Durlak & DuPre (2008) concluded that better implementation, overwhelmingly measured by greater content fidelity, was consistently associated with better outcomes and substantially greater effect sizes. They also included 59 additional studies in their review which further supported the positive association between implementation and program outcomes. However, the authors commented that among those additional studies, the majority evaluated either content fidelity or dosage, with only a few studies examining other aspects of implementation (e.g., process fidelity) or more than one aspect of implementation (e.g., content and process fidelity). In discussing the implications of their review, Durlak and DuPre (2008) conclude that further research is needed that identifies additional implementation factors that influence outcomes and how multiple factors interact to produce outcomes. Novins et al. (2013) conducted a similar review of studies from 1991 to 2011 that examined the implementation of EBPS for youth mental health. Among their review of 73 articles, 77% (56 articles) addressed and/or monitored implementation variables within the internal contextual setting, with the majority of these studies measuring content fidelity or provider characteristics. However, only 12 of those studies examined the association between those implementation characteristics and relevant treatment outcomes.

Further, Novins et al. (2013) explained that research examining the process of implementation of EBPs within the school context is especially needed. In their review, Novins et al. (2013) cited only four randomized experimental methods studies that examined the implementation of EBPs for child and adolescent mental health in schools. Additionally, among studies of EBPs conducted in school settings, fewer than 50% of studies measured any variables related to program implementation. Of the studies conducted in the school setting that did measure implementation variables, only content fidelity was reported (Eiraldi et al., 2019; Swanson et al, 2011). Echoing the points made by Durlak and DuPre (2008), Novins et al. (2013) conclude by calling for implementation research that considers the interaction of multiple implementation variables and studying their impact on participant outcomes in EBPS.

Content fidelity. Of the many variables that can be measured and studied in the implementation of EBPs, content fidelity has received the most attention in the literature. In order to determine the effectiveness of EBPs in community settings, it is crucial to ensure that the intervention or program was delivered as prescribed in the research (Kazdin, 2003). For example, if a provider omits critical elements of an EBP, the EBP has not been delivered with content fidelity, and participant outcomes may be impacted. Alternatively, the provider of an intervention may incorporate components of other treatments that are not indicated in the EBP, and, therefore, any observed outcomes cannot be attributed to the EBP. For these reasons, it is important to measure and monitor content fidelity throughout the implementation of EBPs so that outcomes can be attributed to the intervention instead of other confounding factors. Perepletchikova and

Kazdin (2005) explain that, “without ensuring treatment integrity, inferences about the obtained results would be ambiguous” (p. 366).

Of the studies that measure fidelity of implementation, relatively few measures the association between content fidelity and participant outcomes (Dane & Schneider, 1998; Durlak & DuPre, 2008). Of those studies that do, the findings regarding the association between content fidelity and participant outcomes are mixed (Perepletchikova & Kazdin, 2005). Many studies have found that high levels of content fidelity are associated with improved participant outcomes (Battistich, Schaps, Watson, Solomon, & Lewis, 2000; Battistich, Schaps, & Wilson, 2004; Conduct Problems Prevention Research Group, 1999; Forgatch et al., 2005; Greenwood, Tapia, Abbott, & Walton, 2003; Henggeler, Melton, Brondino, Scherer, & Hanley, 1997; Hulleman & Cordray, 2009; Kam, Greenberg, & Walls, 2003; Lapan, Gysbers, & Petroski, 2001; Solomon, Battistich, Watson, Schaps, & Lewis, 2000; Wilson & Lipsey, 2007). In a recent review of studies where content fidelity was measured, it had a significant positive association with target intervention outcomes in 35 of 37 studies (Durlak & DuPre, 2008). In a meta-analysis of 249 studies of interventions for aggression and disruptive behavior delivered in school settings, Wilson and Lipsey (2007) concluded that better content fidelity was significantly associated with larger effect sizes for reductions in aggression and disruptive behavior among selected/targeted interventions. Importantly, they note that researchers were heavily involved in many of the studies included in the meta-analysis and that interventions implemented in typical school settings without research support are likely to have lower implementation quality. However, other studies have found little or no association between content fidelity and participant outcomes (Bein et al., 2000;

Burke, 1996; Cho, Hallfors, & Sanchez, 2005; Elias, et al., 1986; Patton, 1998; Pentz, Trebow, Hansen, MacKinnon, et al., 1990; Resnicow et al. 1998; Spoth, & Redmond, 2002; Toffalo, 2000). As an example, across randomized control studies of a universal family-focused prevention program targeting reductions in youth aggression and substance use, Spoth and Redmond (2002) found that when schools with high vs. low levels of implementation were analyzed separately, there were minimal or no differences between student outcomes among those groups.

To explain findings indicating that content fidelity had little or no association with participant outcomes, authors have cited issues with indirect measures of content fidelity, including raters or reporters of content fidelity. When providers of interventions are asked to monitor and report their own content fidelity, their ratings may be inflated due to self-report bias (Perepletchikova, & Kazdin, 2005). Additionally, providers asked to retrospectively report their content fidelity may not accurately remember various components of sessions and material that they covered. In one study, independent coders' ratings of fidelity were related to participant outcomes while providers' ratings were not associated with participant outcomes, indicating that providers may be biased and tend to overestimate content fidelity (Goldberg Lillehoj, Griffin, & Spoth, 2004). For these reasons, independent coding of content fidelity (either live or via video recording) is generally a preferred method over provider's or participants' report (Swanson et al., 2013). In other cases, authors have argued that weak associations between content fidelity and treatment outcomes can be attributed to low variability in fidelity, resulting in weaker power to detect a relation between fidelity and treatment outcomes. (Durlak & DuPre, 2008). For instance, if all providers in a study implement an EBP with high fidelity, then

the likelihood of finding differences in participant outcomes based on differences in content fidelity is reduced. Additionally, other implementation factors (e.g., process fidelity, dosage) or factors related to the provider (e.g., knowledge or experience) or participants (risk status) are often not measured in studies, and it is also possible that these factors may account for the lack of association between content fidelity and outcomes.

Overall, the body of research linking content fidelity to participant outcomes is mixed. In reporting content fidelity, independent coding and measurement of the construct is preferred. The research suggests that content fidelity is likely important but may not be the only implementation factor that contributes to participant outcomes. Content fidelity is only one aspect of implementation and may serve as a proxy for other variables/factors that contribute to relevant intervention outcomes.

Process fidelity. While the construct of content fidelity captures whether and how much of the necessary components of an EBP are provided (the “what” of an intervention), process fidelity refers to how the necessary components of an intervention are delivered and includes how organized, coherent, and engaging the provider is in their delivery of the material (the “how” of an intervention; Dusenbury et al, 2003). For example, within the CPP, a core component of the program is teaching participants a social problem-solving model. In this case, a provider would receive a high content fidelity score if they explained to participants how to complete each step in this model. In order to receive a high process fidelity score, however, they would need to explain the steps of the model in order and how the steps build upon material learned in previous sessions, ask students for their own relevant examples of when and how they might use

the problem-solving model, and provide positive reinforcement when students participated in role plays practicing the model. When compared with content fidelity, process fidelity reflects the extent to which key engagement and therapeutic processes are evident during implementation, such as engagement of clients, providing information that is relevant to clients, and level of participant activity during sessions. In this way it can seem to vary more depending on the providers' clinical skills (Berkel, Mauricio, Schoenfelder, & Sandler, 2011). While content and process fidelity may be related and are thought to influence each other, it is also possible that a given provider can be high on one and low on the other (Miller & Binder, 2002). Understanding the relation of these two elements of implementation and how they may differentially impact intervention outcomes is one interest of this study.

A relatively small number of studies have systematically examined the impact of process fidelity on outcomes (Fixsen, Naoom, Blasé, Friedman, & Wallace, 2005; Gersten, et al., 2005). In Durlak and DuPre's (2008) review of 59 studies measuring various implementation variables, 6 of 59 studies examined the association between process fidelity and participant outcomes. Of those studies that have linked process fidelity and participant outcomes, positive associations have been observed consistently (August, Bloomquist, Lee, Realmuto, & Hektner, 2006; Botvin, Dusenbury, Baker, James-Ortiz, & Kerner, 1989; Bush et al., 1989; Taggart, Bush, Zuckerman, & Theiss, 1990; The Conduct Problems Prevention Research Group, 1999; Weisman, et al., 2003). For example, The Conduct Problems Prevention Research Group (1999) found that process fidelity was associated with reductions in conduct problems. Importantly, there are no known studies where process fidelity is not positively associated with desired

intervention outcomes. This stands in contrast to the mixed findings regarding the association between content fidelity and intervention outcomes and provides support for additional research on the impact of process fidelity. This may be due to the few studies undertaken to date or it may represent an important, but often under-considered, influence on impact.

An issue with regard to the measurement of process fidelity is identifying and measuring processes consistently across studies. It may seem that each EBP requires different clinical skills and techniques for disseminating information and the particular constructs may vary by theory of process effects. Thus, to date specific process fidelity measures have been developed for different EBPs. In this study, for example, the construct of process fidelity is based on a subscale of a measure created by the developers of the CPP specifically for the intervention. This measurement presents challenges, because there are not agreed upon constructs of process fidelity, available measures of those constructs, or adequate psychometric data for most measures.

Provider Characteristics, Implementation, and Participant Outcomes

Associations between provider characteristics and participant outcomes.

Mental health experience. An important issue in the implementation of EBPs is that there is a lack of mental health providers who are adequately trained and equipped to provide interventions with command of the conceptual and practical components (Lyon, Stirman, Kearns, & Bruns, 2011). In response to this problem, there has been an emphasis on preparing, recruiting, and retaining qualified professionals to provide EBPs (e.g., encouraging universities and training programs to train students in the latest EBPs, finding ways to increase motivation to implement EBPs among experienced providers).

There has also been a push to provide training and support to individuals without the necessary mental health training or background to implement EBPs with efficacy (e.g., providing training to school-based staff and bachelor's level providers; Marsenich, 2011). Arising as part of this interest in what is required to be able to implement EBPs well is attention to whether the background and experience of the providers of EBPs impacts the effectiveness of interventions so that training and policy initiatives can support the scaling of EBPs in community settings. In a majority of studies where information about the experience of providers was collected, the roles (e.g., mental health professionals with advanced degrees vs. providers with bachelor's degrees or no background in mental health) and amount of experience of providers have been shown to be related to increased effectiveness (Asgary-Eden, & Lee, 2011; Blatt, Sanislow, Zuroff, & Pilkonis, 1996; Beutler, 1997; Driscoll et al., 2003; García-Poole, Byrne, & Rodrigo, 2019; Henggeler, Melton, Brondino, Scherer, & Hanley, 1997; Huppert et al., 2001; Perepletchikova & Kazdin, 2005; Schoenwald, Chapman, & Kelleher, 2008; Stein & Lambert, 1995). Several studies, however, have failed to find a significant association between provider role or experience and participant outcomes (Christensen & Jacobson, 1994; Multisite Violence Prevention Project, 2012; Schoenwald, Letourneau, & Halliday-Boykins, 2005). In some cases, research suggesting a lack of association between experience and participant outcomes has been explained by vague or inconsistent definitions of provider experience (Driscoll et al, 2003). For example, many research studies utilize graduate students and trainees as intervention providers, but research has not always accounted for the nuanced differences between the types or amount of experience among students and how these differences in training may influence outcomes (Stein & Lambert, 1995). In

other instances, the lack of association between provider experience and participant outcomes has been explained by arguing that when an intervention is highly structured or there is sufficient training and supervision of providers during implementation, the influence of provider experience may diminish (Multisite Violence Prevention Project, 2012). Other research indicates that provider experience is negatively associated with participant outcomes (LeTendre et al., 2003) and offer the explanation that providers with increased experience may be less inclined to closely adhere to program activities, resulting in poor content fidelity and worse student outcomes. The available evidence does not clearly indicate whether there is a positive association between the role and amount of experience of providers and EBP effectiveness, warranting additional studies that examine the associations between these two variables.

Knowledge of evidence-based services. In addition to their roles and amount of experience, providers may vary in terms of their knowledge of the principles and concepts that underlie evidence based practices for a variety of presenting problems as well as the specific EBP they are being asked to implement. Depending on a provider's specific training and professional experiences, there may be a discrepancy between their experience and their knowledge of evidence-based services. For example, if a provider received their training before relatively new EBPs were developed and tested for their efficacy, they may have little knowledge of these interventions and their proposed mechanisms of change. For this reason, it is important to examine whether amount of experience versus knowledge of evidence-based services of providers of EBPs has a differential impact on EBP outcomes (Okamura, Nakamura, Mueller, Hayashi, Higa McMillan, 2016). When providers' knowledge of evidence-based services has been

directly assessed, positive associations between knowledge of EBPs and participant outcomes have been observed in several studies (Henderson, MacKay, & Peterson-Badali, 2006; Henderson, Mackay, & Peterson-Badali, 2010).

Associations between provider characteristics and implementation. In addition to the impact of providers' training/experience and knowledge of evidence-based services on participant outcomes, research has demonstrated the relation between provider characteristics and their effective implementation of EBPs. In fact, some have suggested that lack of provider experience and knowledge is one of the most significant factors negatively impacting the dissemination and implementation of EBPs. In a review of factors impacting the fidelity of EBPs, Perepletchikova and Kazdin, (2005) explain that providers' amount of experience and motivation to work with clients has been shown to positively impact content fidelity (Gresham, 1989; Miller & Binder, 2002; Weissman, Rounsaville, & Chevron, 1982). Building on this evidence, in their review of the implementation of EBPs for youth, Novins et al. (2013) cite several descriptive studies that have demonstrated an association between increased provider experience and improved implementation (Aarons, Hurlburt, & Horwitz, 2011; Asgary-Eden & Lee, 2011; Schoenwald, Chapman, & Kelleher, 2008). However, in other studies, providers' training and experience did not predict improved EBP implementation (Schoenwald et al.; Warner et al., 2016), while other studies indicated that providers with greater experience implemented interventions with less fidelity than clinicians with less experience (Perepletchikova & Kazdin, 2005). The authors speculate that this may occur because more experienced providers may be less receptive to learning and utilizing new techniques in their work with clients or may tend to incorporate components of other

treatments into EBPs, thereby decreasing adherence. In terms of implementer knowledge of EBPs, there is some indication that increased knowledge contributes to improved implementation (Henderson, MacKay, & Peterson-Badali, 2006).

The literature regarding the influence of provider characteristics in the implementation of EBPs is also mixed, with some studies suggesting that greater experience with and knowledge of both broad evidence-based practice and specific EBPs among providers results in better implementation and others suggesting no effect or negative associations between knowledge and experience and content fidelity. Of importance, the majority of studies on these topics have failed to examine how provider characteristics relate to implementation variables other than content fidelity (e.g., process fidelity). In addition, there is a lack of research addressing the more complex interaction of provider characteristics, implementation, and participant outcomes.

Relations Between Participant Risk, Implementation, and Outcomes

Participant risk and implementation. Children and adolescents with mental health problems enter treatment with varying levels of clinical severity and impairment and a variety of comorbid diagnoses. High-risk youth (i.e. children and adolescents with a greater number of symptoms and more severe presentation) pose unique challenges to providers of EBPs. Perepletchikova and Kazdin, (2005) explain that when providers perceive that clients are difficult or complex cases, they may believe that they cannot adequately address the client's needs or that the client requires a higher level of care. As a result, the provider may deviate from the protocol of an intervention by not completing necessary components of an EBP or by incorporating other practices not indicated in the EBP in an attempt to address more severe symptoms.

Another consideration for how participant risk may relate to model adherence are findings that indicate placing high-risk youth with disruptive behavior problems into groups may produce negative effects (Dishion, McCord, & Poulin, 1999). For example, in a randomized control trial of seventh grade students participating in the Adolescent Transitions Program versus students in a control condition, Dishion et al., (1999) found that peer treatment groups contributed to higher rates of tobacco use and teacher-rated delinquent behaviors, and that these effects were most pronounced among high-risk youth. The process through which these negative treatment effects occurred was deemed peer “deviancy training” by Dishion et al. (1999), where antisocial peers reinforced antisocial attitudes and behaviors within the group treatment setting. In a three-year follow-up, students who participated in the group treatment were still more likely than students in the control condition to use tobacco and engage in delinquent behavior (Poulin et al., 2001). Additional research indicates that placing high-risk, aggressive youth into group interventions may have iatrogenic effects, and that researchers and clinicians should use caution when doing so (Dishion & Tipsord, 2011; Dodge, Dishion, & Lansford, 2006; Dodge et al, 2006). The argument made was that while trying to implement the intervention the group members may be circumventing treatment intent and coaching toward and reinforcing disruptive behavior of each other. However, confounding this conclusion is that providers are less likely to implement an EBP with fidelity when working with high-risk individuals including participants with anger and hostility, and/or significant problem severity and duration (e.g., Detrich, 1999; Elliott, 1986; Foley, O’Malley, Rounsaville, Prusoff, & Weissman, 1987; Waltz et al., 1993). For example, in a study of the implementation of multi-systemic therapy within community

settings, “the severity of antisocial behavior was inversely related to therapist adherence” (Schoenwald, et al., 2003). In a later study, Schoenwald, et al. (2005) found that providers’ adherence was higher when working with participants who had healthier pre-treatment ratings of psychosocial functioning. In another randomized trial examining the implementation of multi-systemic family therapy, Huey, Henggeler, Brondino, and Pickrel (2000) demonstrated poorer program adherence among providers working with youth with worse functioning. The convergence of these two lines of study suggest that it is uncertain how participant risk may moderate the impact of fidelity; it seems valuable to see how variation in fidelity varies by participant risk when multiple implementation features are measured.

Association between participant risk and outcomes. Several factors can be conceptualized as contributing to at-risk or high-risk status among youth. In the literature, aspects of risk have included diagnostic comorbidity, severity and duration of illness, and impairment of the disorder and its associated impact on functioning. In their review of EBP implementation for youth, Perepletchikova and Kazdin, (2005) cite that factors related to participant risk (severity and duration of the disorder) tend to be the one of the stronger predictors of participant outcomes in psychological interventions (Brent et al., 1998; Hamilton & Dobson, 2002; Mynors-Wallis & Gath, 1997; Petry, Tennen, & Affleck, 2000; Scheibe & Albus, 1997).

With regard to illness severity, in a review of patient predictors of outcomes in treatment for depression, client’s pre-treatment severity was consistently associated with poorer response to treatment (Hamilton & Dobson, 2002). In a randomized control trial studying a preventive intervention for parentally bereaved youths, participants with lower

levels of mental health problems prior to the intervention had a lower likelihood of being diagnosed with a mental health problem following the intervention than those participants with greater mental health problems at baseline (Sandler, Ayers, & Tein, 2010). Fossum, Larsson, and Morch (2010) examined data from a sample of children who had received the Incredible Years intervention and found that children with higher pre-treatment maternal ratings of aggressive behavior continued to have persistent conduct problems at one-year follow-up. In a study of factors that predicted positive treatment outcomes among antisocial children, Kazdin (1995) found that children with lower parent ratings of severity and impairment at pre-treatment had greater gains (lower parent ratings of deviance and prosocial functioning) at post-treatment than those children with higher ratings at pre-treatment.

In contrast to the findings linking greater participant risk to poorer treatment outcomes, several studies have demonstrated that participants with higher risk actually benefit more from psychological interventions than participants with lower risk (Kellam, Rebok, Ialongo & Mayer, 1994; Tolan, Gorman-Smith, Henry, & Schoeny, 2009). For instance, in a meta-analysis of studies examining interventions targeting aggressive and disruptive behavior in schools, Wilson and Lipsey (2007) found that the interventions examined collectively resulted in significant decreases in target program outcomes, particularly among students with higher baseline levels of aggression and disruptive behavior.

Given the conflicting findings regarding the association between participant risk and treatment outcomes, it is important to consider how risk might moderate implementation variables that ultimately impact participant outcomes.

Studies Assessing the Impact of Implementation, Provider, and Participant Factors within the CPP

The present study utilizes data collected during implementation of the Coping Power Program (CPP), a multi-component, school-based, manualized group CBT prevention and intervention program that was developed by John Lochman and Karen Wells to address aggression and disruptive behavior problems in children during late childhood (Lochman, Wells, & Lenhart, 2008). The original version of Coping Power, which consists of 34 child sessions and 16 parent sessions and was delivered to groups of 3-8 upper elementary-aged participants, has been adapted for use within a variety of settings and populations (Lochman et al., 2009). The CPP is based on a contextual social-cognitive model of understanding the development of behavior problems in addition to the core principles of cognitive behavioral therapy treatment. Important components of the CPP include behavioral goal setting, teaching emotional awareness, improving anger management, perspective taking, and social problem-solving skills.

Several efficacy and effectiveness studies have provided evidence for the CPP's positive impact on a variety of outcomes including reduced teacher and parent ratings of children's aggression and externalizing problems, delinquent behavior, parent-rated substance abuse, self-ratings of the positive expectations associated with aggressive behavior, and improved teacher-ratings of positive social and academic behaviour (Lochman & Wells, 2004; Lochman et al, 2009; Lochman & Wells, 2002; Lochman, Wells, & Qu, 2013).

As a small group intervention for youth with or at-risk for disruptive behavior problems, CPP poses both potential benefits and disadvantages. One significant benefit of

group treatment is that it can reach a greater number of participants efficiently within community settings (McLean et al, 2001). In addition, there are opportunities for benefits within group settings that do not occur in individual interventions. For example, Poulin, Dishion, and Burraston (2001) found that group reward systems and peer reinforcement play an important role in helping children to attain intervention-related goals and thus to generalize behavior improvements from the intervention to real-world home or school settings. Additionally, they argue that the group format affords children the opportunity to practice newly learned skills among their peers.

However, as previously noted, research examining group interventions for antisocial, aggressive, or disruptive youth indicates that these interventions may have an unintended negative impact on targeted participant outcomes (Dishion et al., 1999). However, negative effects are not always found in groups with high-risk youth, and the deviancy training process has not been documented empirically as the basis for observed negative effects. Furthermore, the negative effects of group interventions that have been observed in other studies have not been documented in the CPP.

In terms of provider characteristics, potential peer deviancy training that may occur and contribute to poor program implementation and negative participant outcomes may be diminished when CPP groups are implemented by providers with certain characteristics. A study examining the effects of provider factors on the implementation of the CPP found that providers' conscientiousness was positively associated with engagement with participants in the intervention. Additionally, providers' agreeableness was positively associated with better implementation (Lochman et al., 2009). In a more recent study reviewing 938 CPP sessions that were coded to determine the impact of

various participant and provider factors on outcomes, Lochman et al. (2017) found that CPP providers' use of clinical skill (as measured by the provider's ability to manage their own frustration; be warm, positive, and professional; and not be overly rigid in their presentation) during sessions predicted lower teacher ratings of participants' externalizing behavior problems at follow-up. Taken together, these two studies provide evidence for the potential impact of provider characteristics and clinical skills on students' experience within, and response to, the CPP. While these studies examined the impact of provider characteristics on participant engagement and effective implementation, they did not consider the impact of aspects such as providers' prior experience or knowledge of evidence-based services.

Positive impact of the CPP may also be maximized when participants are selected for the intervention based on their unique characteristics and baseline functioning. For example, Jurecska, Hamilton, and Peterson (2011) implemented the CPP with a group of 63 adolescents in middle schools and found that the participants with the greatest reductions in ratings of problematic behaviors were students with comorbid ADHD and disruptive behavior difficulties. In terms of symptom severity, Lochman et al. (2017) found that high levels of participant disruptive behavior during CPP group sessions contributed to higher parent and teacher ratings of externalizing behavior problems at follow-up. These findings suggest that characteristics of participant risk can influence outcomes among participants specifically within the CPP. However, more research is needed to determine whether specific participant risk factors directly influence CPP participant outcomes or whether these risk factors may indirectly result in negative outcomes among CPP participants by impacting poor program implementation.

Group interventions that are delivered with high levels of content and process fidelity may also minimize negative effects and promote positive outcomes. Several studies of the CPP have documented the association between high content and process fidelity and desired participant outcomes (Lochman et al., 2009; Muratori et al., 2017). Lochman et al. (2009) observed that providers who received enhanced training implemented the CPP with better process fidelity (greater provider engagement), and that this improved process fidelity was associated with greater reductions in ratings of participants' externalizing behavior.

The primary goal of the study (Project ACCESS; Advancing Collaboration for Students' Emotional and School Success) from which data for the present study were drawn was to assess the amount of support school-based providers required to effectively implement the CPP within a larger PBIS framework. Therefore, analysis of the study data has focused on examining the effect of providers' assigned support level on program implementation and student outcomes. Studies reporting outcomes of Project ACCESS have not yet been published. However, unpublished results examining the data indicate that overall, CPP participants experienced significant decreases in diagnostic status from pre- to post-intervention. Results also indicate that providers assigned to a condition that received additional implementation support implemented the CPP with greater content fidelity than providers without the enhanced implementation support, although these differences were not statistically significant. There was no difference in levels of process fidelity between providers assigned to different support conditions (Eiraldi, 2019). Published findings from the preliminary, pilot phase of the study have shown that among 38 students enrolled in the CPP, participants with intermediate diagnostic status (i.e.,

students who were considered “at-risk”, but did not meet full diagnostic criteria for mental health disorders based on the structured diagnostic assessments provided at baseline) had significant changes in their diagnostic status (e.g., from intermediate diagnoses to no diagnosis) from pre- to post-intervention (Eiraldi et al., 2019). Based on the same pilot phase data, Eiraldi et al. (2016) found that significant changes in diagnostic status of externalizing behavior disorders from pre- to post-intervention were associated with high levels of content fidelity (88% on average). To date, project data has not been leveraged to determine the impact of the CPP intervention on participant outcomes other than diagnostic status. In addition, data collected throughout the entire implementation phase of Project ACCESS has not been utilized to answer questions about the relative impact of provider characteristics on implementation quality, or of participant risk on program implementation.

The Present Study

In addition to lending further support for the previously documented associations between specific provider, participant, and implementation factors to participant outcomes, this study will expand upon the findings of studies of implementation of the CPP by proposing and testing a conceptual model of implementation that considers the associations between these factors simultaneously. The present study seeks to accomplish these aims by examining whether and how variation in provider, participant, and implementation factors relate to positive outcomes for CPP participants.

The present study has two primary goals. First, the study intends to provide additional evidence for associations between provider and participant characteristics, implementation variables, and participant outcomes observed in prior EBP

implementation research (e.g., better content and process fidelity scores contribute to improved participant outcomes, greater provider experience and knowledge of evidence-based services produce better content and process fidelity and participant outcomes, and that participants with greater risk contribute to lower content and process fidelity). The second goal of this study is to propose and evaluate an innovative, complex conceptual model of EBP implementation that is informed by existing models of EBP implementation and incorporates prior associations between variables documented in implementation research.

To accomplish these goals, this study will leverage data from *Project ACCESS*. Data pertaining to the implementation of the CPP in six public schools were collected over a five-year period from 2013-2018. The associations between provider characteristics, participant risk, implementation variables, and participant outcomes will be assessed.

Study Hypotheses

Hypothesis 1: Consistent with literature suggesting that greater provider experience and knowledge of evidence-based services contribute to better implementation and participant outcomes, it is predicted that implementation variables (content and process fidelity) will mediate the associations between provider characteristics and participant outcomes such that greater provider experience and knowledge of evidence-based services will influence improved implementation (greater content and process fidelity), which will in turn influence positive participant outcomes (reductions in teacher ratings of participants' Externalizing TRF index scores).

Hypothesis 2: There is a prevailing suggestion among the literature regarding participant risk that higher participant risk is negatively associated with implementation. Therefore, it is hypothesized that cohort risk will moderate the relation between provider characteristics and implementation variables (content and process fidelity) such that among high-risk groups, providers with less knowledge and experience will have poorer implementation than providers with greater knowledge and experience.

CHAPTER III

Methods

The Larger Study (Project ACCESS)

As previously indicated, data for this dissertation are drawn from Project ACCESS, a five-year cluster randomized trial (CRT). The primary goal of the project was to examine the impact of two different levels of support on the implementation of a School-Wide Positive Behavior Interventions and Supports (PBIS) program with evidence-based, small group cognitive-behavioral therapy (CBT) programs (Coping Power Program and FRIENDS for Life Program) at the Tier II level. The study was conducted in 6 low-income, urban elementary and middle public schools in a large school district in the Northeast. Prior to the first year of the study, three of the participating schools in the project were randomly assigned to the basic consultation condition while three schools were assigned to the enhanced consultation condition. In order to assist schools with implementing the program after the project's completion, the study consisted of two phases: the implementation phase and the sustainability phase. During the implementation phase, schools in their respective conditions received differentiated levels of support (described in greater detail below) from the research team. However, during the sustainability phase of the project, all schools received the same level of support to increase schools' capacity to implement the programs independently.

This study focuses specifically on examining student, provider, and implementation data related to the Coping Power Program (CPP) provided at the Tier II level throughout both the implementation and sustainability phases of the study. The CPP intervention was chosen primarily because it is designed to address youth with or at-risk

for aggressive and disruptive behavior, and it has strong efficacy evidence, making it an apt intervention for examining whether differences in student, provider, and implementation factors in groups for children with externalizing behavior concerns have an impact on student outcomes.

Whenever possible, CPP sessions were video recorded live. However, due to scheduling conflicts or technical errors, some CPP sessions were not recorded. All recorded CPP session videos were coded for content fidelity, or how well the implementer adhered to the activities outlined in the protocol for that particular session, as well as process fidelity, or how well the implementer presented the material and engaged participants in the sessions. Student-level variables were measured using pre- and post-intervention parent and teacher-reported measures of participants' demographic information and externalizing behavior. Data pertaining to the providers of the Tier II interventions was collected prior to the first intervention session in the first year of the project that the provider implemented a CPP group. Thus, the study design permits examination of student, provider, and implementation factors' effects on student outcomes and to consider these effects across schools and study conditions.

Project procedures. All students in each of the 6 participating schools received universal Tier I positive behavior support intervention, while students presenting with emotional or behavioral needs could be referred for Tier II interventions. At the Tier II level, students with or at-risk for externalizing behavior problems were referred to the Coping Power Program (CPP). School-based Tier II group providers either volunteered or were assigned by their school administrator to lead the CPP groups. All six schools' designated CPP providers received the same initial training from licensed doctoral-level

experts in clinical and school psychology in cognitive-behavioral therapy (CBT) as well as in-depth training pertaining to the CPP intervention. Following this training, providers across schools worked with study consultants to recruit students for the CPP groups. This process involved distributing, collecting, and scoring screening measures from teachers and other school staff and then calling parents of students who met screening criteria to obtain permission to release their information to the research study team.

During the first year of the study (2013-2014), school staff received initial study training in the fall of 2013 and then began recruitment for the first cohort of CPP groups after completing training. Each of the six schools ran one cohort of CPP groups in the spring of 2014. In years 2 (2014-2015), 3 (2015-2016), 4 (2016-2017) and 5 (2017-2018) of the study, group providers were encouraged to recruit students during both the fall and the spring, so that each school could facilitate two cohorts of CPP groups per school year. Due to several factors including turnover of group providers, staff willingness to complete screening measures, difficulty scheduling eligibility evaluations with parents, and lack of eligible students, some schools were not able to run two cohorts of CPP groups in years 2 through 5 of the study. Additionally, due to scheduling conflicts, some CPP cohorts were not able to run one session per week for 14 weeks. This resulted in some cohorts where the content from two sessions were combined into one group session so that groups would coincide with the beginning or ending of academic semesters. Altogether, there were a total of 44 distinct CPP cohorts implemented within the six participating schools over the five-year study.

Eligibility and Exclusion Criteria. Students in third through eighth grade at each of the six participating schools were initially referred for potential participation in the

CPP by a school staff member or parent who completed the Strengths and Difficulties Questionnaire (SDQ) screening measure (SDQ; Goodman, Ford, Simmons, Gatward, & Meltzer, 2000). Students who received an at-risk or clinically significant score on either the Emotional Symptoms or Conduct Problems scale of the SDQ were eligible to participate in an eligibility evaluation. Parent permission was then obtained from school staff for a study team member to contact the parent to schedule the evaluation. Eligibility evaluations were conducted either in-person or via phone. Each evaluation began with the study team member obtaining parent consent to conduct the evaluation. Parents then completed the NIMH Diagnostic Interview Schedule for Children, Computer Version, 4th Edition (C-DISC-IV) (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000) as part of the initial eligibility evaluation to be enrolled in the study. In order to be eligible for enrollment in the CPP group, students had to have either a positive or intermediate diagnosis of conduct disorder or oppositional defiant disorder at pre-intervention according to the C-DISC-IV. After conducting the eligibility evaluation, independent evaluators determined the student's primary study diagnosis. Students enrolled in the CPP had to have a primary study diagnosis of either Conduct Disorder or Oppositional Defiant Disorder.

Students enrolled in kindergarten through second grade, those with an Autism Spectrum Disorder diagnosis prior to being referred for participation, and those without parental consent or student assent were excluded from consideration for the study. Some students who met eligibility criteria for the study required a higher level of intervention as determined on a case-by-case basis by the research team, and thus were excluded from participation in the study.

Basic Consultation versus Enhanced Consultation. Following initial training, CPP group providers assigned to the basic consultation condition received ongoing support from consultants who were research team members in the form of weekly meetings. During these 15-20 minute weekly meetings, consultants worked with the provider to prepare them for the upcoming session by reviewing the core components of each lesson, the list of required materials, exemplar videos of other providers implementing activities, discussing possible barriers to implementation ahead of the group session, and answering any questions group providers may have. Providers assigned to both support conditions had their CPP sessions video recorded and coded for content and process fidelity. However, providers in the basic support condition did not receive feedback from consultants regarding their content or process fidelity following their group sessions. In addition to participating in weekly consultation meetings with consultants prior to each session, providers in the enhanced consultation condition also participated in additional coaching meetings. During these 20-30-minute coaching meetings, CPP group providers received positive and constructive feedback from consultants regarding both their content and process fidelity during the previous session and suggestions for how they could improve the implementation of the program. Feedback regarding content fidelity and process fidelity was provided by reviewing the content fidelity and process fidelity checklists with the provider at the coaching meeting. During the sustainability phase of the project (the last two years of the project: 2016-17 and 2017-18) enhanced consultation was eliminated from the project so that providers in both the basic consultation and enhanced consultation schools only received basic

consultation support from the study team. For the purposes of this study, implementation support condition will be treated as a control variable.

The Coping Power Program intervention. The original CPP was modified for use in Project ACCESS; the number of student sessions was shortened to 14 weekly sessions, the time allotted for each session was shortened to fit within a 30-45-minute class period, parent sessions were eliminated from the treatment, and specific wording and activities within the manual were changed to accommodate the low-income, urban context in which the study took place. Each group session occurred at the child's school during students' lunch or special period, or at another time that did not interfere with academic subjects. Although designed to fit within a 30-45-minute class period, individual sessions ranged in length from approximately 25 minutes to one hour. Data from CPP groups in both the basic consultation and enhanced consultation support condition schools over the course of the project were analyzed.

Video coding procedure. Each CPP session video was rated for both content and process fidelity by an independent coder. Independent coders met training criteria (minimum Kappa agreement of .8 between coders on content and process fidelity on five sample group sessions). Coders who failed to meet this criterion received additional training before beginning video coding. Thirty percent of the session videos within each year of the five-year project were double coded to assess inter-rater reliability. Inter-rater reliability for coding of process and content fidelity across all five years of the project was acceptable; process fidelity (ICC = .70) and content fidelity (K = .84).

Sample

Student sample. Over the five years of the project, there were 186 student participants who were enrolled in one of 44 separate CPP cohorts. The data from these student participants across Coping Power cohorts/groups comprised the sample that will be used in the analyses for this study. The sample was 73.1% male; 59.1% Hispanic; 40.3% of caregivers identified student participants as White and 59.7% as non-White (including African American and mixed-race students). Students who participated in CPP groups were enrolled in third through eighth grade, with the majority of CPP participants (85.5%) enrolled in third through fifth grade. The sample was primarily composed of students from low-income households with 69.7% of the sample's primary household income reported as less than \$20,000 per year. The sample was relatively evenly split with regard to support condition; 47.3% of the sample was enrolled in CPP groups assigned to the basic consultation support condition and 52.7% in the enhanced consultation condition. The percentage of participants that attended each school (1-6) were 17.2% (School 1), 15.6% (School 2), 27.4% (School 3), 14.5% (School 4), 10.2% (School 5), and 15.1% (School 6).

Provider sample. The providers ($n = 18$) of the CPP groups were school-based staff members who conducted at least one CPP group over the course of the five-year study. CPP providers' roles within the school varied and included school counselors, administrators, special education teachers, and regular education teachers. Some providers led only one CPP cohort, while others conducted multiple CPP groups/cohorts (range: 1-9) over the length of the study. Information regarding providers who facilitated multiple cohorts of CPP is provided in Figure 1. For providers who implemented multiple cohorts, providers' process fidelity and content fidelity scores for each cohort and the

range of their scores are presented in Table 1. The providers in this sample were 83% female, 61% White, and 38% Black/African American or multi-racial. Providers assigned to the basic consultation condition made up 55% of the sample while those assigned to the enhanced consultation condition made up 44% of the sample. A complete list of demographic variables for student and provider samples is reported in Tables 2 and 3.

Measures

Participant outcomes.

The Child Behavior Checklist and Teacher Report Form. The Child Behavior Checklist (CBCL) (Achenbach & Rescorla, 2001) is a 113-item parent-report measure designed to assess children's (ages 6-18 years) functioning across several psychological domains. For each item, parents select responses on a scale from 0 (not true) to 2 (very often or often true) based on their child's behavior over the past six months. In addition to providing T-scores for a set of eight empirically based syndrome scales and six DSM-5-oriented scales, the CBCL also produces a T-score for the broader Externalizing scale. The CBCL is standardized based on national gender and age norms collected from 1999-2000. The CBCL has good psychometric properties (average inter-rater reliability among parents = .73, average test-retest reliability of .88, internal consistency of .8, validly discriminates between non-clinical and clinical populations) and has been widely utilized as an outcome measure in research (Achenbach & Rescorla, 2001). The Teacher Report Form (TRF) is a parallel measure to that of the CBCL with the informant being the child's primary teacher. The TRF shares 93 items in common with the CBCL, with the remaining items relating to students' school behavior. The TRF generates the same scale

scores as the CBCL (including the Externalizing scale which is the outcome variable in this study), is standardized based on the same norms, and shares the same psychometric properties. Typically, however, agreement between raters on the two measures is low or non-significant (Sourander & Piha, 1997), with parents reporting a greater number of problems than teachers. Teachers and parents have been found to have greater agreement on externalizing rather than internalizing problems (Verhulst & Akkerhuis, 1989). Internal consistency statistics related to the reliability of the CBCL and TRF within the study sample could not be calculated because item-level data was not available for analysis. Preliminary data analysis of this measure included comparisons between parents' CBCL and teachers' TRF reports of students' Externalizing index scores to determine whether these two scores could be collapsed into one outcome measure. Initial analysis of the post-treatment measures indicated that parent and teacher ratings were not significantly correlated $r = .11$, $p = .25$, which is consistent with prior research findings that there tends to be low agreement between parent-reported CBCL scores and teacher-reported TRF scores (Sourander & Piha, 1997). Therefore, parent and teacher ratings could not be feasibly consolidated into one overall post-treatment rating of students' externalizing behaviors. Based on information gathered from missing data analysis as well as theoretical considerations described in subsequent sections, the TRF was chosen as the outcome variable in this study.

Provider Characteristics.

Knowledge of evidence-based services. In order to assess providers' knowledge of evidence-based practices, all CPP providers completed the Knowledge of Evidence-Based Services Questionnaire (KEBSQ) (Stumpf, Higa-McMillan, & Chorpita, 2009)

prior to implementing the CPP for the first time. The KEBSQ consists of 40 True/False-type statements listing therapeutic techniques associated with the treatment of various mental health problems among children and adolescents. Respondents are asked to, “indicate whether the following strategies are included in treatment protocols that have been empirically supported for anxious/avoidant, depressed/withdrawn, disruptive behavior, and hyperactivity/inattention problems.” Respondents circle all mental health areas that they believe the listed practice has been indicated as an evidence-based practice. There is also an option to circle “N” for None, indicating that the listed strategy is not an evidence-based technique for any childhood/adolescent mental health problems. For example, the first item on the KEBSQ reads, “Introducing the child to a stimulus, either directly or through imagined experience, with the aim of decreasing the child’s fear of the object or situation.” The respondent then decides whether this a component of evidence-based treatment for anxious/avoidant youth, depressed/withdrawn youth, youth with disruptive behavior, or youth with attention/hyperactivity difficulties, or none of these. Okamura, Nakamura, Mueller, Hayashi, and Higa-McMillan (2016) explain that:

Each individual item is then scored on a scale from 0 to 4, with correctly endorsed and omitted responses per problem area receiving 1 point each. Total possible scores on the KEBSQ can range from 0 to 160. The multiple true–false format utilized by the KEBSQ has been shown to be as reliable and valid as standard multiple choice-type questionnaires (Kreiter & Frisbie, 1989). The KEBSQ has demonstrated adequate test–retest reliability in a sample of graduate level and community clinicians ($r = 0.56$) and good discriminate validity

between these two populations ($t(181) = -10.16, p < 0.001$) (Stumpf et al., 2009).

Providers' knowledge of evidence-based services score was equal to their total score on the KEBSQ, with higher scores indicating greater knowledge.

Experience. Prior to implementing CPP groups, each school-based provider completed a demographic questionnaire created by the research team. This questionnaire asked providers to indicate their professional role within the school in which they worked as well as the number of years of experience they had providing mental health services or working in a mental health-related field. Providers' experience was measured based on self-report of their years of mental health experience, with higher scores indicating greater years of experience. Responses to this item ranged from 0 to 38 years.

CPP cohort variables.

Implementation variables/mediation variables.

Content fidelity. Content fidelity was coded using the "Coping Power Content Fidelity Checklist" (see Appendix C). This checklist was created by the research team per the adapted 14-session manual that was provided to the group providers and used to implement the CPP groups. These checklists contain activities of each session that are outlined in the agenda for that session within the group manual. For example, the content fidelity checklist for session one of the CPP contains the following items, "Item 1: Establish an agenda, Item 2: Discuss group purpose and structure, Item 3: Introduce and review group rules, etc. The number of items contained on the checklist varies for each session depending on the number of activities and content to be covered in that particular session. Each coder recorded whether the provider included each activity in the session

by indicating either a “Yes” or “No” response. A content fidelity percentage for each session was calculated by dividing the number of items covered in the session by the total number of activities intended to be covered in that session. An overall content fidelity score for each CPP cohort was calculated by averaging the content percentage scores across all group sessions.

Process fidelity. Each CPP session video was coded for process fidelity using a 12-item measure which was adapted from the original 14-item measure created by Lochman and his colleagues (2009) to assess the extent to which the CPP provider adhered to the process fidelity guidelines outlined in the program manual and taught during initial training and ongoing consultation and enhanced consultation meetings (see Appendix C for the complete measure). Each item is scored on a Likert-type scale from 1 (not at all) to 5 (very often). The checklist includes items such as, “The counselor rewarded students for active participation and positive behavior” and “The counselor’s tone was warm and positive.” Two of the items (items 4 and 5) included in the original questionnaire were omitted from the analyses in this project because they pertained to student behavior during the session rather than the behavior of the provider. Items 10 (“Counselor finds opportunities to praise students’ on-task behavior and participation”) and 11 (“Counselor makes teaching moments out of students’ behavioral challenges during group – uses the challenges as examples for session material”) could be scored as N/A (missing) if there were no on-task behaviors to praise or no behavioral challenges during the group for the provider to address. In instances where a coder marked N/A for item 10 and/or 11, the value was coded as “missing” in the dataset. Initially, a process fidelity score for each session was calculated by averaging the scores of the revised 10-

item scale. In instances where values were missing for items 10 or 11, the average process fidelity score for that session was calculated by averaging the remaining values on the scale that were non-missing. An overall process fidelity score for each cohort was calculated by averaging the process fidelity scores of all group sessions. Final process fidelity subscale scores were rendered based on results of a multi-level factor analysis reported in the preliminary analysis of the results section. Based on the results of this analysis (see Tables 4-7), one subscale score within the measure was utilized as the process fidelity variable in this study.

Cohort risk/moderator variable. In this study, several variables related to participant risk were collected at baseline immediately following the eligibility evaluation, including teacher ratings of individual students' externalizing behavior problems on the TRF. Upon completion of the study's eligibility evaluation, teachers were asked to complete the TRF based on their knowledge of the students' behavior over a period of at least two months. Within each CPP cohort, students' individual pre-intervention TRF Externalizing scale scores were averaged across the cohort to which they were assigned to obtain the total cohort risk score.

Covariates. Selected covariates were chosen based on prior studies examining the effectiveness of EBP in school and community settings (Weist, Youngstrom, Stephan, Lever, Fowler, Taylor, et al., 2014). Student participant demographic characteristics included child gender, ethnicity (categorical variables for non-Hispanic vs. Hispanic), race (categorical variables for White versus non-White), grade (3rd-8th) at enrollment (categorical), and annual household income (continuous, in \$10,000 increments). Since a small percentage of the sample (14.6%) were middle school students (enrolled in 6-8th

grades), student grade was consolidated at the middle school level. All nominal student covariates were dummy coded to facilitate interpretation of subsequent analyses. Other participant-level covariates included pre-intervention Externalizing scale scores on the TRF (continuous). Covariates at the CPP cohort level included the support condition that the cohort was assigned (categorical variables for basic consultation and enhanced consultation), and the school where the CPP cohort took place (categorical variables for each of the six participating schools). CPP provider demographic covariates included race (categorical).

Proposed Analytic Approach

Initial analysis included calculating variables (cohort process subscale scores and content fidelity scores, provider KEBSQ scores, and cohort risk scores) and running and analyzing descriptive statistics for all predictors and covariates. Following that, correlations were examined to determine relations between variables within the proposed model. As mentioned above, multi-level exploratory factor analysis of the process fidelity measure was conducted to determine whether there were distinct factors within the process fidelity measure to consider separately in analyses. Next, missing data in the outcome variable was analyzed and addressed. Finally, models examining study hypotheses 1 and 2 were conducted. The data analysis process was undertaken utilizing a model-building framework, beginning with examining the random intercepts model and adding additional predictor and covariate variables at each of the successive levels. Additional statistical models were analyzed as needed to parse out significant relations between variables in the proposed model at various levels of nesting. Details for each of these phases are described below.

Missing data. Of the 186 CPP student participants who completed the CPP over the five years of the study, there were 68 participants for whom parent post-treatment data (parents' ratings of students' externalizing behavior on the CBCL) was not collected and 23 participants for whom teacher post-treatment data (teachers' ratings of students' externalizing behaviors on the TRF) was not collected. Based on this data, as well as conceptual and practical considerations, teachers' ratings (TRF Externalizing scores) were chosen as the outcome variable in this study. Practically, there was fewer missing data among teachers than there was among parents, resulting in available outcome data for a larger portion of the sample to analyze. Additionally, given that the CPP was conducted within the school setting in collaboration with teachers and school-based staff, that the intervention targeted academic behaviors as well as social issues that might occur in the school setting, and that teachers helped to facilitate the generalization of skills learned in the group within students' classrooms, it was inferred that teachers would have better insight into improvements in students' externalizing behaviors within the specific situations and settings targeted by the intervention than parents. Additional analyses of the missing post-treatment teacher data utilizing Little's missing completely at random test (MCAR; Little, 1988) indicated that the teacher post-treatment data was not missing completely at random, $\chi^2(0, N = 163) = .00, p = .00$. Therefore, it was assumed that the data was missing at random (MAR). To account for the missingness of the outcome variable data in subsequent analyses, full information maximum likelihood (FIML) was utilized in final models.

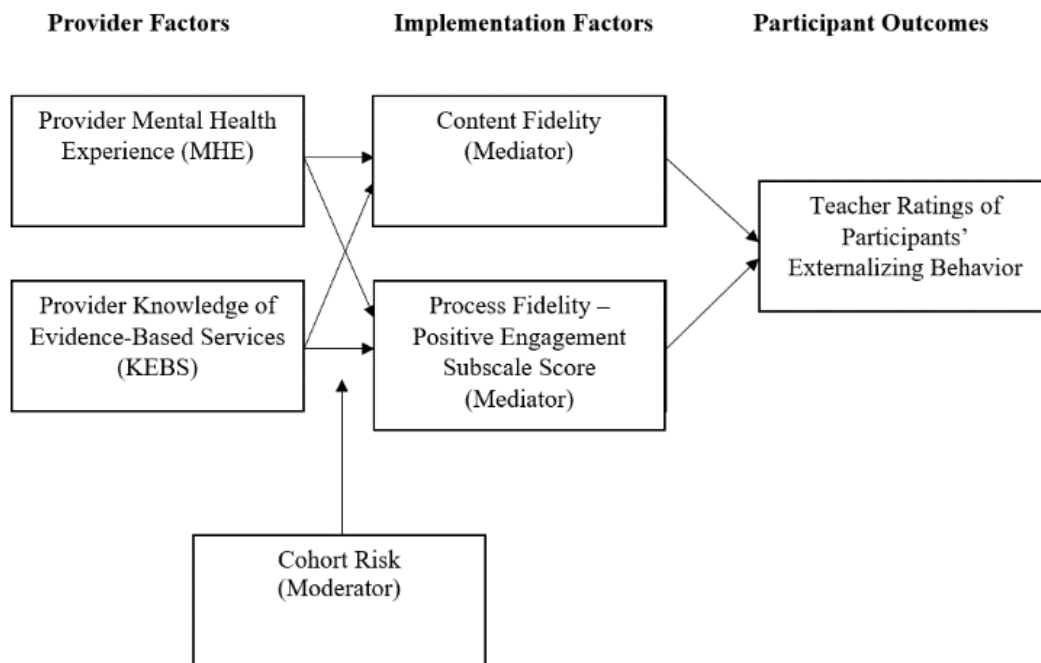
Model preparation for hypotheses 1 and 2. In this study, individual student participants are nested within their CPP cohort and CPP cohorts are nested within

providers. Since the proposed model aimed to examine student level outcomes and the mediator is at the cohort level, a three-level multi-level model was utilized to analyze the data (Pituch, Murphy & Tate, 2010), where individual student participants are at level 1, CPP cohorts are at level 2, and CPP providers are at level 3 of the analysis. To assess the first hypothesis, a random intercept, mixed-effects model was used to calculate the effects of the predictor variables related to the provider (provider's knowledge of evidence-based services and mental health experience) on the outcome variable (individual students' post-intervention TRF externalizing score). This model also assessed whether implementation variables at level 2 (CPP cohort content and process fidelity, as measured by the positive engagement subscale score) mediated the relation between provider predictor variables and student outcomes. Within the same statistical model, the second study hypothesis was addressed by determining whether cohort risk score moderated the relation between provider predictors and implementation variables. Covariates at level 1 of the analysis included individual students' baseline TRF Externalizing index score, ethnicity, race, gender, grade level (3rd-8th grade), and household income. Covariates at level 2 of the analysis included the school where each cohort took place. Covariates at level 3 of the analysis included providers' race as well as the implementation support condition to which the provider was randomly assigned (basic consultation or enhanced consultation). A graphic representation of the proposed model in this study is presented below in Figure 1.

Figure 1

Proposed Model of Relations Between Provider, Participant, and Implementation

Factors and Participant Outcomes.



Ethical Considerations: The data that was analyzed for this study was collected between 2013 and 2018 through Project ACCESS, a five-year grant project supported by the National Institute of Child Health and Human Development (NICHD) of the National Institutes of Health (NIH). The content is solely the responsibility of the author and does not necessarily represent the official views of the National Institutes of Health. The principal investigator, Ricardo Eiraldi, granted permission to release and use the data for the purposes of this research project. All data obtained for this study were collected after obtaining informed consent by parents, students, and providers. The data set used in this analysis was de-identified and cannot be linked to individual participants. This study was

approved by the University of Virginia's Institutional Review Board (Protocol #3174)
prior to data analysis.

CHAPTER IV

Results**Exploratory Factor Analysis of the Process Fidelity Measure**

Initial analysis of the process fidelity measure included examining correlations between the ten items included in the measure (see Table 4). With the exception of item 11, all other items had a correlation of at least .3 with multiple items on the measure. A multi-level exploratory factor analysis (EFA) of the process fidelity measure was conducted utilizing Mplus8 software. In this analysis, nesting in the data was accounted for with a cluster robust standard error (i.e., CPP cohorts were nested within providers). The EFA results indicated that the data was best explained utilizing a three-factor solution (see Table 5). Item 11 was removed because it did not correlate highly with other items, there were a portion of sessions which had missing values for item 11 across cohorts, and removing the item contributed to a more parsimonious factor structure. The factor loading matrix for the final three factor solution is presented in Table 6 and the reliability of each factor is presented in Table 7. There were several items that significantly loaded onto multiple factors within the three-factor structure. These items were assigned to factors based on which factor they loaded most strongly as well as whether the item aligned conceptually with other items on that factor. Items 1 and 2 were assigned to factor 1 (organization), which was conceptualized as how organized the provider was in their presentation of session content. Items 3, 6, 7, and 10 were assigned to factor 2 (positive engagement), which captured providers' ability to engage participants in the session and provide positive reinforcement to participants. Items 8, 9, and 12 were assigned to factor 3 (tone and style), which encompassed the providers' tone

and personal style of presentation (for specific wording of each item of the process fidelity measure, refer to Appendix C, page 112). Based on these aforementioned groupings, a mean score was calculated for each subscale, with each item only loading on one designated subscale. Higher scores denoted better process fidelity across all subscales.

For the purposes of this study, factor 2 of the process fidelity measure (i.e., positive engagement subscale score) was utilized in final models as the process fidelity variable. Throughout the remainder of the paper, the terms process fidelity and positive engagement subscale score (PESS) will be used interchangeably. The positive engagement subscale score was chosen as the process fidelity variable because among the three factors, the greatest number of items loaded significantly onto factor 2, making it the most reliable of the three factors ($\alpha = .82$). In addition, the items that loaded onto factor 2 adequately captured core elements of process fidelity theorized to be particularly important within group interventions targeting youth with externalizing behavior problems (e.g., engaging participants in the session content, making content relatable to participants, and providing positive reinforcement for expected behavior to mitigate the impact of disruptive or aggressive behavior during sessions). While the providers' organization and personal tone and style may be important components of process fidelity that have an influence on participant outcomes, some of these associations, such as providers' conscientiousness, warmth, professionalism, and rigidity have already been studied and documented in the CPP literature (Lochman et al., 2017). The goal of the current study was to examine the lesser understood association between providers' ability

to engage participants and manage disruptive or difficult behaviors during group sessions and participants' positive outcomes.

Descriptive Statistics of Predictors and Covariates

Descriptive statistics (means, standard deviations, minimum and maximum values) for all continuous variables included in the models are presented in Table 2, and descriptive statistics (frequencies and percentages) for all categorical variables are presented in Table 3. Correlations among all continuous and categorical variables included in the proposed models are reported in Table 8. According to Shapiro-Wilke's test of normality, the outcome variable in this study, students' post-intervention TRF Externalizing scale score, was normally distributed, $W(163) = .99, p = .54$. Across the student sample, average TRF scores were 70.73 at pre-intervention and 70.69 at post-intervention. These pre- and post-intervention sample average scores are elevated and clinically significant (both scores fall above 70, which is classified as within the "Clinical" range). These scores also indicate that on average across the sample there was minimal improvement from pre- to post-intervention in students' Externalizing behavior scale scores on the TRF. Students' post-intervention Externalizing TRF score was significantly correlated with students' pre-intervention Externalizing TRF score, $r = .70, p < .01$ as well as cohort risk score, $r = .39, p < .01$. The correlation between the outcome variable and cohort risk indicates that greater cohort risk is related to higher post-intervention TRF scores. The average cohort risk score, which is the average pre-intervention TRF Externalizing scale score among students within a cohort, was 70.73. However, the range of cohort risk scores indicates that there was considerable variation in the level of reported pre-intervention externalizing behaviors between cohorts. As would

be expected based on how the variable was calculated, cohort risk was significantly correlated with students' pre-intervention TRF Externalizing scale scores, $r = .58, p < .01$. Post-intervention TRF scores were also significantly correlated with several student and provider-level covariates (see Table 8).

Provider's knowledge of evidence-based services scores, as measured by providers' total score on the KEBSQ, ranged from 49 to 81 with a mean of 67.83. KEBS scores were non-normally distributed with moderate negative skewness of $-.59$ ($SE = .54$). A majority of providers ($n = 10$) has KEBS scores above the mean. Overall, providers' knowledge within the study sample was relatively limited, as the highest possible score on the KEBS is 160. Providers' KEBS score was significantly correlated with providers' years of mental health experience, $r = -.39, p < .01$. The negative correlation between these variables indicates that as providers' years of mental health experience increased, their KEBS decreased. Providers' KEBS was also significantly correlated with cohorts' positive engagement score, $r = .50, p < .01$, and cohorts' content fidelity score, $r = .47, p < .01$, indicating that higher KEBS scores were associated with greater process and content fidelity. There were also several significant correlations between providers' KEBS and provider and student-level covariates (see Table 8).

The average number of years of mental health experience among the provider sample was 9.22. Providers' years of experience were also non-normally distributed with high positive skewness of 1.24 ($SE = .54$). Eight of the 18 providers had no prior mental health experience. Therefore, the median of providers' mental health experience (5.50 years) is a more meaningful measure of the variable's central tendency. The data indicates that the majority of providers ($n = 10$) had at least some experience, providing

mental health services prior to implementing the CPP groups, with one third of providers ($n = 6$) having a considerable amount of experience (10 years or more). Providers' mental health experience was significantly correlated with cohorts' content fidelity, $r = -.37, p < .01$; providers' increased mental health experience was associated with decreased content fidelity. Providers' mental health experience was also significantly correlated with their assigned study condition, $r = .22, p < .01$. CPP providers with greater MHE were associated with providers assigned to the enhanced consultation condition.

CPP cohorts' Positive Engagement Subscale Scores (PESS) ranged from 2.38 to 4.77, on a scale from 1 to 5, with a mean of 3.81 across cohorts while CPP cohorts' content fidelity scores ranged from 47.5% to 96% with an average of 79.13% across cohorts. For providers with multiple cohorts, the highest range of Positive Engagement Subscale Scores between cohorts was 1.11 points while the highest range of content fidelity scores was 30.28 points (see Table 2). Positive Engagement Subscale Scores and content fidelity were significantly correlated across the entire sample, $r = .75, p < .01$, indicating that these two measures of implementation fidelity tended to trend together. When content fidelity for a given cohort was high, the cohort's process fidelity score was also likely to be high.

Proposed Model Results

In order to test the first and second hypotheses of the study, a three-level, moderated mediation model was estimated utilizing Mplus8 software. Utilizing a three-level model accounted for the nested structure of the data where individual CPP participants were nested within their cohorts and cohorts were nested within providers. The model-building framework used to analyze the models began with examining the random intercepts

model and adding additional predictor and covariate variables at each of the three successive levels. Therefore, models were generated and tested that included only level 1 variables, level 1 and level 2 variables, and one including variables at all three levels. Each model was estimated invoking FIML to account for missing data within the student-level covariate variables. Variables included at level 1 (individual student level) included students' gender, grade, ethnicity, race, primary household income, and pre-intervention TRF Externalizing scale score. Variables at level 2 (cohort level) included cohort positive engagement subscale score, cohort content fidelity score, cohort baseline externalizing behavior score (i.e., cohort risk), and school where the cohort took place. Variables at level 3 (provider level) included providers' knowledge of evidence-based services (KEBS), providers' mental health experience (MHE), providers' assigned study condition, and providers' race. All continuous variables, including the outcome variable (individual students' post-intervention TRF Externalizing scale score) were standardized (lower TRF scores indicated less reported externalizing behaviors and higher scores indicated greater externalizing behaviors). Likelihood ratio tests were conducted comparing each successive model including higher-level predictors to the simpler models to determine which model was the best fit to the data. Results of likelihood ratio tests indicated that the simplest model did not meet conventional criteria for good fit to the data and the more complicated models did not improve fit. In each case, a message in the output indicated that the model estimation reached a saddle point and that standard errors of model parameter estimates may not be trustworthy due to having more parameters than the number of clusters. This saddle point error is produced when estimates are not maximized, which is a key component of maximum likelihood estimation. However,

under the condition that standard errors are generated (as they were in the case of these models), it is reasonable that the estimates and standard errors can be interpreted as estimated (Asparouhov & Muthen, 2012).

The first model was simply a random intercept model utilized to examine the intra-class correlations (ICC) for the outcome at the cohort level (.07) and at the provider level (.01). These ICCs indicated that there was limited contribution to explanation of variance in the outcome variable accounted for by nesting within provider, and some explanation of variance by nesting at the cohort level. It should be noted that as there were some providers with a single cohort and several with only a few, and as both ICCs were relatively small, attribution of meaning to either level of nesting is not warranted. Additionally, examination of the variance of the intercept in the model suggested that a significant portion of the total variance was not explained at the cohort ($r_{0jk} = .08, p = .29$) and provider levels ($u_{00k} = .01, p = .81$).

Table 9 (page 104) shows the results of the model including variables at all three levels. The results indicated that at the student level, the coefficients for 6-8th graders, students' race, and pre-intervention TRF score were significant. These coefficients can be translated to be understood that relative to students in third grade, 6th-8th grade students' post-intervention TRF scores were .43 standard deviations lower. Non-White students' post-intervention TRF scores were .24 standard deviations lower than White students. For every 1 standard deviation increase from the mean in students' pre-intervention TRF score, post-intervention TRF scores increased .68 standard deviations. At both the cohort and provider level, none of the coefficients were significant.

Additional three-level models intended to model full mediation of cohorts' positive engagement subscale score and content fidelity score and moderation of cohort risk could not be estimated. This seems likely due to the minimal variance of the outcome variable nested at level 2 and level 3 as well as number of parameters and sample size. Therefore, both the first and second study hypotheses could not be tested with this full nested model.

Supplemental models explored whether removing the cohort level of the original three level model would result in any additional significant relations between provider characteristics, implementation variables, and student outcomes. Within these two-level models, students were at level 1 of the analysis and providers were at level 2 of the analysis. The same model building process was utilized in generating these models as was used with the three-level models. Likelihood ratio tests calculating the relative fit of each model indicated that none of the estimated models met conventional criteria for a good fit to the data. The two-level models did not produce any novel findings significantly discrepant from those obtained in the three-level models. The results of these supplemental models are presented in Appendix B.

CPP Cohorts within Provider Model Results

Given that a significant portion of the variance in the student outcome variable was not nested substantially, as anticipated, at the cohort and provider level, the dataset was transformed to remove the student-level outcome and predictor variables. Subsequently, two-level models with cohorts nested within providers were generated to explore whether the second study hypothesis, that cohort risk would moderate the relation between provider characteristics and implementation, was supported within this two-level

structure. Specifically, these two-level models examined whether the two implementation variables of interest (positive engagement subscale score and content fidelity) were predicted by provider and cohort characteristics. Within these models, level 1 (cohort level) variables included cohort risk, and level 2 (provider level) variables included providers' knowledge of evidence-based services, mental health experience, provider race and assigned support condition. A model-building framework was utilized with these models as well, beginning with examining the random intercepts model and then adding additional predictor and covariate variables at each of the two successive levels. Likelihood ratio tests were calculated to compare the models and determine which model was the best fit to the data. There was no missing data within cohort or provider-level variables, so no missing data procedure was warranted. All continuous variables were standardized.

The results of the random intercept model showed that the ICC for cohorts' positive engagement subscale score at the provider level was .68 and .63 for cohorts' content fidelity. These ICC values indicate that there was significant explanation of variance in implementation variables by nesting at the cohort and provider levels. This is further supported by model results suggesting that a significant portion of the total variance in content fidelity was nested at both the cohort level ($rij = .30, p < .01$) and provider level ($u_{0j} = .51, p = .04$). Similarly, a significant portion of the total variance in process fidelity was nested at both the cohort level ($rij = .26, p = .02$) and provider level ($u_{0j} = .58, p < .01$).

Results of the model including level 1 and level 2 variables are displayed in Table 10 (page 106). This model assessed whether cohort risk, provider characteristics, and

provider covariates predicted the outcome variables of positive engagement subscale score and content fidelity. The results of likelihood ratio tests indicated that the model including both level 1 and level 2 variables showed relative improvement in fit over the model only including level 1 variables, $\chi^2(8) = 23.04, p = .003$. At the cohort level, cohort risk was not a significant predictor of positive engagement or content fidelity. At the provider level, providers' KEBS significantly predicted positive engagement. For every 1 standard deviation increase in providers' KEBS, their positive engagement score increased by .40 standard deviations. Providers' MHE negatively predicted content fidelity: for every 1 standard deviation increase in providers' MHE, content fidelity scores decreased by .48 standard deviations. Providers' assigned study condition significantly predicted both positive engagement and content fidelity. Relative to providers assigned to the basic consultation condition, enhanced consultation condition providers' positive engagement scores were .64 standard deviations higher, and their content fidelity scores were .79 standard deviations higher.

To determine whether a model including the moderation of cohort risk of provider characteristics' relation to process and content fidelity was warranted, a model was generated that estimated the random effect of cohort. Model results suggested that the mean regression coefficients for the effect of cohort risk on content and process fidelity were both non-significant, (content fidelity = .10, $p = .66$; process fidelity = .07, $p = .71$). In addition, there was no slope variation in the cohort risk variable between providers (content fidelity = .02, $p = .87$, process fidelity = .09, $p = .07$).

Additionally, the results of likelihood ratio tests indicated that the model including the random effect was not a better fit to the data than the model including level 1 and

level 2 variables, $\chi^2(4) = 5.62$, $p = .23$. For these reasons, although this model estimated, the results were not interpreted. Therefore, the second study hypothesis that cohort risk would moderate the relation between provider characteristics and implementation could also not be adequately tested within this two-level model.

CHAPTER V

Discussion

Based on the results of three-level models with individual students nested within cohorts within providers, the first study hypothesis (that implementation variables would mediate the relation between provider characteristics and student outcome) and the second study hypothesis (that cohort risk would moderate the relation between provider characteristics and implementation) were not able to be evaluated as planned. However, there were several features of the data set and of the variance structure that might have minimized opportunity to sensitively test these relations as hypothesized. First, there was little improvement in the student outcome variable from pre- to post-intervention across the sample, rendering a small amount of change to detect in relation to key variables. In addition, the sample size, particularly at the provider level was small, straining power requirements for adequate sensitivity to detect effects. This limitation is exacerbated when applied in multi-level modeling and the three-level nesting added additional power demands for adequate sensitivity. The limited number of providers and the circumstance of most providers having one to few groups also affected the modeling analysis. The complexity of the models and number of variables included in each model also likely contributed to the difficulties in calculating the mediation and moderation effects and the multiple error messages received when calculating models. Thus, the modeling results had methodological limitations that constrained ability to test adequately the specific relations and the multivariate models. For that reason, some exploratory examination of alternative modeling approaches was undertaken. Those exercises did reveal some

informative findings about the meaning of the nesting (or lack thereof) and of the impact of provider characteristics on program implementation.

Initial examination of nesting to provide understanding of the value of attending to this statistically, did not suggest substantial nesting of the variance in individual participants' TRF post-treatment scores within group leader or cohorts; most of the variance was accounted for at individual level. When nesting of cohort within providers was assessed utilizing a two-level model to examine the relations between provider characteristics and the outcome implementation variables (process and content fidelity), results indicated that there was considerable nesting. In addition to some findings about specific relations, the examination of modeling variations helps to point out how challenging process studies can be when many of the sampling variables (e.g., to what extent there are an adequate number of providers that have similar numbers of cohorts) are not under control as design features. Second, this also points to the challenge of achieving an adequate sample size when provider is the unit of organization for analysis. While this study has a relatively large number of providers in comparison to other studies of process, it was well below the recommended minimum for testing group randomized effects (Raudenbush & Liu, 2000). It also may be that the lack of variation of the individual outcome at the cohort and provider level represent substantive findings; that students' response to the CPP intervention (or group interventions in general) is relatively independent within these groupings. This may mean that what one gains from an intervention is less dependent on who else is in the group, who the provider is, and their delivery characteristics than has been assumed. It may also be that this varies substantially depending on how structured the intervention is. The CPP is a highly

structured, manualized treatment, and high implementation fidelity was the expressed goal of the larger study from which the data was drawn. Although there was considerable variation in the amount of content and process fidelity between cohorts, generally content fidelity scores in the study were high. Therefore, characteristics of the provider or of the children included in the group may impact individual participant outcomes less than whether students received the intervention content as intended.

Variations in Student Outcome by Participant Characteristics

Despite the study hypotheses not being supported, there were nevertheless several significant and interesting findings within the comparative model analyses that warrant further interpretation and discussion. Across the estimated three-level models, the majority of the variation in the student outcome variable was at the individual level, and modeling of the student outcome variable utilizing a three-level nested approach was, therefore, not a good fit to the data. Nevertheless, there were three variables at the individual student level that were significantly associated with the outcome variable.

Teachers reported significantly less externalizing behavior scores for older students (grades 6-8), who made up 14.6% of the sample, compared with younger students (grades 3-5), who made up the majority of the study sample (85.4%). The original CPP was designed to target children and adolescents aged 8-14, and the curriculum and activities were created to align with the developmental capacities and skills of children spanning that age range. However, the results from this study imply that student outcomes may vary by age, with older students having improved outcomes relative to younger students. One possible explanation for this outcome is that the CPP requires well-developed metacognitive abilities (i.e., the ability to think about your

thoughts), self-reflection skills (i.e., describing personal anger triggers and responses to stress) and perspective-taking skills (i.e., understanding that two people can think and feel differently about a situation). These capacities may be more fully developed in older children, who are therefore more apt to be able to engage with, and benefit from, the CPP content.

Within the participant sample, non-White (i.e. African American or mixed-race) students had greater reported reductions in externalizing behavior than White (Hispanic) students. This may be attributed to the fact that non-White students comprised the majority of the study sample (~60%), while White students were the minority (~40%). However, there may also be additional factors that contributed to non-White students' greater reductions in externalizing behaviors from pre- to post-intervention that warrant more explicit evaluation, which was beyond the scope of the current study.

Variations in Implementation Outcomes by Provider Characteristics

Although provider characteristics could not be linked to student outcomes through the hypothesized pathways because of limitations in the TRF pre- and post-intervention scores, there were significant relations between provider characteristics and program implementation when modeling of student variables as individual variation was removed from the analyses. For example, providers' increased knowledge of evidence-based services (KEBS) was associated with higher positive engagement subscale scores (i.e. providers' ability to engage students, present information in ways that are relevant to the participants, and to provide positive reinforcement for expected behaviors). These results imply that providers within the sample who had more knowledge of evidence-based

services also tended to have higher implementation fidelity, as measured by process fidelity scores.

Providers' mental health experience was negatively associated with content fidelity. The more years of experience providers had, the lower their content fidelity scores. These results provide additional support for previous empirical findings (e.g., Perepletchikova & Kazdin, 2005) that mental health providers with greater experience tend to be less adherent to highly structured interventions. One theory underlying this relation that has been posited in the research is that providers with more experience are already committed to their own strategies and techniques and are more resistant to changing their approach to incorporate new, evidence-based interventions. Providers with greater experience may choose to implement some components of an EBP that align with their own theoretical orientation or comfort level but not others, contributing to decreased content fidelity. In contrast, in keeping with the findings of LeTendre et al., 2003, relatively less experienced providers without an established therapeutic toolkit are more likely to adhere to program components and therefore implement EBPs with high fidelity. An alternative interpretation of these findings, however, might be that providers with greater experience are able to make relevant adaptations to the content of the intervention to address the clinical needs of the participants. In this situation, although greater provider experience may contribute to decreased content fidelity, the impact of decreased content fidelity may be clinically indicated and contribute to improved participant outcomes. The content fidelity measure utilized in this study only captured the extent to which providers completed activities and topics as outlined in the program manual. A measure of content fidelity that assesses adherence to more general sets of guiding

theoretical principles and ideas underlying an intervention rather than specific activities may be helpful in assessing how providers' experience impacts these varying definitions of content fidelity and how deviations from these aspects of content fidelity impact outcomes.

Contrary to prior research indicating that provider knowledge and experience (Henderson, Mackay, & Peterson-Badali, 2010; Driscoll et al., 2003), participant risk (Perepletchikova & Kazdin, 2005), and implementation variables (Durlak & DuPre, 2008) have a significant impact on participant outcomes, the results of this study suggest that at least for the participant outcome variable examined, that these variables may have less impact than characteristics specific to the individual participant. However, it is important to consider that there was relatively little change on average from pre-to post-intervention in the outcome variable. It could be that changes in participants' externalizing behaviors were not evident immediately following the conclusion of the group intervention when post-treatment data was collected. Rather, observable changes in students' behavior may not occur until several months following the intervention. However, since follow-up data was not collected in this study, it cannot be determined whether provider, participant, or implementation variables may have an impact on changes in behavior following the intervention. An additional caveat to these findings is that the study only considered the relative influence of content and process fidelity on outcomes and did not assess the impact of other implementation variables such as program dosage, program reach, and adaptation. These aspects of implementation may have contributed to the participant outcomes in this study.

Nevertheless, the findings of this study are important because they imply that participants' immediate post-intervention behavioral outcomes may be less dependent on whether their provider is experienced or knowledgeable, whether the other participants in their group are high-risk, or whether the intervention is implemented with optimal fidelity. If the expressed goal of an EBP is optimizing participant outcomes, this places less emphasis on finding adequate providers, carefully choosing which students to place together in groups, and closely monitoring program fidelity, and greater emphasis on determining whether a participant has specific characteristics that indicate they would maximally benefit from the intervention. The finding that various provider characteristics differentially influenced distinct components of implementation fidelity suggests that there is merit in assessing both multiple aspects of provider qualities as well as their influence on multiple, unique facets of implementation quality.

Limitations

In addition to the previously mentioned limitations regarding the data in the current study (e.g., the lack of change on average in the student outcome variable from pre- to post-intervention and the outcome variance not being nested as anticipated at the cohort and provider level, the sample size in this study also limited the ability to observe significant, complex relations between variables. Although the sample was relatively large for a study of its kind, a greater number of individual student participants within a greater number of cohorts and providers may have provided the additional power needed to examine whether implementation variables mediated the relation between provider characteristics and student outcomes or whether cohort risk moderated the relation between provider characteristics and implementation utilizing three-level models. The specific sample in this

study also limits the generalizability of the observed findings to different demographic groups (e.g., students attending rural or suburban schools, students with higher SES, non-minority status students) or other settings in which the CPP may take place. Additionally, there were some instances where CPP session videos were unable to be recorded due to scheduling conflicts or technical difficulties, resulting in these sessions not being coded for process or content fidelity, which further limited the number of CPP sessions available for analysis.

Additional limitations include that some of the measures utilized in the current study have not been validated, examined, or supported in the literature. The CPP Content Fidelity Checklist used in this study was created by the Project ACCESS research team based on the revised version of the CPP implemented in the larger study, and its psychometric properties and reliability are unknown. The Process Fidelity Checklist was created by the original developers of the CPP and its psychometric properties have not been fully examined. The multi-level exploratory factor analysis of the process fidelity measure described in this study is only the second EFA that the author is aware of (the results of the first EFA have not yet been published) that has examined whether there are unique components of the measure that describe different aspects of process fidelity. Therefore, it remains unknown whether the data obtained from this measure have adequate construct validity or whether the operational definitions of process fidelity as outlined in the current study are accurate. Another issue pertaining to the Process Fidelity measure is that coders of the CPP session videos had difficulty meeting minimum inter-rater reliability criteria ($ICC > .80$) on their scoring of the measure, indicating several potential issues; the measure may be too subjective and prone to bias of the observer,

video coding training did not adequately prepare coders to score the measure accurately and objectively, and/or process fidelity scores utilized in this study may be an unreliable measure of the processes that occurred during the CPP sessions.

Implications and Future Directions

The results of this study can be specifically applied to implementation and outcomes associated with the CPP, but they may also be applied more broadly to group interventions that address externalizing behavior problems, and even more broadly to the implementation of EBPs within community settings. As an overall pattern, the specific significant correlations suggest that some provider characteristics may influence the quality of program implementation. In terms of individual outcome, characteristics specific to participants may overshadow the general effect of group leader, the extent to which the intervention was delivered with high fidelity, or the characteristics of the other students included in their group. In addition, there is some indication that provider experience may work against content fidelity and training focus may need to be more about the specific intervention. While on the one hand a negative relation of experience to fidelity to improved program implementation is dismaying, it may suggest that providers can be less extensively trained if the intent is to implement a manualized EBP with high implementation fidelity. This may be particularly of interest because EBPs implemented with high fidelity are more likely to produce positive outcomes, and a greater number of EBPs are being implemented in community settings (e.g., schools) where providers of such interventions may not have extensive experience.

Providers' increased knowledge of evidence-based services was significantly related to increased process fidelity, indicating that knowledge of empirical treatments is

relatively more important to effective implementation than providers' experience. However, providers within the study sample demonstrated only some knowledge of evidence-based services, as the average KEBSQ score across the sample was less than half of the total possible knowledge score on the measure. Therefore, providers need not even have an extensive or comprehensive knowledge of EBPs in order to demonstrate improved implementation. Resources should be allocated toward providing training that increase providers' knowledge of components of evidence-based treatments for specific mental health problems as well as providing ongoing support specific to the intervention throughout program implementation, rather than hiring or seeking out experienced mental health providers.

In addition to this study's implications for practice and implementation of EBPs, the results of this study also have implications for future research. First, although content and process fidelity were significantly positively correlated in this study, the findings that some provider characteristics were associated with process fidelity and others associated with content fidelity suggest that these two aspects of implementation are distinct and may be differentially related to variables of interest and outcomes. Despite the fact that process fidelity could not be reliably linked to student outcomes in this study, the relations between provider characteristics and implementation imply that there is value in examining these variables as separate implementation constructs in future research studies.

There are several solutions that can be utilized in future research to delineate relations between implementation factors that impact participant outcomes. Given the previously cited issues with the student outcome variable in this study, there is a need for

research examining additional student outcomes. Outcomes that might be examined include change in diagnostic status, improvements in coping skills, or decreases in office discipline referrals, as a few examples. In addition, to analyze complex models that take into consideration the relative influence of provider, student, and implementation factors, and how each of these variables may interact to produce student outcomes, it will be critical to conduct studies with larger sample sizes at the cohort and provider levels. It will also be important for future studies examining the relation between implementation and participant outcomes that a measure of process fidelity is developed and validated, particularly a measure that takes into consideration elements of process fidelity that are pertinent for group interventions targeting youth with externalizing behavior problems. Developing and utilizing a well-validated and supported measure will assist in making a more reliable connection between improved process fidelity and positive participant outcomes.

As the translation of EBPs into community settings continues to increase, it will be critical that additional studies attempt to understand the links between provider characteristics, participant characteristics, and effective implementation, and attribute student outcomes to each of these aspects of program implementation. Once these relations are better understood, students and providers can be thoughtfully selected and implementation strategies can be designed that maximize resources to optimize participant outcomes.

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Appendix A

Tables and Figures

Figure 2

Providers with multiple CPP cohorts

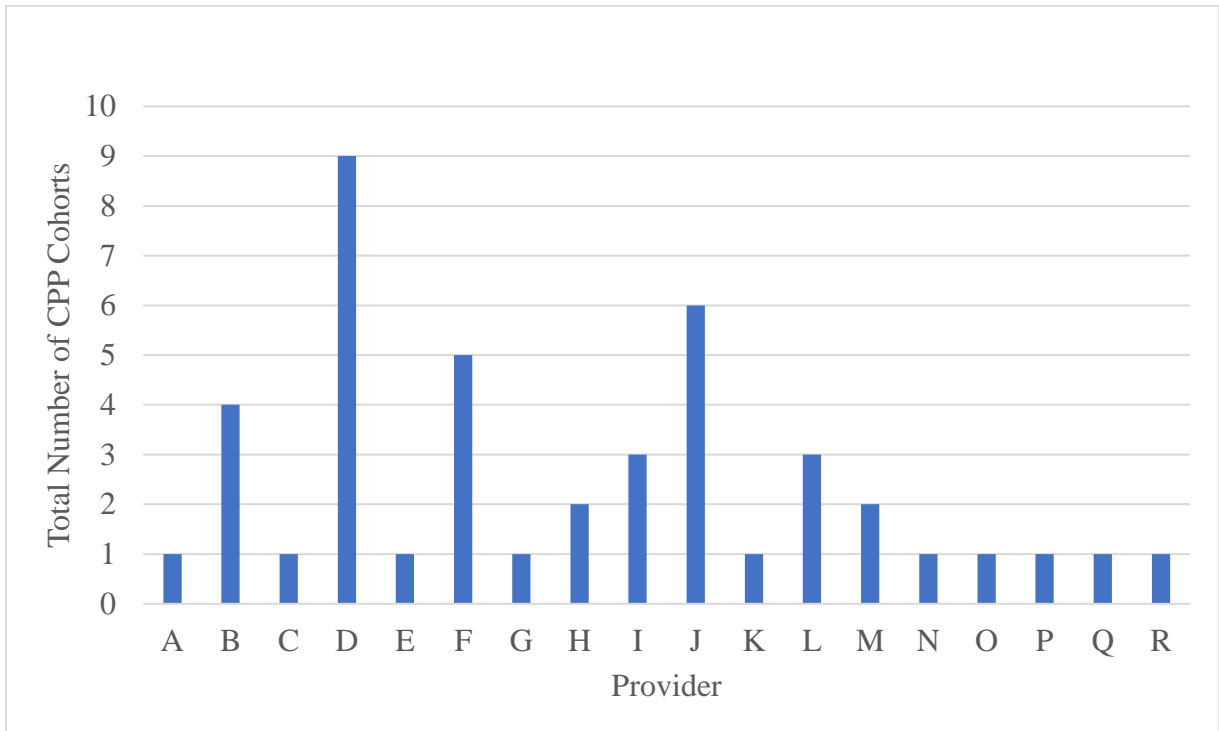


Table 2

Descriptive statistics of continuous variables

Variable	Minimum	Maximum	Mean	Standard Deviation
Providers' Knowledge of Evidence- Based Services (KEBS)	49.00	81.00	67.83	7.55
Providers' Years of Mental Health Experience (MHE)	0.00	38.00	9.22	11.27
Process Fidelity Factor 1 (organization)	3.00	4.96	4.19	.53
Process Fidelity Factor 2 (positive engagement)	2.38	4.77	3.81	.58
Process Fidelity Factor 3 (tone and style)	3.41	5.00	4.39	.43
Content Fidelity	47.54	96.00	79.13	13.85
Cohort Risk Score	53.00	87.00	70.73	4.90
TRF Externalizing Index Pre- Intervention Score	51.00	94.00	70.73	8.48
TRF Externalizing Index Post- Intervention Score	43.00	90.00	70.69	8.67

Note. TRF = Teacher Report Form

Table 3

Frequencies of categorical variables

Student-level covariates	Frequency	Percent
Gender		
Male	136	73.1
Female	50	26.9
Ethnicity		
Hispanic	110	59.1
Non-Hispanic	74	39.8
Race		
Non-White	111	59.7
White	75	40.3
School		
1	32	17.2
2	29	15.6
3	51	27.4
4	27	14.5
5	19	10.2
6	28	15.1
Grade		
3	52	28.0
4	56	30.1
5	51	27.4
6	20	10.8
7	4	2.2
8	3	1.6
Primary Household Income		
< \$10,000/year	74	39.8
Between \$10-20,000/year	50	26.9
Between \$20-30,000/year	26	14.0
Between \$30-40,000/year	18	9.7
Between \$40-50,000/year	6	3.2
Between \$50-60,000/year	2	1.1
Between \$60-70,000/year ^a	1	.5
Between \$80-90,000/year	9	4.8
Provider-level covariates		
Gender		
Female	15	83.3
Male	3	16.7
Race		
White	11	61.1
Non-White	7	38.9
Assigned Support Condition		

Basic Consultation	10	55.6
Enhanced Consultation	8	44.4

^aNo students had a reported a primary household income between \$70,000-80,000 per year

Table 4

Correlations between items on the Process Fidelity Measure

Items	1	2	3	6	7	8	9	10	11	12
1. Lesson proceeds in an orderly fashion	-									
2. Discussion strays from manualized topics onto unrelated tangents	.52**	-								
3. Counselor stimulates discussion	.47**	.22**	-							
6. Counselor stops to clarify the material	.45**	.26**	.74**	-						
7. Counselor attempts to provide examples that are relevant to the group	.41**	.17**	.64**	.70**	-					
8. Counselor's presentation seems rigid	.11**	.12**	.44**	.45**	.31**	-				
9. Counselor speaks clearly and intelligibly and has a generally good manner of presentation	.53**	.42**	.56**	.50**	.38**	.36**	-			
10. Counselor finds opportunities to praise students' on-task behavior and participation	.27**	.19**	.44**	.40**	.35**	.19**	.38**	-		
11. Counselor makes "teaching moments" out of students' behavioral challenges during group (uses the challenges as examples for session material)	.21**	-.01	.02	.09*	.16**	-.06	.00	.01	-	
12. Counselor's tone is warm and positive	.40**	.29**	.45**	.39**	.31**	.38**	.71**	.38**	-.01	-

*p < .05. **p < .01.

Table 5

Comparisons of one through three-factor solutions for the multi-level exploratory factor analysis with geomin rotation including 9 items from the Process Fidelity Measure (N = 44)

Criteria of Fit	1 Factor Solution	2 Factor Solution	3 Factor Solution
Comparative			
AIC	10677.32	10358.73	10250.65
BIC	10792.64	10508.21	10430.03
aBIC	10706.93	10397.11	10296.71
Standalone			
χ^2 (df, scaling corr)	378.80 (27, 1.31)	123.69 (19, 1.30)	44.33 (12, .87)
RMSEA (CI)	.16	.10	.07
CFI/TLI	.72/.63	.92/.84	.97/.92
SRMR	.08	.05	.02

Table 6

Factor loading and communalities based on a three-factor solution multi-level exploratory factor analysis with geomin rotation for 9 items from the Process Fidelity Measure (N = 44)

	Factor 1	Factor 2	Factor 3
	Organization	Positive Engagement	Tone and Style
Item 1: Lesson proceeds in an orderly fashion	.79*	.28	.00
Item 2: Discussion strays from manualized topics onto unrelated tangents	.48*	.00	.20
Item 3: Counselor stimulates discussion	.00	.73*	.17*
Item 6: Counselor stops to clarify the material	-.02	.89*	.01
Item 7: Counselor attempts to provide examples that are relevant to the group	.03	.85*	-.12
Item 8: Counselor's presentation seems rigid	-.27*	.32*	.38*
Item 9: Counselor speaks clearly and intelligibly and has a good manner of presentation	.15	.01	.80*
Item 10: Counselor finds opportunities to praise students' on-task behavior and participation	-.02	.29*	.28*
Item 12: Counselor's tone is warm and positive	.01	-.12	.88*

*p < .05. **p < .01.

Table 7

Descriptive statistics for the three Process Fidelity measure factors ($N_{\text{sessions}} = 527$,

$J_{\text{cohorts}} = 44$, $K_{\text{providers}} = 18$)

Factor	No. of items	<i>M</i> (SD)	Cronbach's α
1	2	4.19(.53)	.67
2	4	3.81(.58)	.82
3	3	4.39(.43)	.72

Table 8

Correlations between predictor, outcome, and covariate variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. TRF Externalizing Index Post-Intervention Score	–															
2. Providers’ Knowledge of Evidence-Based Services	.07	–														
3. Providers’ Years of Mental Health Experience	.05	-.39**	–													
4. Providers’ Gender	.08	-.71**	.24**	–												
5. Providers’ Race	-.08	-.18*	.58**	.05	–											
6. Providers’ Support Condition	-.08	-.07	.22**	-.37**	-.11	–										
7. Cohort Process Fidelity Factor 2 Mean Score	.01	.50**	-.11	-.56**	.23**	.28**	–									
8. Cohort Content Fidelity Mean Score	.00	.47**	-.37**	-.62**	-.06	.30**	.75**	–								
9. Cohort Risk (average cohort pre-intervention TRF score)	.39**	.05	.10	.25**	-.02	-.36**	-.03	-.06	–							
10. TRF Externalizing Index Pre-Intervention Score	.70**	.02	.06	.15**	-.01	-.22**	-.03	-.04	.58**	–						
11. Students’ Gender	.19*	.05	-.08	-.02	-.02	-.03	-.13	-.05	.04	.10	–					
12. Students’ School 1	.01	.27**	-.33**	-.21**	-.04	-.48**	-.10	.14	.17*	.11	.14	–				

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Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
13. Students' School 2	.06	.35**	-.26**	-.04	.02	-.45**	.27**	.17*	.24**	.15	.04	-.20**	_			
14. Students' School 3	-.16*	-.12	.22**	-.28**	.27**	.58**	.29**	.29**	-.44**	-.25**	-.10	-.28**	-.26**	_		
15. Students' School 4	.05	-.55**	.32**	.78**	.17*	-.44**	-.57**	-.75**	.08	.05	-.01	-.19*	-.18*	-.25**	_	
16. Students' School 5	-.03	-.05	.07	-.15*	-.01	.32**	.14	.24**	-.03	-.03	-.08	-.15*	-.15*	-.21**	-.14	_
17. Students' School 6	.10	.09	-.03	-.03	-.48**	.40**	-.09	-.15*	.08	.03	.02	-.19**	-.18*	-.26**	-.17*	-.14
18. Student in 3 rd Grade	.03	.06	-.09	-.16*	-.01	.09	.09	.16*	-.17*	-.08	-.03	.00	.10	.21**	-.22**	-.17*
19. Student in 4 th Grade	.10	.24**	-.05	-.11	.02	-.18*	.14	.05	.09	.09	-.05	.04	.30**	-.11	-.10	-.07
20. Student in 5 th Grade	-.10	-.13	-.01	.01	-.04	.22**	-.03	-.06	-.02	-.03	.04	-.06	-.26**	.11	.02	.11
21. Student in 6-8 th Grade	-.04	-.22**	.18*	.34**	.04	-.16*	-.25**	-.19**	.13	.03	.06	.01	-.18*	-.25**	.39**	.16*
22. Students' Ethnicity	.08	-.00	-.04	.05	.05	-.10	.08	.05	.08	.03	.06	.05	.04	-.05	.04	.04
23. Students' Race	.02	.16*	-.07	-.21**	-.06	-.01	.04	.14	.17*	.24**	.03	.29**	-.04	-.16*	-.25**	-.17*
24. Students' Primary Household Income	-.03	.00	-.15*	-.05	-.01	-.12	.04	.07	.20**	.15	.01	.21**	.08	-.07	-.13	-.04

*p < .05. **p < .01

Table 9

Results of three-level model with students nested within cohorts within providers

including level 1 (student-level covariates), level 2 (cohort-level) variables, and level 3

(provider-level) variables

Parameter	Estimate	Standard Error	Est./S.E.	Two-tailed P Value
Student level ($N_{\text{Students}} = 186$)				
DV = TRF post-intervention scores				
Gender (ref. girls)	.22	.14	1.56	.12
Grade 4 (ref. 3 rd)	-.02	.22	-.09	.93
Grade 5 (ref. 3 rd)	-.27	.18	-1.55	.12
Grade 6-8 (ref. 3 rd)	-.43	.20	-2.21	.03*
Ethnicity (ref. non-Hispanic)	.12	.17	.69	.49
Race (ref. non-White)	-.24	.12	-2.00	.05*
Primary Household Income	-.09	.05	-1.93	.05
TRF Pre-intervention Score	.68	.11	6.34	<.01**
e_{ijk}	.43	.08	5.64	<.01**
Cohort level ($J_{\text{Cohorts}} = 44$)				
DV = TRF post-intervention scores				
Risk Score	.06	.09	.67	.50
PESS	.02	.19	.08	.94
Content Fidelity Score	.09	.22	.40	.69
School 2 (ref. school 1)	.01	.21	.02	.98
School 3 (ref. school 1)	.05	.10	.47	.64
School 4 (ref. school 1)	.39	.42	.94	.35
School 5 (ref. school 1)	.12	.10	1.19	.24
School 6 (ref. school 1)	.12	.15	.81	.42
r_{ojk}	<.01	.07	.05	.96
Provider level ($K_{\text{Providers}} = 18$)				
DV = TRF post-intervention scores				
KEBS	-.01	.13	-.05	.96
MHE	.02	.11	.22	.82
Assigned Study Condition (ref. Enhanced Consultation)	.09	.14	.68	.50
Race (ref. Non-White)	-.14	.17	-.83	.41
u_{00k}	<.01	.02	.03	.98

Note. TRF = Teacher Report Form; PESS = Positive Engagement Subscale Score; KEBS

= Knowledge of Evidence-Based Services; MHE = Mental Health Experience

* $p < .05$. ** $p < .01$.

Table 10

Results of two-level model with cohorts nested within providers including level 1 (cohort-level) and level 2 (provider-level) variables

Parameter	Estimate	Standard Error	Est./S.E.	Two-tailed P Value
Cohort level ($J_{\text{Cohorts}} = 44$)				
DV = PESS				
Cohort Risk	.06	.13	.43	.67
r_{ojk}	.27	.12	2.31	.02*
Cohort level ($J_{\text{Cohorts}} = 44$)				
DV = Content Fidelity				
Cohort Risk	.07	.10	.72	.48
r_{ojk}	.33	.10	3.30	<.01**
Cohort level ($J_{\text{Cohorts}} = 44$)				
Correlation between PESS and Content Fidelity	.11	.08	1.38	.17
Provider level ($K_{\text{Providers}} = 18$)				
DV = PESS				
KEBS	.40	.13	3.00	<.01**
MHE	-.12	.20	-.60	.55
Assigned Study Condition (ref. Enhanced Consultation)	.64	.28	2.26	.02*
Race (ref. Non-White)	.67	.43	1.56	.12
u_{00k}	.24	.12	1.92	.06
Provider level ($K_{\text{Providers}} = 18$)				
DV = Content Fidelity				
KEBS	.26	.15	1.71	.09
MHE	-.48	.21	-2.26	.02*
Assigned Study Condition (ref. Enhanced Consultation)	.79	.33	2.42	.02*
Race (ref. Non-White)	.39	.46	.85	.40
u_{00k}	.13	.09	1.58	.12
Provider level ($K_{\text{Providers}} = 18$)				
Correlation between PESS and Content Fidelity	.15	.08	1.91	.06

Note. PESS = Positive Engagement Subscale Score; KEBS = Knowledge of Evidence-

Based Services; MHE = Mental Health Experience

* $p < .05$. ** $p < .01$.

Appendix B

Tables and Figures of Supplemental Models

Table 11

Results of two-level model with students nested within providers including level 1 (student-level covariates) and level 2 variables (provider-level predictors and covariates)

Parameter	Estimate	Standard Error	Est./S.E.	Two-tailed P Value
Student level ($N_{\text{Students}} = 186$)				
DV = TRF Post-Intervention Score				
School 2 (ref. school 1)	-.02	755.92	<.01	1.00
School 3 (ref. school 1)	.32	<.01	999.00	999.00
School 4 (ref. school 1)	.04	211.67	<.01	1.00
School 5 (ref. school 1)	.41	<.01	999.00	999.00
School 6 (ref. school 1)	.32	<.01	999.00	999.00
Grade 4 (ref. 3 rd)	-.01	493.20	<.01	1.00
Grade 5 (ref. 3 rd)	-.24	138.47	<-.01	1.00
Grade 6-8 (ref. 3 rd)	-.34	5.31	-.06	.95
Ethnicity (ref. Non-Hispanic)	.13	209.88	<.01	1.00
Race (ref. Non-White)	-.26	539.76	<.01	1.00
Primary Household Income	-.09	58.73	<-.01	.99
TRF Pre-Intervention Score	.73	73.55	.01	1.00
e_{ijk}	.45	262.15	<.01	1.00
Provider level ($K_{\text{Providers}} = 18$)				
DV = TRF Post-Intervention Score				
KEBS	-.01	724.61	<.01	1.00
MHE	-.02	472.56	<.01	1.00
PESS	.07	256.74	<.01	1.00
Content Fidelity Score	-.10	506.06	<.01	1.00
Assigned Study Condition (ref. Enhanced Consultation)	-.22	.00	999.00	999.00
Race	-.14	399.61	<.01	1.00
u_{00k}	<.01			

*p < .05. **p < .01.

Table 12

Results of two-level model with students nested within providers including level 1 (student-level covariates), level 2 variables (provider-level predictors and covariates), and mediated effect of positive engagement and content fidelity

Parameter	Estimate	Standard Error	Est./S.E.	Two-tailed P Value
Student level ($N_{\text{Students}} = 186$)				
DV = TRF Post-intervention score				
School 2 (ref. school 1)	-.02	.23	-.09	.93
School 3 (ref. school 1)	.32	<.01	999.00	999.00
School 4 (ref. school 1)	.04	1.08	.03	.97
School 5 (ref. school 1)	.41	<.01	999.00	999.00
School 6 (ref. school 1)	.32	<.01	999.00	999.00
Grade 4 (ref. 3 rd)	-.01	1.84	-.01	1.00
Grade 5 (ref. 3 rd)	-.24	1.54	-.16	.88
Grade 6-8 (ref. 3 rd)	-.34	1.47	-.23	.82
Ethnicity (ref. non-Hispanic)	.13	1.28	.10	.92
Race (ref. non-White)	-.26	.83	-.31	.75
Primary household income	-.09	.20	-.46	.65
TRF Pre-intervention Score	.73	.13	5.46	<.01**
e_{ijk}	.45	.14	3.21	<.01**
Provider level ($K_{\text{Providers}} = 18$)				
DV = TRF Post-intervention score				
KEBS	-.01	.22	-.04	.97
MHE	-.02	.84	-.03	.98
PESS	.07	1.28	.06	.96
Content Fidelity Score	-.10	1.07	-.10	.92
Assigned Study Condition (ref. Enhanced Consultation)	-.22	111.53	<-.01	1.00
Race (ref. non-White)	-.14	2.38	-.06	.95
u_{00k}	<.01	1.04	<.01	1.00
Provider level ($K_{\text{Providers}} = 18$)				
DV = Providers' PESS				
KEBS	.39	1.14	.34	.73
MHE	.15	.56	.27	.79
u_{00k}	.66	.60	1.09	.28
Provider level ($K_{\text{Providers}} = 18$)				
DV = Providers' Content Fidelity Score				
KEBS	.23	1.06	.22	.83

MHE	-.29	1.13	-.26	.80
<i>u00k</i>	.59	2.77	.21	.83

*p < .05. **p < .01.

Appendix C
Study Measures

Coping Power Program Process Fidelity Checklist

Process Fidelity for Child Intervention Groups (COPING POWER)

Adapted from: Lochman, J.E., Powell, N.P., Boxmeyer, C.L., Qu, L., Wells, K.C., Windle, M. (2009). Implementation of a School-Based Prevention Program: Effects of Counselor and School Characteristics, *Professional Psychology: Research and Practice*,40(3), 476-482.

School: _____ **Counselor:** _____

Session Number: **Date:** _____ **Rater:** _____

1. Lessons proceeds in an orderly fashion.

- Not at all Sometimes Very Often

Time Noted in Session: _____ (00:00 minutes:seconds)

Notes:

2. Discussion strays from manualized topics onto unrelated tangents.

- Not at all Sometimes Very Often

Time Noted in Session: _____

Notes:

3. Counselor stimulates discussion.

- Not at all Sometimes Very Often

Time Noted in Session: _____

Notes:

4. Students share personal examples related to the topic.

- Not at all Sometimes Very Often

Time Noted in Session: _____

Notes:

5. The emotional tone of the students' responses indicates enthusiasm about the session.

- Not at all Sometimes Very Often

Time Noted in Session: _____

Notes:

6. Counselor stops to clarify the material.

- Not at all Sometimes Very Often

Time Noted in Session: _____

Notes:

-
7. Counselor attempts to provide examples that are relevant to the group.
 Not at all Sometimes Very Often

Time Noted in Session: _____

Notes:

8. Counselor's presentation seems rigid.
 Not at all Sometimes Very Often

Time Noted in Session: _____

Notes:

9. Counselor speaks clearly and intelligibly and has a generally good manner of presentation.
 Not at all Sometimes Very Often

Time Noted in Session: _____

Notes:

10. Counselor finds opportunities to praise students' on-task behavior and participation.
 Not at all Sometimes Very Often N/A

Time Noted in Session: _____

Notes:

11. Counselor makes “teaching moments” out of students’ behavioral challenges during group (uses the challenges as examples for session material).

- Not at all Sometimes Very Often N/A

Time Noted in Session: _____

Notes:

12. Counselor’s tone is warm and positive.

- Not at all Sometimes Very Often

Time Noted in Session: _____

Notes:

Coping Power Program Content Fidelity Checklist

Instructions: The adherence checklists are used to determine whether or not the objectives of each session were accomplished. The group leader should ensure that the content of each session is delivered; however this can be done in a flexible and creative manner. Please complete the checklist within 48 hours of the session

Date: _____ School: _____

Group Leader: _____

Rater: _____

Coping Power Session 1: Introduction, Group Structure, and Goal Setting		
Did the group leader do the following in today's session:	Yes	No
1. Establish an agenda		
2. Discuss group purpose and structure		
3. Introduce and review group rules		
4. Discuss behavior management system		
5. Complete group cohesion activity		
6. Introduce goal setting concepts		
7. Add up points from the current session and distribute prizes		
TOTAL # YES ITEMS		
TOTAL # ITEMS		
ADHERENCE PERCENTAGE (total # yes/total # items)		

Notes: _____

Instructions: The adherence checklists are used to determine whether or not the objectives of each session were accomplished. The group leader should ensure that the content of each session

is delivered; however this can be done in a flexible and creative manner. Please complete the checklist within 48 hours of the session

Date: _____ School: _____

Group Leader: _____

Rater: _____

Coping Power Session 2: Emotional Awareness		
Did the group leader do the following in today's session:	Yes	No
1. Establish an agenda		
2. Review session 1 content		
3. Identify components of emotional states		
4. Identify starters for emotional states		
5. Identify anger cues, levels, starters, & coping strategies		
6. Add up points from the current session and distribute prizes		
TOTAL # YES ITEMS		
TOTAL # ITEMS		
ADHERENCE PERCENTAGE (total # yes/total # items)		

Notes:

Instructions: The adherence checklists are used to determine whether or not the objectives of each session were accomplished. The group leader should ensure that the content of each session

is delivered; however this can be done in a flexible and creative manner. Please complete the checklist within 48 hours of the session

Date: _____ School: _____

Group Leader: _____

Rater: _____

Coping Power Session 3: Anger, Coping, & Self-Control		
Did the group leader do the following in today's session:	Yes	No
1. Establish an agenda		
2. Review session 2 content		
3. Introduce the idea of coping with anger		
4. Practice anger coping and self-control with game		
5. Explicit practice of self-instruction anger coping strategies		
6. Add up points from the current session and distribute prizes		
TOTAL # YES ITEMS		
TOTAL # ITEMS		
ADHERENCE PERCENTAGE (total # yes/total # items)		

Notes:

Instructions: The adherence checklists are used to determine whether or not the objectives of each session were accomplished. The group leader should ensure that the content of each session is delivered; however this can be done in a flexible and creative manner. Please complete the checklist within 48 hours of the session

Date: _____ School: _____

Group Leader: _____

Rater: _____

Coping Power Session 4: Overcoming Barriers to Self-Control		
Did the group leader do the following in today's session:	Yes	No
1. Establish an agenda		
2. Review session 3 content		
3. Teach self-control through deep breathing		
4. Identify and overcome barriers to self-control		
5. Add up points from the current session and distribute prizes		
TOTAL # YES ITEMS		
TOTAL # ITEMS		
ADHERENCE PERCENTAGE (total # yes/total # items)		

Notes:

Instructions: The adherence checklists are used to determine whether or not the objectives of each session were accomplished. The group leader should ensure that the content of each session is delivered; however this can be done in a flexible and creative manner. Please complete the checklist within 48 hours of the session

Date: _____ School: _____

Group Leader: _____

Rater: _____

Coping Power Session 5: Perspective Taking Part I		
Did the group leader do the following in today's session:	Yes	No
1. Establish an agenda		
2. Review session 4 content		
3. Introduce Perspective Taking		
4. Identify different perspectives of a social situation		
5. Brief introduction of blind spots and tunnel vision		
6. Add up points from the current session and distribute prizes		
TOTAL # YES ITEMS		
TOTAL # ITEMS		
ADHERENCE PERCENTAGE (total # yes/total # items)		

Notes:

Instructions: The adherence checklists are used to determine whether or not the objectives of each session were accomplished. The group leader should ensure that the content of each session is delivered; however this can be done in a flexible and creative manner. Please complete the checklist within 48 hours of the session

Date: _____ School: _____

Group Leader: _____

Rater: _____

Coping Power Session 6: Perspective Taking Part II		
Did the group leader do the following in today's session:	Yes	No
1. Establish an agenda		
2. Review session 5 content		
3. Introduce the 4 main groupings of intentions		
4. Reinforce 'accidental' and 'unclear/don't know' attributions of ambiguous social problems		
5. Integrate blind spots and identifying motives		
6. Add up points from the current session and distribute prizes		
TOTAL # YES ITEMS		
TOTAL # ITEMS		
ADHERENCE PERCENTAGE (total # yes/total # items)		

Notes:

Instructions: The adherence checklists are used to determine whether or not the objectives of each session were accomplished. The group leader should ensure that the content of each session is delivered; however this can be done in a flexible and creative manner. Please complete the checklist within 48 hours of the session

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Group Leader: _____

Rater: _____

Coping Power Session 7: Social Problem Solving Part I		
Did the group leader do the following in today's session:	Yes	No
1. Establish an agenda		
2. Review session 6 content		
3. Introduce problem solving		
4. Introduce the PICC Model		
5. Teach the "Pick It Apart" Method		
6. Practice the "Pick It Apart" Method		
7. Add up points from the current session and distribute prizes		
TOTAL # YES ITEMS		
TOTAL # ITEMS		
ADHERENCE PERCENTAGE (total # yes/total # items)		

Notes:

Instructions: The adherence checklists are used to determine whether or not the objectives of each session were accomplished. The group leader should ensure that the content of each session is delivered; however this can be done in a flexible and creative manner. Please complete the checklist within 48 hours of the session

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Group Leader: _____

Rater: _____

Coping Power Session 8: Social Problem Solving Part II		
Did the group leader do the following in today's session:	Yes	No
1. Establish an agenda		
2. Review session 7 content		
3. Explore problem identification and choice formation		
4. Identify consequences		
5. Evaluate consequences		
6. Add up points from the current session and distribute prizes		
TOTAL # YES ITEMS		
TOTAL # ITEMS		
ADHERENCE PERCENTAGE (total # yes/total # items)		

Notes:

Instructions: The adherence checklists are used to determine whether or not the objectives of each session were accomplished. The group leader should ensure that the content of each session is delivered; however this can be done in a flexible and creative manner. Please complete the checklist within 48 hours of the session

Date: _____ School: _____

Group Leader: _____

Rater: _____

Coping Power Session 9: Social Problem Solving Part III		
Did the group leader do the following in today's session:	Yes	No
1. Establish an agenda		
2. Review session 8 content		
3. Demonstrate differences between automatic and deliberate thinking		
4. Illustrate how decisions can be made based on consequences		
5. Add up points from the current session and distribute prizes		
TOTAL # YES ITEMS		
TOTAL # ITEMS		
ADHERENCE PERCENTAGE (total # yes/total # items)		

Notes:

Instructions: The adherence checklists are used to determine whether or not the objectives of each session were accomplished. The group leader should ensure that the content of each session is delivered; however this can be done in a flexible and creative manner. Please complete the checklist within 48 hours of the session

Date: _____ School: _____

Group Leader: _____

Rater: _____

Coping Power Session 10: "Think Aloud" Role Plays to Review		
Did the group leader do the following in today's session:	Yes	No
1. Establish an agenda		
2. Review and "Think Aloud" Role Play for Identifications of Starters as Cues to Use Coping Strategies		
3. Review and "Think Aloud" Role Play for Focusing & Ignoring		
4. Review and "Think Aloud" Role Play for Anger Coping Self-Statements		
5. Review and "Think Aloud" Role Play for Breathing/Relaxation & Overcoming Barriers to Self-Control		
6. Review and "Think Aloud" Role Play for Social Problem Solving		
7. Add up points from the current session and distribute prizes		
TOTAL # YES ITEMS		
TOTAL # ITEMS		
ADHERENCE PERCENTAGE (total # yes/total # items)		

Notes:

Instructions: The adherence checklists are used to determine whether or not the objectives of each session were accomplished. The group leader should ensure that the content of each session is delivered; however this can be done in a flexible and creative manner. Please complete the checklist within 48 hours of the session

Date: _____ **School:** _____

Group Leader: _____

Rater: _____

Coping Power Session 11: Social Problem Solving with Peers in the Community		
Did the group leader do the following in today's session:	Yes	No
1. Establish an agenda		
2. Review session 10 content		
3. Illustrate and discuss peer pressure as well as ways of resisting peer pressure; introduce refusal skills		
4. Introduce machoism		
5. Introduce racial/ethnic differences		
6. Explore snitching and appropriate snitching		
7. Add up points from the current session and distribute prizes		
TOTAL # YES ITEMS		
TOTAL # ITEMS		
ADHERENCE PERCENTAGE (total # yes/total # items)		

Notes:

Instructions: The adherence checklists are used to determine whether or not the objectives of each session were accomplished. The group leader should ensure that the content of each session is delivered; however this can be done in a flexible and creative manner. Please complete the checklist within 48 hours of the session

Date: _____ School: _____

Group Leader: _____

Rater: _____

Coping Power Session 12: Group Creates & Watches Video Part I		
Did the group leader do the following in today's session:	Yes	No
1. Establish an agenda		
2. Review session 11 content		
3. Discuss video project and begin planning		
4. Begin filming video		
5. Add up points from the current session and distribute prizes		
TOTAL # YES ITEMS		
TOTAL # ITEMS		
ADHERENCE PERCENTAGE (total # yes/total # items)		

Notes:

Instructions: The adherence checklists are used to determine whether or not the objectives of each session were accomplished. The group leader should ensure that the content of each session is delivered; however this can be done in a flexible and creative manner. Please complete the checklist within 48 hours of the session

Date: _____ **School:** _____

Group Leaders: _____

Rater: _____

Coping Power Session 13: Group Creates & Watches Video Part II		
Did the group leader do the following in today's session:	Yes	No
1. Establish an agenda		
2. Review session 12 content		
3. Continue filming video		
4. Add up points from the current session and distribute prizes		
TOTAL # YES ITEMS		
TOTAL # ITEMS		
ADHERENCE PERCENTAGE (total # yes/total # items)		

Notes:

Instructions: The adherence checklists are used to determine whether or not the objectives of each session were accomplished. The group leader should ensure that the content of each session is delivered; however this can be done in a flexible and creative manner. Please complete the checklist within 48 hours of the session

Date: _____ **School:** _____

Group Leaders: _____

Rater: _____

Coping Power Session 14: Review & Termination		
Did the group leader do the following in today's session:	Yes	No
1. Establish an agenda		
2. Review session 13 content		
3. Review general purpose of the program & material learned		
4. Review Game 1		
5. Review Game 2		
6. Certificates of Completion		
7. Discuss memories of group and feelings about termination		
8. Add up points from the current session and distribute prizes		
TOTAL # YES ITEMS		
TOTAL # ITEMS		
ADHERENCE PERCENTAGE (total # yes/total # items)		

Notes:
