AN INITIAL EXAMINATION OF TEACHERS' BELIEFS AND BEHAVIORS IN RESPONSE TO THE INCREDIBLE YEARS TEACHER CLASSROOM MANAGEMENT PROGRAM

By

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ABSTRACT

AN INITIAL EXAMINATION OF TEACHERS' BELIEFS AND BEHAVIORS IN RESPONSE TO THE INCREDIBLE YEARS TEACHER CLASSROOM MANAGEMENT PROGRAM

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This study examined the transportability of the Incredible Years Teacher Classroom Management (IYTCM) Training program, with a focus on changes in personal implementer factors. Personal implementer factors are the personal characteristics (e.g., individual beliefs, perceptions) of those who serve as the primary implementers of interventions. Dependent measures included preschool teacher-reported use and perceptions of classroom management strategies, observed preschool teacher-use of classroom management strategies, preschool teachers' classroom management self-efficacy, preschool teachers' self-reported attitudes towards adopting evidence-based practices, and preschool teachers' perceptions of implementation barriers. Using a single-group design, preschool teachers (N=17) participated in six IYTCM group training across a six-month period. Data collection occurred at pre-, mid- and post-intervention time points. Linear mixed model (LMM) analyses were used to determine intervention effects on participating preschool teachers' perceptions and behaviors. Generalized linear mixed model (GLMM) analyses were used to examine the relationship between changes in beliefs and changes in participating preschool teachers' use of classroom management strategies. Finally, descriptive statistics and LMMs were used to evaluate participating preschool teachers' perceptions of barriers to implementing behavioral interventions. With regards to preschool teachers' perceptions, only participants' perceptions of implementation barriers were found to significantly decrease over the intervention period. Results also suggest that participating

preschool teachers' observed use of positive and negative classroom management strategies did not significantly change over the course of the intervention period. Finally, changes in participating preschool teacher beliefs were not found to relate to changes in their classroom management strategy use. These results are discussed in relation to the transportability of the IYTCM to real-world contexts, as well as limits associated with implementation barriers (i.e., small sample size).

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CHAPTER 1

INTRODUCTION

The identification of evidence-based mental health prevention and intervention services has become a priority at both federal and state levels (Chambers, Ringeisen, & Hickman, 2005). Evidence-based practice (EBP) is defined as the "integration of the best available research within clinical expertise in the context of patient characteristics, culture, and preferences" (American Psychological Association, 2005). Evidence-based intervention (EBI) is a term used to describe specific prevention and intervention programs that have demonstrated positive outcomes for target populations in multiple well-designed, evaluation studies (Forman et al., 2013). Within the EBP and EBI movement, schools have been implicated as the primary setting in which to provide mental health and behavioral services to children and youth (Rones & Hoagwood, 2000). In 2003, President Bush's New Freedom Commission on Mental Health proposed that, because students' emotional and behavioral health are closely related to their school successes, "schools are in a key position to identify mental health problems early and to provide a link to appropriate services." Most recently, the Affordable Care Act signed by President Obama has had significant implications regarding the amount of funding schools receive towards providing mental and behavioral health services. To begin, the School-Based Health Center Program was authorized under the Affordable Heath Care Act, which appropriated \$200 million in funding from 2010 to 2013 for the creation of new school-based health center sites and the expansion of preventative and primary health care services in existing school-based health center sites. In 2013, the health care law was expanded to include behavioral health services, such as supports for mental illness and drug and alcohol problems (Beronio, Glied, & Frank, 2014). In 2014, President Obama's Fiscal Year Budget outlined a \$130 million initiative to improve mental health outcomes for

young people through state-based programs, as well as to help train school-based professionals, such as teachers, to recognize signs of mental illness in students and to refer students to appropriate services. As a result of policies such as these, increased government funding is being dedicated to the dissemination and implementation of EBPs and EBIs in child and adolescent mental and behavioral health (e.g., Chambers et al., 2005; Owens, Lyon, Brandt, Warner, Nadeem, Spiel, & Wagner, 2014). For example, the National Institute of Mental Health (NIMH) has organized multiple initiatives to advance research and practice activities related to children's mental health, with specific projects that focus on the ways in which schools can serve as key service delivery systems (Chambers et al., 2005). Similarly, the Office of Special Education Programs has funded several centers that aim to bridge the gap between research of EBPs/EBIs and the implementation of EBPs/EBIs in schools (Owens et al., 2014). In addition to efforts at the federal level, multiple states and foundations have jumpstarted initiatives that aim to enhance school-based mental health and behavioral supports as well (Chambers et al., 2005).

In general, the fields of school psychology and education have made great strides, in terms of identifying efficacious interventions that can positively support students' emotional, behavioral, social, and academic outcomes (Forman et al., 2013). However, despite increases in national and state-level funding, and the progress made by specific interest groups in identifying evidence-based supports, EBIs are frequently underused in educational settings (Ennett, Ringwalt, Thorne, Rohrbach, Vincus, Simons-Rudolph, & Jones, 2003; Hicks, Shahidullah, Carlson, & Palejwala, 2014). This disconnect between research and practice is highly problematic, considering that children cannot reap the benefits of EBIs if they are not implemented, or implemented with poor fidelity. This highlights the increased importance of implementation science, in which transportability research is conducted to examine the process

of implementing EBIs within educational settings, as well as the factors that facilitate or impede this process (Forman et al., 2013).

Although multiple implementation frameworks have been proposed, in their systematic review of the literature Myers and colleagues (2012) report that the available frameworks share similar features across the areas of assessment strategies, decisions about adaption, capacitybuilding strategies, creating a structure for implementation, ongoing implementation support strategies, and improving future applications. One of the available implementation science frameworks, proposed by Fixsen and colleagues (2005), focuses on the WHAT, WHO, and HOW of the implementation process. To begin, they argue that active implementation requires knowing "WHAT the intervention is prior to attempting to use it in practice" (Ogden & Fixsen, 2014). This includes understanding the empirical nature of the program, as well as having a clear sense of the program content and procedures (e.g., theoretical framework, useable intervention criteria). Next, the WHO refers to the individual, or group of individuals, who actively work to implement programs or practices, while taking into account the stages of implementation and the factors that impact implementation (Odgen & Fixen, 2014). These individuals are often referred to as "purveyors," "change agents," "facilitators," or "implementation teams" within the literature. Finally, they state that HOW interventions are supported in practice can be best understood by identifying the variables that facilitate or impede the implementation process. The systems- and individual-level factors that influence implementation processes and outcomes have been discussed and categorized within multiple implementation frameworks (Durlak & DuPre, 2008; Fixsen, Blasé, Naoom, & Wallace, 2009). One such factor that has been discussed within available implementation frameworks, but has rarely been empirically studied, is personal implementer characteristics (Fixsen, Naoom, Blasé, Friedman & Wallace, 2005). Personal

implementer characteristics refer to the individual-level factors that relate to implementation fidelity and outcomes, such as individual attitudes towards innovation, skill proficiency, and access to implementation supports (i.e., training, coaching; Durlak & DuPre, 2008).

To date, much of the available research has focused on the ways in which training and/or coaching supports enhance implementation outcomes, with much less focus on the ways in which practitioner beliefs and attitudes influence outcomes, specifically with regard to schoolbased interventions (Fixsen et al., 2005; Han & Weiss, 2005). It is important to understand implementation processes from an ecological perspective by taking into account the multiple and complex systems that influence school-based program outcomes. However, it is also important to consider the influence of individual beliefs, given that practitioners, themselves, must decide to change their behavior and adopt a new strategy. Hence, what may be most related to practitioners' implementation behaviors are their beliefs and perceptions, given that cognitive change is an important precursor to behavior change (Aarons, 2004; Bandura, 1989). While social cognitive theory serves as a strong foundation on which to explore the relationship between cognitions and behaviors, there is a gap within the implementation science literature, with regard to the ways in which practitioners' beliefs relate to their effective implementation of EBIs, particularly within educational contexts. Much of the currently available literature has relied on case study, qualitative, and narrative methodologies. Therefore, quantitative exploration of personal implementer characteristics (i.e., practitioners' attitudes and beliefs) in relation to school-based implementation of EBIs is a necessary step in closing the research-to-practice gap in school-based mental health and behavioral services.

Although school psychologists serve as key facilitators in the dissemination and implementation of EBIs in educational settings, teachers frequently serve as the primary

implementers of EBIs in the classroom context (Forman et al., 2013). Teachers reportedly perceive themselves as being the primary implementers of classroom-based behavioral interventions; however they indicate a general lack of experience and training in how to support children's behavioral needs (Reinke, Stormont, Herman, Puri, & Goel, 2011). This may be due to the overall lack of pre-service training teachers receive in how to address student needs through the use of empirically-based classroom management strategies; classroom management strategies can serve as a preventative and systems-level intervention approach to addressing students' behavioral concerns (Koller & Bertel, 2006). It may also reflect the fact that teachers generally do not receive continued professional development or coaching supports in these issues once they enter the teaching profession, most likely due to the fact that educational settings lack the personnel and financial resources to provide these supports. A third possible explanation is that teachers' personal beliefs regarding classroom management practices may deter them from adopting more effective strategies for managing problem behaviors (Bambara, Goh, Kern, & Caskie, 2012). For instance, a teacher who may be resistant to research-based approaches, may not believe an EBI will result in a positive outcome for his or her students, or may have low selfefficacy in his or her ability to implement an EBI (e.g., Gutner & Denny, 1996; Tschannen-Moran & McMaster, 2009); these types of beliefs may make it less likely that a teacher will deviate from his or her current practices in order to adopt a new, more effective, strategy. Resistance to adopting evidence-based interventions in classroom management is concerning considering the research which indicates that ineffective classroom management strategies result in a myriad of negative student outcomes (Kellam, Ling, Merisca, Brown, & Ialongo, 1998), as well as increased burnout amongst teachers (Beaman & Wheldall, 2000) and elevated levels of teacher-reported stress (Clunies-Ross, Little, & Kienhuis, 2008). By comparison, evidence-based

classroom management strategies reduce students' disruptive behaviors in the classroom (e.g., Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999) and promote students' engagement, academic achievement, and school readiness skills (Webster-Stratton, Reid & Hammond, 2004). These findings implicate classroom management strategies as key mechanisms of change, in terms of supporting students' outcomes through teachers' use of EBIs. Therefore, finding ways to enhance teachers' perceptions, and use, of empirically-based classroom management strategies, as well as factors that impede their use of these strategies within their classrooms, is critical, in terms of promoting both teacher and student outcomes.

It is also important that the identified methods for supporting teachers' classroom management skills are feasible within the school context. More specifically, teacher supports must be efficient, effective, and require limited resources if schools are to successfully adopt, implement, and sustain them over time. For example, an approach which has only been recently proposed in the research literature, is the application of a multi-tier framework to teacher professional development (Myers, Simonsen, & Sugai, 2011; Thompson, Marchant, Anderson, Prater, & Gibb, 2012), in which supports are provided on a continuum (Fuchs & Fuchs, 2006). When applied to teachers' professional development, multi-tier frameworks can help schools allot personnel and financial resources (e.g., ongoing professional development training, coaching supports) to teachers who not only demonstrate the most need, but who are also the most receptive and responsive to these supports (Myers et al., 2011; Thompson et al., 2012). Hence, understanding not only how teachers' beliefs shape their receptivity to professional development training in a targeted skill (e.g., classroom management), but also what types of beliefs are most related to their willingness to try and adopt novel strategies, is essential.

This line of research may be especially important within the context of preschool teachers and programs. First, providing children with high quality early childhood education opportunities has become of increased importance at the national level, given the research that has demonstrated the ways in which strong preschool programs (i.e., those that employ evidencebased instructional and classroom management practices) help to improve children's school readiness and decrease the risk of negative outcomes, particularly for at-risk populations (e.g., Head Start populations; Fuligni, Howes, Lara-Cinisomo, & Karoly, 2009). Second, early childhood education can be provided in various types of settings (i.e., public preschools, private preschools, family child care programs) and teachers' training and educational requirements can vary across each of these settings (Fuligni et al., 2009). Therefore, preschool teachers are an important subset of educators that may benefit from professional development supports in classroom management, to ensure that high-quality, evidence-based practices are being employed across preschool contexts.

The Incredible Years Teachers Classroom Management (IYTCM) is a highly-reputable teacher professional development program that trains preschool through early elementary teachers in evidence-based classroom management strategies (Reinke, Stormont, Webster-Stratton, Newcomer & Herman, 2012). The efficacy of this program, in terms of enhancing teachers' skills in classroom management, is well documented within the literature (e.g., Webster-Stratton, Reid, & Hammond, 2001; Webster-Stratton et al., 2004; Webster-Stratton, Reid, & Stoolmiller, 2008). Additionally, outcomes of effectiveness studies suggest that implementation of variations of the IYTCM program result in positive teacher and student outcomes in real-world contexts (e.g., Baker-Henningham, Walker, Powell, & Gardner, 2009; Carlson, Tiret, Bender, & Benson, 2011; Hutchings, Daley, Jones, Martin, Bywater, & Gwyn,

2007). Multiple adaptions of the ITYCM program have undergone study within the research literature with promising results, such as delivering the IYTCM program as a self-study version (Shernoff & Kratochwill, 2007), adjusting the length of, and length between, IYTCM training sessions (Carlson et al., 2011; Hicks, Carlson, & Tiret, 2015; Snyder et al., 2011), and pairing IYTCM training with coaching supports (Raver, Jones, Li-Grining, Metzger, Champion, & Sardin, 2008; Shernoff & Kratochwill, 2007; Snyder et al., 2011).

However, only one study has attempted to examine the variables related to the transportability of the IYTCM program (Shernoff & Kratochwill, 2007). In their study of the self-administered videotape version of the IYTCM program, Shernoff & Kratochwill (2007) examined personal implementer factors, including participants' access to consultation supports and participants' attitudes towards the self-administered IYTCM training and implementation processes. Their results indicated that teachers who received more intensive implementation supports (i.e., self-administered training plus consultation) reported greater confidence in managing behavior problems and demonstrated greater use of positive classroom management strategies compared to teachers who received less intensive implementation support (i.e., selfadministered training). Furthermore, Shernoff & Kratochwill (2007) reported that teachers most frequently cited "time" as a significant barrier to learning the IYTCM strategies. Although Shernoff & Kratochwill (2007) discuss teachers' perceptions of the IYTCM training, they failed to adequately address how teachers' beliefs changed in response to training and how evolving beliefs related to teachers' response to the intervention program. Continued efforts to identify the personal implementer factors that relate to the implementation of EBIs, such as the IYTCM program strategies, are essential, in terms of closing the research-to-practice gap that currently exists within the domains of mental health, education, and school psychology.

Purpose of Current Study

This study examined the transportability of an EBI program, the Incredible Years Teacher Classroom Management (IYTCM) program, with a focus on the ways in which personal implementer factors, specifically preschool teachers' perceptions and attitudes, related to program outcomes. More specifically, this study investigated how preschool teachers' attitudes towards adopting EBIs, their perceptions of the IYTCM strategies, and their self-efficacy in classroom management changed in response to their participation in the IYTCM group trainings. This study also examined how changes in preschool teachers' beliefs related to changes in their behavior, in terms of their use of classroom management strategies. Finally, this study explored preschool teachers' perceptions of the barriers they encounter when implementing behavioral interventions in the classroom and whether or not the IYTCM group trainings serve to reduce perceptions of implementation barriers.

CHAPTER 2

LITERATURE REVIEW

In order to address the conceptualization of this study, the following sections will describe 1) the role of implementation science in enhancing mental and behavioral health services in schools, 2) theories and models of implementation science, 3) personal implementer factors, 4) the Incredible Years Teacher Classroom Management (IYTCM) program, 5) evidence of IYTCM program efficacy, 6) evidence of IYTCM program effectiveness.

Implementation Science

Implementation science, also referred to as the diffusion of innovation within the literature, has been recognized as an important line of research across fields of mental health, education, and psychology (Schoenwald & Hoagwood, 2001). Implementation science can be defined as the "scientific study of methods to promote the systematic uptake of research findings and evidence-based practices into professional practice and public policy" (Forman et al., 2013). Both the Report of Surgeon General's Conference on Children's Mental Health (2000) and the NIMH Blueprint (2001) propose that implementation science research be prioritized, so that "factors that facilitate or impede the processes, transportability, or sustainability of evidencebased treatments," and how these factors "relate to dissemination and uptake of effective clinical services" be identified (National Advisory Mental Health Council Workshop on Children and Adolescent Mental Health Intervention Development and Deployment, 2001, p.75). Within implementation science exists a key distinction between implementation practices and intervention practices (Fixsen, Naoom, Blasé, Friendman, & Wallace, 2005). Implementation practices are the methods used by implementation agents (e.g., coaches, trainers, supervisors) to promote users' (e.g., practitioners, parents) use of EBIs. In comparison, intervention practices are the methods used by intervention agents (e.g., practitioners, teachers, parents) to influence a desired change in a target individual or group of individuals (e.g., students, children). The study of factors related to both implementation practices and intervention practices is important, in terms of advancing the effective adoption, use, and sustainability of EBIs (Dunst, Trivette, & Raab, 2013).

Schools serve as excellent settings in which to conduct implementation science research, considering that a large research-to-practice gap exists within the context of school-based mental health and behavioral services (Hoagwood & Johnson, 2003). While research has made great advances in the identification of efficacious prevention and intervention practices and programs, there is limited research in how to best disseminate and implement these programs in public systems (i.e., implementation practices; Hoagwood & Johnson, 2003). This is reflected by the fact that, despite the increased identification of EBIs, they remain underused in educational settings (Ennett et al., 2003; Evans, Koch, Brady, Meszaros, & Sadler, 2013; Hicks et al., 2014). Additionally, the fidelity of implementation often varies, which has significant effects on intervention outcomes (Durlak & DuPre, 2008). Inconsistent implementation fidelity may be a result of adaptations practitioners must make in order to fit the needs of their local context. It may also be the case that practitioners encounter implementation barriers that impede their ability to implement an EBI as it was intended to be implemented (Lendrum & Humphrey, 2012). In either instance, if EBIs are not successfully integrated into school contexts, students and teachers will not be able to reap the benefits of the interventions as documented in efficacy research.

The implementation of EBIs in school settings is a complicated and complex process, one in which a myriad of real-world contextual factors may affect successful adoption and

implementation efforts. Therefore, it is important to conduct effectiveness research within the unique setting of schools in order to identify the factors that influence program implementation (Owens & Murphy, 2004; Owens, Lyon, Brandt, Warner, Nadeem, Spiel, & Wagner, 2014). Furthermore, effectiveness research will help to differentiate the factors that serve as key mechanisms of change, and therefore should not be altered, from the factors that can be adapted to meet the needs of the local context without affecting desired outcomes (Lendrum & Humphrey, 2012). In conducting this type of research, researchers and practitioners will be better able to ensure that implementation of "proven" programs within schools results in positive outcomes for key stakeholders, including teachers, students, and families (Cappella, Reinke, & Hoagwood, 2011).

Theoretical models of implementation science. Various models of implementation have been proposed to explain the multiple factors that contribute to successful diffusion, uptake, and sustainability of evidence-based practices (Forman et al., 2013). To begin, Durlak and DuPre (2008) propose that a multilevel ecological perspective is needed to understand effective implementation. This proposal relies heavily on ecological systems theory, which highlights the importance of understanding the ways in which social systems are interrelated and interdependent, as well as the ways in which the interconnectedness of systems influence the outcomes of individuals embedded within those systems (Bronfenbrenner, 1979). Durlak and DuPre's (2008) proposed ecological framework for understanding effective implementation stipulates that an organization's success in implementation is dependent upon variables related to the following five categories: innovations (e.g., characteristics of the innovation), providers (e.g., characteristics of individual providers), communities (e.g., community level factors such as politics, funding, and policy), the prevention delivery system (e.g., organizational features,

practices, and staffing considerations), and the prevention support system (e.g., training and technical assistance). Support for each of the proposed categories was provided in their metaanalysis of 81 studies related to factors affecting implementation processes (Durlak & DuPre, 2008).

Fixen and colleagues (2010) have proposed a similar model for understanding the variables that affect implementation, which includes three categories of Implementation Drivers: Organization Drivers, Leadership Drivers, and Competency Drivers. First, Organizational Drivers include three variables that influence implementation: systems intervention (i.e., economic, culture, political, policy environments), facilitative administration (i.e., level of administrative support), and the use of decision-support data-systems (Fixsen et al., 2009). Second, Leadership Drivers are conceptualized as the ways in which barriers to implementation are addressed and resolved by innovation leaders, including technical issues such as limited resources (i.e., time, funding) and adaptive issues, such as a lack of motivation or consistency amongst implementers (Fixsen et al., 2009). Finally, Competency Drivers refer to the personal implementer factors that affect program implementation, including the training practitioners receive in the program/practice, the continued support (i.e., coaching or consultation services) they receiving in developing their competencies in the delivery of that program/practice, and their attitudes towards, or perceptions of, the program/practice (Fixsen et al., 2009).

Although conceptualized in slightly different manners, there is considerable overlap between these two models. To begin, in each model the individual influence of these implementations factors/drivers, as well as the interactions amongst them, on the implementation process and outcomes is strongly emphasized. Additionally, implementation factors/drivers are described as integrated and compensatory (Durlak & DuPre, 2008; Fixsen et al., 2005). The

integration of these drivers is meant to indicate that implementation of evidence-based programs relies upon the collective and connected nature of these variables. For example, there should be internal consistency amongst these variables to ensure that all resources and supports are working towards the same implementation outcome goal. These variables are also compensatory, in that the weakness of one implementation driver (e.g., staff attitudes) can be compensated for by a strength of a different implementation driver (e.g., training). Finally, although their terminology slightly differs (e.g., personal-implementer characteristics versus competency drivers), both models highlight similar factors at the systems- and individual-levels that relate to implementation processes and outcomes

The study of implementation drivers in how they relate to EBI outcomes is essential, particularly within the school context where a large research-to-practice gap exists (Fixsen et al., 2005; Hicks et al., 2014). While it is important to study the implementation process from an ecological perspective by taking into account the multiple variables that interact to influence implementation processes, it may be especially important to focus on the ways in which provider characteristics relate to implementation outcomes. This may be important for a number of reasons. First, given the likelihood that schools will have limited resources to devote to implementation efforts (e.g., Cook, Lyon, Kubergovic, Wright, & Zhang, 2015; Fixsen et al., 2005), the study of personal characteristics will help to address the important question, "for *whom* will the innovation be most effective and beneficial?" Addressing this question will help to ensure that implementation resources are allotted accordingly and thus, their positive impact maximized. Second, many of the proposed implementation factors/drivers are conceptually dependent upon personal characteristics. For example, in Durlak and DuPre's (2008) proposed model, innovation characteristics are defined as the adaptability and compatibility of the

innovation; these authors state that innovations must be flexible in order to fit the *needs of implementers*, in order to increase the likelihood that implementers will engage in strong implementation practices. Similarly, both models note the value of strong innovation leadership, in that innovation leaders must promote collaborative decision making amongst key stakeholders in response to barriers to implementation; this includes navigating barriers related technical issues such as the limited resources (i.e., time, funding) available to implementers and adaptive issues such as lack of motivation or consistency amongst implementers (Durlak & DuPre, 2008; Fixsen et al., 2009). Therefore, innovation leaders must be well aware of, and responsive to, personal implementer characteristics and needs.

Finally, both models highlight the importance of providing implementers with training resources to ensure that they are adequately prepared to implement targeted intervention skills (Durlak & DuPre, 2008; Fixsen et al., 2009). Durlak and DuPre (2008) emphasize that trainings must not only "help providers develop mastery in specific intervention skills, but also attend to their expectations, motivations, and sense of self-efficacy, because the latter can affect their future performance in and support of new innovation" (p. 338). Previous implementation research supports this, in a study of a school district's adoption of a multi-tiered system of support for students' social-emotional and behavioral concerns (Cook et al., 2015). In their survey of implementation coaches, Cook and colleagues (2015) report high mean ratings of coaches' perceptions of the importance of targeting teachers' beliefs during the implementation process; they indicated that targeting teachers' beliefs helped them to navigate instances of teacher resistance and promote teachers' adoption and implementation of the targeted EBPs.

In sum, in the broader study of implementation processes and the factors that influence implementation outcomes, examination of personal characteristics may serve as an important

first step within this line of inquiry. While factors at the systems- and intervention-level may make it more likely, or easier, for an individual practitioner to adopt and implement a new intervention strategy, practitioners' personal beliefs regarding the intervention and their beliefs on whether they can successfully implement the intervention, may be most directly related to and influential on their implementation behaviors. Unfortunately, personal characteristics in relation to EBI implementation are rarely discussed or evaluated within the implementation science literature (Fixsen et al., 2005). The limited available research, however, does suggest that beliefs and attitudes influence practitioners' adoption and use of EBIs (e.g., Nelson & Steele, 2007). Furthermore, social cognitive theory yields a strong theoretical framework on which implementation science research can examine the ways in which personal characteristics, such as practitioners' attitudes and beliefs, influence intervention adoption and outcomes.

Social Cognitive Theory

In Bandura's (1989) social cognitive theory, a triadic, reciprocal model is used to understand the ways in which personal, environmental, and behavioral factors interact in order to serve as determinants of human behavior. Personal factors including cognitions, affect, and biological events, all shape the ways in which environmental stimuli are interpreted (Bandura, 1989). Bandura (1989) emphasized the importance of self-referent thought, referring to the way in which individuals interpret and evaluate their own thinking and behavior; this includes both outcome expectancy beliefs and efficacy beliefs (Pajares, 1996). Outcome expectancy beliefs may be defined as "a person's estimate that a given behavior will lead to certain outcomes" (Bandura, 1977; p.193). In comparison, efficacy beliefs can be defined as"...the conviction that one can successfully execute the behavior required to produce the outcomes" (Bandura, 1977; p.193). For example, in relation to intervention implementation, whether or not an individual

engages in the intervention behavior may be, in part, determined by his or her 1) belief that his/her behavior (e.g., engagement in an EBI) will lead to a certain outcome and 2) belief that he/she has the ability to successfully execute the behavior (e.g., EBI strategy) in order to achieve the desired outcome. While the current implementation science literature does not discuss practitioners' characteristics in these specific terms, this theory does align with the proposed importance of examining the role beliefs play in intervention adoption and implementation.

Within the currently available implementation science literature, it has been proposed that there are four provider characteristics that relate to implementation outcomes: practitioners' recognized need for the innovation, their perceived benefits of the innovation, their self-efficacy beliefs related to the innovation, and their skill proficiency (Durlak & DuPre, 2008). With the increased emphasis being placed on EBIs within school contexts, it may also be important to consider the ways in which school-based practitioners' attitudes towards EBIs relate to their receptivity towards EBIs. The following section will review these provider characteristic variables in relation to practitioners' adoption of school-based evidence-based interventions; where available, there will be a specific focus given to teachers' use of evidence-based classroom management strategies.

Provider Characteristics Related to EBI Adoption and Implementation

Expectancy beliefs. Expectancy beliefs, although partially governed by self-efficacy beliefs, can still be considered independent predictors of performance and motivation (Bandura, 1989). Unfortunately, within the available school-based implementation science literature, discussions of expectancy beliefs are vague and unclear, in that they are often reflected by single survey items or discussed in terms of "treatment acceptability" or general attitudes towards EBPs/EBIs. For example, in their meta-analysis of 81 quantitative and qualitative studies,

Durlak and DuPre (2008) came to the broad conclusion that practitioners who recognized a need for the intervention and expected that the intervention would result in positive outcomes were more likely to implement the intervention with greater fidelity.

A more specific example is Forman and colleagues' (2009) study of 94 individuals who had taken a graduate course on school-based psychosocial interventions. Researchers found that these practitioners rated the following perception to be a facilitator to EBI implementation: the belief that the intervention would have a positive effect on students. In comparison, practitioners rated the following perceptions to serve as barriers to EBI implementation: belief that the intervention was not applicable to the situation or the student's needs, and the belief that the intervention would not affect students in a positive way. While not discussed in terms of practitioners' outcome expectancy beliefs, this study's findings still convey the importance of practitioners' expectations in relation to their EBI implementation.

Practitioners' acceptability of EBIs might also reflect their expectancy beliefs related to EBP/EBI outcomes. Intervention acceptability can be defined as "a judgment by teachers and other support personnel as to whether or not intervention is appropriate, effective, and manageable" (Gutner & Denny, 1996; p.16). Previous research suggests that a wide range of factors influence teachers' acceptability of EBIs, including the intervention type, the required materials or resources, time needed to plan or implement the intervention, and evidence of the intervention's effectiveness (Gutner & Denny, 1996).

Previous research suggests that acceptability ratings are significantly related to implementation outcomes. For instance, in a study of 362 elementary school teachers, teachers received training in a school-based prevention and character and development (SACD) program, then were asked to report on their acceptability of the program (Beets, Flay, Vuchinich, Acock,

Li, & Allred, 2008). Acceptability of the SACD program was measured by survey items such as, "the time required by *Positive* Action is well worth it in improved student behavior and classroom management" and "I personally benefit from teaching *Positive Action*." It was found that teachers' self-reported acceptability of the program positively related to the amount of the program curriculum they delivered, which in turn related to greater program utilization. Similarly, in a national study of middle school teachers' (n = 1905) implementation of a substance use prevention curriculum, teachers' self-reported acceptability of the curriculum (i.e., how much they liked teaching substance use prevention lessons, how effective they believed the curriculum to be) significantly related to the fidelity of their implementation of the program (Ringwalt et al., 2003). Finally, Klimes-Dougan and colleagues (2009) examined practitioners' beliefs in relation to the implementation of the Early Risers "Skills for Success" conduct problems prevention program in 27 rural elementary schools. Researchers found that practitioners' belief that the program would be successful positively related to implementation fidelity.

Self-efficacy beliefs. As previously defined, self-efficacy refers to a self-belief regarding whether or not one can accomplish a task (Bandura, 1977). Bandura proposed that self-efficacy is derived from four main sources of information: personal accomplishments (i.e., personal mastery experiences), vicarious experience (i.e., seeing others perform a task), verbal persuasion (i.e., verbal suggestions from others that one can successfully perform a task), and physiological states (i.e., personal state of emotional arousal; Bandura, 1977). Within the field of education research, teacher self-efficacy beliefs have been broadly defined as whether a teacher believes he or she is capable of accomplishing tasks related to educating students and managing student behavior (Tschannen-Moran & McMaster, 2009). While teacher self-efficacy was initially

thought to be a unitary construct, researchers now consider it to be a multi-dimensional in nature, inclusive of instructional efficacy, engagement efficacy, and classroom management self-efficacy (Aloe, Amo, & Shanahan, 2014).

Teacher self-efficacy has been noted as an important line of research, considering that self-efficacy is a significant predictor on teachers' receptivity to change and willingness to adopt new practices (Tschannen-Moran et al., 2009). Teachers with higher self-efficacy have been found to be more open to new ideas and more willing to try new approaches (e.g., Gaudreau, Royer, Frenette, Baumont, & Flanagan, 2013). This holds true for teachers' classroom management self-efficacy (CMSE), in that the types of strategies teachers select and use to manage students' behaviors are often related to their CMSE. For example, Andreou & Rapti (2010) found that elementary school teachers' high levels of CMSE positively predicted their selection of positive classroom management strategies (e.g., use of positive incentives); in comparison, low levels of CMSE were found to relate to teachers' selection of negative classroom management strategies (e.g., use of punishment, threats).

Attitudes towards EBPs/EBIs. Another type of belief that may be critical to consider within implementation science research is practitioners' attitudes towards EBPs/EBIs, given the tension that often exists amongst practitioners' beliefs regarding the importance of research findings versus clinical judgment (Aarons, 2004; Nelson & Steele, 2007; Nelson, Steele, & Mize, 2006). This is a new line of inquiry within research that has been primarily examined within the fields of medicine and mental health. For example, in a national survey study of 214 mental health practitioners, it was reported that practitioners' attitudes towards research (e.g., relevancy of research to their clinical work, researchers' understanding of practitioners' needs, importance of clinical judgment compared to research) significantly predicted their self-reported use of

EBPs, when controlling for variables such as theoretical orientation and clinical setting (Nelson & Steele, 2007). In a qualitative examination of mental health practitioners' (n = 19) attitudes towards EBPs, Nelson and colleagues (2007) highlighted important themes. First, a common belief amongst practitioners was that research in support of EBPs was not applicable to their clinical work, with implications for an increased need for applied research within clinical contexts. Second, identified barriers to using EBPs included a lack of time to learn new approaches, as well as a lack of adequate training in EBPs. Finally, focus group interviews revealed a wide range of attitudes towards EBPs, in that members of the first group seemed generally open to the use of EBPs, whereas the second group communicated resistance towards, and dislike of, EBPs with no discernable reason as to why this difference between groups emerged.

Given the increased emphasis placed upon EBPs/EBIs within educational contexts (Forman et al., 2013), evaluations of teachers' attitudes towards EBPs/EBIs is critical. Research indicates that teachers may lack a familiarity with, or understanding of, the term EBP (Reinke, Stormont, Herman, Puri, & Goel, 2011). Additionally, the disconnect between the availability of EBPs and teachers' use of EBPs (e.g., Ennett et al., 2003; Forman et al., 2013) suggests the presence of an implementation barrier, such as teachers' attitudes towards, or perceptions of, EBPs/EBIs. In support of this, Cook and colleagues (2015) found that teachers' beliefs towards EBPs significantly related to implementation outcomes. Furthermore, researchers found that implementation, resulted in positive increases in teachers' supportive beliefs; changes in beliefs were found to positively predict implementation outcomes as well (Cook et al., 2015). This suggests that teachers' beliefs regarding EBPs can change in response to professional

development supports, and that this type of cognitive change has significant implications for teachers' behavioral change.

Perceptions of implementation barriers. Previous research suggests that a number of external factors may serve as barriers to school professionals' implementation of EBIs, such as educational policy, lack of resources, lack of funding supports, and lack of accessible training or coaching supports (Forman, Olin, Hoagwood, Crowe, & Saka, 2009; Hicks et al., 2014; McGoey et al., 2014; Reinke et al., 2011). For instance, program developers of behavioral interventions have identified educational policy, such as No Child Left Behind, to be a significant barrier to the adoption and implementation of behavioral EBIs in schools (Forman et al., 2009).

Hence, even if practitioners expect EBIs to result in positive outcomes, believe they can successfully achieve positive outcomes, and have the necessary skills to do so, there may be perceived *external* factors that keep them for successfully adopting and implementing EBIs. Therefore, it may also be important to explore the types of factors teachers' perceive to be significant barriers to their adoptions and use of EBIs. For instance, in a survey study of 67 elementary school teachers, it was reported that 12 out of the 19 proposed barriers were rated as extremely serious, in relation to teachers' implementation of behavioral EBIs; the highest rated barriers included class size, the severity of the students' problem behavior, a lack of time to analyze and to implement interventions (McGoey, Rispoli, Venesky, Schaffner, McGuirk, & Marshall, 2014). These types of barriers may be perceived by teachers as external, uncontrollable, factors that limit their ability to implement EBIs, even when they have the desire and skill to do so.

Skill proficiency. Training practitioners receive in EBIs is important to provide them with the necessary skills required for implementation (Fixsen et al., 2005). Despite the

documented importance of training in EBIs, teachers rarely receive the preservice training, or follow-up coaching supports, in how to adequately address students' mental health and behavioral needs (Koller & Bertel, 2006). For example, in a recent study, 292 teachers from five school districts were surveyed on their perceptions of current mental health needs in schools, as well as their perceived roles in addressing those needs (Reinke et al., 2011). Results indicated that although teachers identified themselves as being the main implementers of classroom-based behavioral interventions, they reported a lack of experience and training in how to provide these services. Similarly, in a survey study of 363 early childhood and elementary school teachers, it was found that only 44% of teachers reported feeling confident that the interventions they selected would have positive outcomes for the target students, which raises questions of teachers' skills and knowledge in intervention selection and implementation (Stormont, Reinke, & Herman, 2011).

Professional development training is one way to address teachers' lack of knowledge and skill in the delivery of effective classroom management strategies. Previous research has identified a number of effective professional development training techniques, including didactic instruction, modeling, role-playing, and in-class direct training methods (Slider, Noell, & Williams, 2006). The majority of the available literature has focused on a combination of these training methods. For example, Zan and Donegan-Ritter (2014) examined the effects of an eightmonth multi-component model of professional development on the topic of enhancing teacher-child interactions. Head Start teachers were randomly assigned to an intervention (n=38) or control (n=22) group. Teachers of the intervention group participated in four bimonthly three-hour interactive workshops, monthly video-based teacher self-reflection, peer coaching and mentoring activities. Following these activities, intervention teachers demonstrated significant

increases in their behavior management skills, their quality of feedback, and their language modeling skills in comparison to teachers of the control condition.

As previously noted, professional development training must not only target skill development, but teachers' cognitions and motivation as well (Durlak & DuPre, 2008). Previous research supports the notion that professional development training can result in cognitive change for participants, which is an important component of lasting behavior change (Aarons, 2004). For example, Cook and colleagues (2015) examined the influence of teachers' beliefs on MTSS implementation outcomes. First, they found that teachers' beliefs regarding the MTSS practices significantly increased from pre- to post-implementation time points. Second, they found that, not only were beliefs at both pre- and post-implementation time points predictive of implementation outcomes, changes in beliefs from pre- to post-implementation time points significantly predicted implementation outcomes as well.

Research has been conducted on the evolution of practitioners' beliefs as a result of training in EBPs/EBIs in other professional contexts, as well. For instance, in a study of 42 graduate students in professional psychology doctoral programs, researchers found that participants' attitudes towards EBPs became significantly more favorable following their involvement in a course on specific evidence-based treatment approaches, such as cognitive-behavioral therapy and behavioral parent training (Bearman, Wadkins, Bailin, & Doctoroff, 2014). Lim and colleagues (2012) found similar results in their examination of community mental health providers, whose EBP-related beliefs changed in response to their participation in workshops on youth anxiety. More specifically, they found that following participation in professional development workshops, mental health providers' attitudes towards EBPs—

specifically their ratings of EBP appeal and openness to using EBPs as measured by the Evidence-Based Practice Attitude Scale—significantly and positively increased.

Finally, a limited, but convincing, body of research indicates that professional development training supports teachers' self-efficacy beliefs (e.g., Ross & Bruce, 2007). In a randomized field trial evaluating the effects of professional development training of sixth grade mathematics teachers (n = 106), Ross and Bruce (2007) found that teachers who received professional development training reported significantly higher levels of CMSE on the Teachers' Sense of Efficacy Scale compared to control group teachers. Similarly, Gaudrea and colleagues (2013) conducted a quasi-experimental design in which elementary school teachers were randomly assigned to either an experimental group (n = 30) or a waitlist control group (n = 26). Teachers in the experimental group received in-service training in classroom management across eight, three-hour monthly training sessions that included discussions of relevant literature and case studies, group discussions about their personal experiences, and reflections on teachers' respective practices. Results indicated that, in comparison to the waitlist control group, teachers in the experimental group demonstrated significant pre- to post-intervention increases in their CMSE. Finally, Tschannen-Moran and McMaster (2009) examined the differential effects of four professional development formats in relation to teachers' self-efficacy for adopting a new strategy. Training formats increased in intensity, in which an additional training component was added to each group condition: 1) one three-hour informational workshop, 2) the addition of 20 minutes of experts modeling the target strategy, 3) the addition of a one-and-a-half hour practice session for participants, and 4) the addition of coaching supports. Ninety-three kindergarten through second grade teachers were randomly assigned to one of the four conditions and completed the Teacher Sense of Efficacy scale at pre- and post-intervention time points.

Researchers found that teachers in all four conditions demonstrated increases in their selfefficacy beliefs. However, teachers who received the most intensive training supports (i.e., fourth condition) demonstrated the greatest gains in both self-efficacy and implementation of the target skill.

In sum, these studies' findings speak to the importance of beliefs, as well as changes in beliefs, on successful implementation of interventions targeting students' social, emotional, and behavioral needs. However, there is a lack of research that examines changes in beliefs, such as CMSE, in relation to observations of teachers' classroom management behaviors (e.g., Gaudrea et al., 2013). Furthermore, it remains unclear clear whether different types of teacher beliefs (i.e., perceptions of EBPs, CMSE) relate to EBI outcomes differentially. Hence, continued research on personal-implementer characteristics is necessary, in order to enhance our understanding of the personal beliefs that make some individuals more receptive and responsive to EBI training efforts, thus allowing schools to more efficiently and effectively disseminate their resources and supports. This may help to inform pre-selection methods that can be used for identifying staff members who are the most open to receiving training support, resulting in the increased likelihood that selected staff will benefit from the training (Lim, Nakamura, Higa-McMillan, Shimabukuro, & Slavin, 2012). This is especially applicable to the trainings schools offer in evidence-based classroom management practices, considering that teachers' beliefs regarding students' problem behaviors and classroom management have been identified as key barriers to their use of EBIs for behavioral issues (Bambara et al., 2012).

The Incredible Years Teacher Classroom Management (IYTCM) Program

The Incredible Years Teacher Classroom Management (IYTCM) program is one component of the Incredible Years Series, a triad of evidence-based prevention programs for

parent, teachers, and children used to promote and support the social and emotional competencies for children under the age of twelve. The IYTCM program specifically targets teachers' use of effective classroom management strategies as key mechanisms of change, in terms of improving child outcomes. By improving their use of empirically-supported classroom management strategies, teachers can effectively address students' challenging behaviors, as well as promote the social and emotional growth of all students. The IYTCM program is one way in which school districts can support teachers' knowledge and skills in addressing students' mental health and behavioral needs. The following sections will outline the theoretical framework of the IYTCM program and provide a description of the IYTCM program curriculum. The currently available literature on the efficacy and effectiveness of the IYTCM program will also be reviewed.

Theoretical framework. The IYTCM program is grounded in cognitive social learning theory (Webster-Stratton, 2012). When applied to children's challenging behaviors, social learning theory posits that the adoption and use of challenging behaviors (i.e., aggression, noncompliance) is learned through observation and then refined through reinforced practice (Bandura, 1987). Teachers who reinforce students' problematic behaviors through the use of ineffective classroom management strategies (e.g., reactive punishment, unclear expectations) may inadvertently contribute to the development and maintenance of such behaviors. In contrast, the use of effective classroom management strategies (e.g., consistent reinforcement for prosocial behaviors) can help teachers disengage from patterns of negative or coercive interactions with students (Shores, Gunter, & Jack, 1993).

IYTCM uses methods such as video modeling and role-play, which allows teachers to observe, learn, and practice the classroom management strategies targeted within the curriculum.
During activities in which teachers are practicing their new skills, the IYTCM leader provides feedback, which serves to either correct teachers' use of negative or ineffective classroom management strategies or reinforce their use of positive, empirically-supported classroom management strategies (Reinke et al., 2012).

IYTCM program overview. The IYTCM is a group-based training program in which teachers are trained in research-based classroom management strategies across a series of workshops. Program developers recommend that the IYTCM curriculum be delivered across six full day workshops led by certified IYTCM leaders, resulting in 42 total hours of training. However, within the literature program delivery ranges from 28 to 36 hours; program developers approve of this variation and attest that the IYTCM curriculum is meant to be flexible and adaptable in order to meet the needs of the teachers and the context of training. Coaching is an important element of the IYTCM program. Serving as coaches, the IYTCM leaders are able to facilitate the teaching and practicing of classroom management skills using a variety of techniques, such as video-modeling, role-play, discussion, reflection, and hands-on assignments. During these activities, teachers are able to reflect on, and practice, their skills during the sessions, as well as in-between sessions. Furthermore, this format allows IYTCM leaders to engage in ongoing coaching, supporting teachers by observing and providing performance feedback and assisting teachers in their problem-solving and goal-setting related to students' challenging behaviors and their use of the targeted classroom management strategies to address and correct those behaviors (Reinke, Stormont, Herman, Wang, Newcomer, & King, 2014).

Over the course of the six workshops, the program curriculum is divided into the following six topics: 1) building positive relationships with students, 2) preventing behavior problems—the proactive teacher, 3) the importance of teacher attention, coaching and praise, 4)

motivating children through incentives, 5) decreasing inappropriate behavior, and 6) emotional regulation, social skills, and problem solving. Also discussed within the curriculum are strategies for building and maintaining the home-school partnership (Webster-Stratton, 2011). The IY Training Pyramid serves as a pictorial representation of the program content; it is used to help participants conceptualize components of effective classroom environments, as well as the sequence of the training program. Teachers are taught that strategies depicted at base of the pyramid should be used liberally, as these strategies serve as the foundation of effective classroom management. Strategies depicted near the top of the pyramid should be used selectively, in order to address only the severest of misbehaviors.

Evidence of IYTCM Program Efficacy

Efficacy trials are the first step towards documenting the empirical nature of a prevention or intervention program. During an efficacy trial, an intervention is tested under optimal conditions (i.e., well-funded, ample resources, well-trained intervention personnel; Flay et al., 2005). The efficacy of the IYTCM program has been examined by program developers in four randomized control trials (RCTs; Reinke et al., 2012).

In the first trial, researchers examined the efficacy of IYTCM when paired with the IY parent program (Webster-Stratton, Reid, & Hammond, 2001). Using a sample of 272 Head Start children, along with their parents and their teachers, researchers found that teachers who received IYTCM trainings reported significantly higher rates of parent involvement in comparison to control teachers. Children of trained teachers were observed to display increased rates of prosocial behaviors and decreased rates of peer aggression; effect sizes were not reported. In the second RCT including 133 children diagnosed with conduct problems, IYTCM was found to be efficacious when implemented in adjunct to both the IY parent and child

programs (Webster-Stratton et al., 2004). Specifically, teachers who participated in IYTCM group trainings were less critical, less harsh, used more praise, and reported feeling more confident; effect sizes for teacher outcome variables, across the conditions that included the TCM training component, ranged from 0.46 to 0.63. IYTCM trained teachers also reported increased academic competence of their students. The third RCT used a matched design with sample of 153 teachers and 1,768 students (Webster-Stratton et al., 2008). The intervention group received trainings in both the IYTCM and IY child program. Teachers trained in IYTCM were observed to use more positive classroom management strategies, with effect sizes ranging from 0.51 to 1.24. Furthermore, students of trained teachers showed an increase in social competence and school readiness, as well as a decrease in conduct problems. Finally, the fourth RCT used a wait-list control design with a sample of 105 teachers and 1,817 students within an urban context (Reinke, Herman, & Dong, under-review). In three sequential annual cohorts of 15 to 20 teachers, participants of the experimental condition participated in three sets of two fullday trainings over across a five-month period led by doctoral-level IYTCM group leaders. Results indicated that students of teachers in the IYTCM condition demonstrated improved social emotional regulation, prosocial behavior, and social competence, with the greatest improvements for those students who displayed the greatest levels of difficulties at the outset of the intervention period; effect sizes reportedly ranged from 0.13 to 0.14.

Evidence of IYTCM Program Effectiveness

One limitation associated with efficacy trials is that their results are heavily dependent upon the optimal conditions of the research study and as a consequence, cannot be generalized to the real world conditions in which practitioners are expected to implement interventions on a day-to-day basis (Flay et al., 2005). Hence, effectiveness trials, which examine intervention

outcomes under naturalistic conditions, better portray the empirical nature of an intervention program (Flay et al., 2005). Effectiveness research also allows for the study of implementation, which includes the process of putting a program into place and all of the elements that affect the implementation process (i.e., Implementation Drivers).

Several effectiveness trials have been conducted on the IYTCM program (Reinke et. al, 2012). Baker-Henningham and colleagues (2009) conducted a pilot study of the Incredible Years TCM in five Jamaican preschools with 24 teachers. In a matched, experimental design, schools were assigned to either the control or experimental condition. Teachers in the experimental condition received eight to nine full days of training in IYTCM, as well as additional support implementing a curriculum unit on social-emotional skills. Baseline and post-data comparisons revealed large benefits for teachers who received IYTCM trainings, including a significant increase in the use of positive teaching behaviors and the frequency of promoting children's social and emotional skills. They also significantly decreased in their use of negative teacher behaviors. Students of teachers who received IYTCM trainings exhibited significant increases in levels of appropriate behavior when compared to control students. Furthermore, a majority of IYTCM trained teachers strongly recommended the program. Effect sizes were not reported.

In a similar study, Hutchings and colleagues (2007) examined the effectiveness of IYTCM on preschool teachers and students in Wales. After receiving five days of IYTCM training, 23 teachers completed the Teacher Satisfaction Questionnaire (TSQ) and a semistructured interview. Overall, IYTCM teachers reported high overall confidence in use of strategies that were taught during trainings (a mean score of 4.6 out of 5). Teachers reported the most useful aspect of the program to be the time spent sharing experiences and strategies with

others. Classroom observations revealed that IYTCM trained teachers made significantly greater use of direct commands (d = .94) and allowed students more time to respond to commands before issuing a second command (d = .79) in comparison to control teachers. Students of trained teachers also exhibited significantly more positive behaviors (d = .99) and less noncompliant behaviors (d = 1.13) than students of control teachers.

Carlson, Tiret, Bender and Benson (2011) examined the effectiveness of IYTCM group training of 24 preschool teachers; trainings were spread across eight sessions for a total of 32 hours. Teacher beliefs regarding their use of classroom management strategies, as well as their beliefs about the usefulness of these strategies, were measured using the TSQ at three time points: pre-training, post-training, and at a follow-up 16 weeks following the completion of the trainings. Researchers found significant differences across time periods (i.e., from pre- to posttraining and pre- to follow-up) for the frequency and perceived usefulness of proactive TCM strategies. Teachers' reports of perceived usefulness of positive and inappropriate classroom management strategies were highly correlated to self-reported use of those strategies. Effect sizes were not reported. These findings further support that group training in IYTCM may be an effective method of dissemination for the IYTCM information and strategies, leading to an increase in teachers' use of positive classroom strategies and improved perceptions of the usefulness of those strategies.

A national study was conducted to examine three different approaches to the professional development of teachers, with a focus on supporting children's social-emotional development within the Head Start system; the three approaches included the IYTCM program, Preschool Promoting Alternative Thinking Strategies (PATHS) program, and "Tools of the Mind—Play" program (Morris, Mattera, Castells, Bangser, Bierman, & Raver, 2014). Seventeen Head Start

grantees across the country participated in the study, resulting in 307 classrooms and approximately nine children per classroom. Using a matched design, classrooms were assigned to one of the three training groups or to a control group. Independent observations of teaching practices and classroom climate, teacher survey reports on children's learning and social behaviors and independent direct assessments of children's cognitive and social-emotional skills were collected in the spring of the Head Start school year. Results indicated that, in comparison to control group counterparts, teachers who participated in the IYTCM program demonstrated increased use of positive behavior management practices and decreased use of negative behavior management practices. They also demonstrated improvements in their social-emotional instruction. Effect sizes for teacher outcome variables were not reported. Students of IYTCM trained teachers demonstrated small, but statistically significant improvements in their knowledge of emotions (d = .13), social problem-solving skills (d = .14), and social behaviors (d= .28). Additionally, although children of IYTCM trained teachers, as a whole, did not demonstrate a significant decrease in problem behaviors, those students who were rated to have the highest level of behavior problems at the Fall measurement time point did demonstrate a significant improvement at the Spring measurement time point.

Finally, adapted versions of the IYTCM program have also demonstrated positive results (e.g., Raver et al., 2008; Reinke, Herman, Stormont, Newcomer, & David, 2013; Reinke et al., 2014; Shernoff & Kratochwill, 2007; Snyder et al., 2011). For example, Snyder and colleagues (2011) found that an adapted version of the IYTCM program, paired with three on-site classroom consultation sessions which focused on teacher skill application (each approximately 45 minutes in length), resulted in positive outcomes for both teachers and students. Similarly, Raver and colleagues (2008) examined the effects of IYTCM group training paired with weekly onsite

mental health consultation support. They found that teachers in the treatment condition made significant gains, in terms of their classroom management skills, compared to control condition teachers.

Transportability of the IY Series

Although research that specifically examines factors related to the transportability of the IYTCM program to educational contexts is minimal, IYTCM program developers do emphasize the importance of implementation fidelity in the successful transportation of the IYTCM program. To begin, IY series program developers conceptualize implementation fidelity along the following three dimensions: 1) treatment adherence (i.e., delivery of core program content in the recommended sequence, intervention dosage), 2) interventionist competence (i.e., "IY Trainer's skill level of using the training methods, processes, and learning principles employed in the original program model") and 3) treatment differentiation (i.e., adapting the program principles to align with participants' background experiences, culture, education, and values; Webster-Stratton, 2009; Webster-Stratton, Reinke, Herman, & Newcomer, 2011, p. 511). Implementation fidelity is necessary, in order to ensure that the program results in desired outcomes, in that they mirror the positive effects documented in efficacy research (Webster-Stratton et al., 2011).

The standardization of the IY program content, structure, and materials is an important component of treatment adherence (Webster-Stratton, 2009; Webster-Stratton et al., 2012). Core components of program delivery include the delivery of the program topics in order across five to six monthly workshops, the use of core vignettes as indicated by the program's protocol, the use of group teaching and learning methods (e.g., goal setting and monitoring, behavioral practice, principle building, use of self-reflective inventories), and the use of alliance-building

techniques (e.g., collaborative learning, group problem solving, praise and celebration for participants) between program facilitators and participants (Webster-Stratton et al., 2011). Program developers also note that a key part of the transportability of IY is that it is delivered in groups, not only to ensure the program's cost-effectiveness, but to help facilitate cooperative learning amongst participants as well (Webster-Stratton et al., 2012). Unfortunately, the bulk of the currently available effectiveness research has examined adapted versions of the IYTCM program, in which modifications have been made to the IYTCM group training format. For instance, previous research has examined IYTCM group training when delivered across shorter time periods (i.e., ten weeks, three months, five months) compared to what is recommended by program developers (i.e., six months; Carlson et al., 2011; Hutchings et al., 2007; Reinke et al., under-review; Snyder et al., 2011; Webster-Stratton et al., 2011). Additionally, limited research has examined the IYTCM group training as a stand-alone program, independent of additional IY training programs (i.e., IY parent training or child programs), program adaptations (e.g., selfstudy models) or coaching/consultation components (e.g., Raver et al., 2008; Reinke et al., under-review; Webster-Stratton et al., 2004; Webster-Stratton et al., 2008). Therefore, although previous effectiveness research has indicated adapted or modified versions of the IYTCM program to result in positive outcomes, the effectiveness of the standard IYTCM training program within school contexts is largely unknown.

Interventionist's competence is cited as another important method of promoting implementation fidelity. To become a certified trainer in an IY program, clinicians must undergo a multi-step, comprehensive training and certification process under the supervision of certified trainers and mentors who have been selected by the program developer. First, clinicians must attend a 3-day initial core training workshop, in order to learn the foundational therapeutic

processes and principles that are essential to the IY program. Next, clinicians must implement the program with two groups of participants and submit a DVD of their session, along with required paperwork (i.e., session checklists, participant evaluations, self-evaluation, letters of recommendation) to the Incredible Years program developers for review. If a positive review is obtained, certification is granted; program developers indicate that certified trainers are assumed to implement the program with high levels of fidelity and, thus, should expect to achieve program outcomes similar to those in published studies (Webster-Stratton & Herman, 2009).

Finally, Webster-Stratton (2009) argues that the IY series is a "'generic,' but culturally sensitive" EBP, in that the IY programs are based on a set of universal principles, but that these principles can be adapted for their delivery to diverse populations and contexts (p.18). In this argument, Webster-Stratton (2009) acknowledges that implementation fidelity encompasses treatment differentiation, in that the program's principles must be tailored to each participant's unique needs and goals in order for them to be effective. Webster-Stratton and colleagues (2012) suggest that certain adaptions can be made to the IY programs, while still upholding the integrity of the programs' implementation. For example, while it is suggested that program content be delivered across a minimum of five, full-day workshops, increased dosage may be necessary in order to ensure that there is enough time for participants to adequately engage with the material and practice the targeted strategies. Also, in addition to the core vignettes showed during the training sessions, the group leader may select additional vignettes that relate to participants' specific needs or interests (e.g., persistence coaching methods for a child with ADHD; Webster-Stratton et al., 2011). Finally, teaching and learning methods may be adjusted to meet participants' needs. For example, if participants are struggling with a specific strategy, the group leader might increase the number of role-play practices participants engage in. Or, although the

core model of the IYTCM program does not require the provision of between-session coaching supports, the use of coaching supports may be beneficial for challenging situations (e.g., child care settings, Head Start settings, students with severe challenging behaviors).

In sum, although the successful transportation of the IY programs to unique populations and cultures has been documented within the literature (e.g., Baker-Henningham et al., 2009; Hutchings et al., 2007; Reid, Webster-Stratton, & Beauchaine, 2001; Webster-Stratton et al., 2012), additional research is needed to understand the true effectiveness of the IYTCM group training program, when it is implemented as intended by program developers. Only after evaluating the effectiveness of the standard version of the IYTCM program can researchers begin to explore ways in which the program can be adapted to meet the needs of the context, while still maintaining a sufficient amount of implementation fidelity so that outcomes match those documented within the efficacy research. This includes examination of IYTCM group training effects on both teachers' beliefs and behaviors related to classroom management.

The purpose of the current study was to examine the transportability of the IYTCM program, with a focus on how personal implementer characteristics, specifically preschool teachers' attitudes and beliefs (Fixsen et al., 2009), change over the course of treatment and how they relate to teacher implementation outcomes. First, this study examined preschool teachers' response to the IYTCM group training administered across a six-month period, in terms of changes in their perceptions of the IYTCM program strategies' usefulness, their self-reported and observed use of these strategies, their CMSE, and their attitudes towards EBPs. Second, this study examined whether preschool teachers' perceptions of the IYTCM content and CMSE significantly related to changes in teachers' use of classroom management strategies. Finally, this

study examined how preschool teachers' perceptions of barriers to implementing behavioral interventions changed in response to the IYTCM group training.

The IYTCM group training aims to indirectly improve student outcomes by providing direct training support to teachers in classroom management strategies (Webster-Stratton, 2012). Although enhanced student outcomes is the overall goal of the entire IY training series, this study focused specifically on preschool teacher beliefs and behaviors. Based on previous efficacy research, which has examined teacher outcomes in conjunction with child outcomes (Webster-Stratton et al., 2001; Webster-Stratton et al., 2004; Webster-Stratton et al., 2008), the assumption can be made that improved teacher outcomes can, and will, result in improved child outcomes.

Research Questions and Hypotheses

The research questions for this study are as follows:

Question 1a: Do preschool teachers who participate in IYTCM training demonstrate changes in their perceptions of the usefulness of classroom management strategies from pre- to mid- to post-training (i.e., an increase in positive approaches to classroom management and a decrease in negative approaches)? Previous efficacy and effectiveness research on the IYTCM program indicates that teachers' perceptions of the positive classroom management strategies significantly increase following training (Carlson et al., 2011; Webster-Stratton et al., 2001; Webster-Stratton et al., 2004). Therefore, it was hypothesized that participating in the IYTCM trainings will significantly relate to a positive change in their perceptions of the positive IYTCM strategies. However, previous research that examined changes in participants' perceptions of inappropriate classroom management strategies following IYTCM training has not consistently found a significant decline in these ratings; yet, researchers have noted that participants'

usefulness ratings of inappropriate strategies prior to IYTCM training were low, which may account for the lack of statistically significant change from pre- to post-training in these studies (Carlson et al., 2011; Hicks et al., 2015). Therefore, it was hypothesized that participating teachers' usefulness ratings of inappropriate classroom management strategies would decline following IYTCM training, but these changes might not be statistically significant if pre-training ratings were low.

Question 1b: Do preschool teachers who participate in IYTCM training demonstrate increases in their classroom management self-efficacy from pre- to mid- to post-training? Classroom management self-efficacy beliefs are important precursors to educators' successful adoption of new instructional and behavior management strategies (e.g., Andreou & Rapti, 2010; Sy & Glanz, 2008; Tschannen-Moran & McMaster, 2009). Few previous studies have examined classroom management self-efficacy beliefs amongst early childhood educators (Bullock, Coplan, & Bosacki, 2015), or the effects of professional development training on teachers' classroom management self-efficacy beliefs (Ross & Bruce, 2007). However, the available literature does suggest that professional development training results in improved CMSE for educators (e.g., Gaudrea et al., 2013; Gebbie et al., 2012; Ross & Bruce, 2007). Furthermore, previous research on the IYTCM program indicates that practitioners' confidence in managing student behavior problems increases following exposure to the IYTCM content (e.g., Hicks-Hoste et al., 2015; Shernoff & Kratochwill, 2007). Therefore, it was hypothesized that participating in the IYTCM trainings would significantly predict positive changes in preschool teachers' CMSE from pre- to mid- to post-intervention time points.

Question 1c: Do preschool teachers who participate in IYTCM training demonstrate a positive change in their attitudes towards evidence-based practices from pre- to mid- to post-

training? Despite the large political push for the adoption and use of EBPs/EBIs (Owens et al., 2014), there are often low implementation rates, as well as low rates of implementation fidelity, within educational contexts (e.g., Ennett et al., 2003). Furthermore, in a survey of 292 early childhood and elementary school teachers, Reinke and colleagues (2011) report that only 55.5% of surveyed teachers indicated that they were familiar with the term "evidence-based practices." Therefore, practitioners' knowledge of EBPs/EBIs, as well as their attitudes towards EBPs/EBIs, may relate to their adoption and use of them in their everyday practice; this is further supported by previous research, which highlights the important link between teachers' EBP beliefs and implementation behaviors (e.g., Cook et al., 2015). Additionally, previous research has found that, following training in specific EBP methods, individuals' general perceptions of EBPs positively increase (e.g., Bearman et al., 2014; Cook et al., 2015; Lim et al., 2012). Therefore, it was hypothesized that participation in the IYTCM trainings would significantly predict positive changes in preschool teachers' attitudes towards EBPs from pre- to mid- to post-intervention time points.

Question 2a: Do preschool teachers who participate in IYTCM training demonstrate a self-reported increase in their use of positive classroom management strategies, as well as a decrease in negative classroom management strategies from pre- to mid- to post-training? Previous research has examined changes in participants' self-reported use of classroom management strategies following adapted versions of the IYTCM program. After participating in a self-study version of IYTCM, teachers were found to self-report significant increases in their proactive instructional strategies (Shernoff & Kratochwill, 2007). Following adapted IYTCM trainings, participants have also been found to self-report significant increases in their use of positive strategies, including proactive strategies and use of praise and incentives (Carlson et al.,

2011; Hicks et al., 2015). Surprisingly, previous research has not found participants' selfreported use of positive approaches to working with parents and families, nor their self-reported use of inappropriate classroom management strategies, to significantly increase and decrease, respectively, following IYTCM training (Carlson et al., 2011; Hicks et al., 2015). However, when interpreting these findings, it is important to note the factors that may have influenced outcomes in unexpected ways, such as that these studies examined adapted versions of the IYTCM program (i.e., self-administered and modified group training formats). Additionally, Hicks and colleagues (2015) examined the effects of the IYTCM program on a sample of afterschool care providers, whose roles and responsibilities may have limited their ability to alter their use of classroom management strategies taught by the IYTCM program. Despite these findings, the strong research base on the efficacy of the IYTCM training, in terms of positive changes in teachers' classroom management behaviors (e.g., Webster-Stratton et al., 2011), yields support for the hypothesis that participation in the IYTCM training across a six-month period would significantly predict changes in the desired direction, in terms of teachers' selfreported increases in their use of positive classroom management strategies and decreases in their use of negative classroom management strategies, respectively.

Question 2b: Do preschool teachers who participate in IYTCM training demonstrate an observed increase in their use of effective classroom management strategies (i.e., specific praise, explicit reprimand) and an observed decrease in their use of ineffective or negative classroom management strategies (i.e., general praise, harsh reprimand) from pre-, to mid-, to posttraining? Research on the IYTCM program indicates that group-based training results in observed increases in teachers' use of positive classroom management strategies and decreases in teachers' use of negative classroom management strategies when compared to control group

teachers (Hutchings et al., 2007; Webster-Stratton, et al., 2008). Using the Brief Classroom Interaction Observation-Revised to assess teachers' use of specific praise, general praise, and reprimands, Reinke and colleagues (2013) found that teachers demonstrated improvements in skill implementation following a variation of the IYTCM group training. Therefore, it was hypothesized that participation in the IYTCM training would significantly predict changes in participating teachers' use of positive and negative classroom management strategies, in the desired direction.

Question 3: How do changes in participants' beliefs relate to changes in their observed use of classroom management strategies? Not only do practitioners' attitudes change over time due to their experiences (e.g., Rydell & McConnell, 2006), practitioners' beliefs and perceptions regarding interventions significantly affect their willingness and ability to implement them (e.g. Durlak & DuPre, 2008; Forman et al., 2009). Hence, it was hypothesized that pre-, to mid-, to post-training changes in participating teachers' perceptions of the usefulness of the IYTCM strategies and their self-efficacy in classroom management would relate to pre-, to mid-, to posttraining changes in teachers' use of classroom management strategies.

It was hypothesized that increases in participating teachers' perceptions of the usefulness of positive strategies would relate to their increased use of positive classroom management strategies and decreased use of negative classroom management strategies. In previous efficacy research, increased use of positive classroom management strategies has been found in the presence of teachers' high ratings of the usefulness of the IYTCM program and strategies (e.g., Webster-Stratton et al., 2001; Webster-Stratton et al., 2004).

Additionally, previous literature suggests that teachers' self-efficacy beliefs are related to teacher behavior (Klassen, Tze, Betts, & Gordon, 2011). Furthermore, previous research

indicates that both teachers' CMSE, as well as their utilization of effective classroom management strategies, increases, in response to professional development training (e.g., Gaudrea et al., 2013; Hutchings et al., 2007; Reinke et al., 2013; Ross & Bruce, 2007; Webster-Stratton et al., 2008). Limited research has examined CMSE in conjunction with teachers' use of specific behavior management strategies. However, based on the available literature, it was hypothesized that participating teachers who reported an increase in CMSE would demonstrate an increased use of positive classroom management strategies and a decreased use of negative classroom management strategies via classroom observation data collection.

Question 4: Across pre-, mid-, and post-intervention time points, what do participating preschool teachers report to be the most serious and least serious barriers to their implementation of EBIs in their classrooms? How does participating in the IYTCM training relate to changes in participants' perceptions of EBI implementation barriers pre- to mid- to post-training?

Previous research suggests that a lack of time, resources, and funding, as well as insufficient staff training and coaching, serve as significant barriers to school professionals' implementation of evidence-based behavioral intervention strategies (Hicks et al., 2014; McGoey et al., 2014; Reinke et al., 2011). Teachers, in particular, have indicated a number of factors to serve as serious barriers to their implementation of behavior interventions and supports in their classrooms, including but not limited to: the severity of the behavior problem, a lack of time to analyze behaviors, class size, and a lack of time to implement interventions (McGoey et al., 2014). This research question was primarily exploratory in nature. However, it was expected that participating preschool teachers' responses would be similar to those noted in previous

research, such as that lack of resources (i.e., time, coaching supports) would be rated as serious barriers.

Additionally, school-based practitioners' level and quality of training in behavioral EBIs significantly relates to their perceptions of implementation barriers, in that individuals who receive less training, or less quality training, rate a higher number of factors to serve as serious barriers to their use of EBIs (Hicks et al., 2014). In their examination of the barriers teachers reported encountering when learning and implementing the IYTCM strategies, Shernoff and Kratochwill (2007) found that teachers most frequently cited lack of time, co-teachers' lack of exposure to the IYTCM program, and a perceived mismatch between their schools' philosophies regarding classroom management and the IYTCM program's philosophies. Given the lack of previous research on the ways in which IYTCM training potentially mollifies practitioners' perceptions of implementation barriers, this research question was primarily exploratory. However, IYTCM trained teachers will likely have additional knowledge and skills in how to circumvent certain implementation barriers in their classrooms. Thus, it was hypothesized that participating in the IYTCM trainings would significantly relate to a decrease in preschool teachers overall rating of implementation barriers from the pre- to mid- to post-intervention period.

CHAPTER 3

METHODS

Design

Participating teachers received the IYTCM group training intervention. The study used a pre-, mid- and post-intervention design, in which data was collected through teacher rating scales and direct classroom observations of teachers' classroom management strategies in order to measure whether there were changes in the dependent variables. This study examined changes in teachers' perceptions, attitudes, and behaviors across approximately a ten-month period from the pre-intervention data collection period at the beginning of the school year (i.e., November to December) to the post-intervention data collection period at the end of the school year (i.e., May to June). The intervention phase was conducted over a six-month period (i.e., January through June). This timeline for data collection and intervention implementation is consistent with the format recommended by the program developers (Webster-Stratton, 2012) and aligns with previously conducted efficacy research on the IYTCM program (Webster-Stratton et al., 2004; Webster-Stratton et al., 2008). This study's intervention phase (i.e., January through June) differs from previously conducted effectiveness research, in which the intervention phase has been implemented across approximately ten week (Carlson et al., 2011), three month (Snyder et al, 2011), and five month (Hutchings et al., 2007) time periods. In comparison to previous effectiveness research, the implemented timeline extended the amount of time allotted to each training component of the IYTCM program, thus allowing more opportunities for participants to practice IYTCM strategies in-between group training sessions and across the intervention period. Tables 1 and 2 provide a visual display of the study's research questions, measures, data analyses, and sequence of data collection procedures.

Question	Measures and Constructs	Treatment Phase	Scores Used	Data Analysis
Question 1a : Do preschool teachers who participate in the IYTCM group training demonstrate changes in their perceptions of the usefulness of classroom management strategies from pre- to mid- to post-training (i.e., an increase in positive approaches and a decrease in negative approaches)?	Teacher Strategies Questionnaire (TSQ) (Total Positive Strategy Perceptions of Usefulness Score, Inappropriate Strategies Perceptions of Usefulness Score)	Pre-, Mid-, Post- Intervention	Subscale Scores	Linear Mixed Model

 Table 1 Research Questions, Assessment Procedures, and Data Analyses

Table 1 (cont'd)				
Question 1b: Do preschool teachers who participate in the IYTCM group training demonstrate increases in their classroom management self-efficacy from pre- to mid- to post-training?	Teacher Self-Efficacy Scale (Efficacy in Classroom Management)	Pre-, Mid-, Post- intervention	Subscale score	Linear Mixed Model
Question 1c: Do preschool teachers who participate in the IYTCM group training demonstrate a positive change in their attitudes towards evidence-based practices from pre- to mid- to post-training?	Evidence-Based Practice Attitudes Scale (EBPAS)	Pre-, Mid-, Post- intervention	Total Composite Score	Linear Mixed Model
Question 2a: Do preschool teachers who participate in the IYTCM group training demonstrate a self-reported increase in their use of positive classroom management strategies, as well as a decrease in negative classroom management strategies from pre- to mid- to post-training?	Teacher Strategies Questionnaire (TSQ) (Total Positive Strategy Frequency of Use Score, Inappropriate Strategies Frequency of Use Score, Positive Approaches to Working with Parents Frequency of Use Score)	Pre-, Mid-, Post- intervention	Subscale scores	Linear Mixed Model

	Table 1	(cont'd)
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	Brief Classroom Interaction	Pre-, Mid-, Post-	Frequency count of	Generalized Linear
Question 2b: Do preschool	Observation-Revised	intervention	strategy use	Mixed Models
teachers who participate in	(BCIO-R)			
the IYICM group training	(Specific Praise, General			
demonstrate an observed	Praise, Explicit Reprimand,			
increase in their use of	Harsh Reprimand)			
effective classroom				
management strategies (i.e.,				
specific praise, explicit				
reprimand) and an observed				
decrease in their use of				
ineffective or negative				
classroom management				
strategies (i.e., general				
praise, harsh reprimand)				
from pre-, to mid-, to post-				
training?				
Question 3: How do	Teacher Strategies	Pre-, Mid-, Post-	Subscale score	Generalized Linear
changes in preschool	Questionnaire	intervention		Mixed Models
teachers' beliefs relate to	(TSQ)			
changes in their observed	(Total Positive Strategy			
use of classroom	Perceptions of Usefulness			
management strategies?	Score)	Pre-, Mid-, Post-	Subscale score	
		intervention		
	I eacher Self-Efficacy Scale			
	(Efficacy in Classroom			
	Management)			
	Brief Classroom Interaction	Pre-, Mid-, Post-	Frequency count of	
	UDServation-Kevised	intervention	strategy use	
	(BUIU-K)			
	1	1	1	

Table 1 (cont'd)

	Barriers to Implementing	Pre-, Mid-, Post-	Mean item scores	Descriptive
Question 4: At the pre-, mid-	Evidence-Based	intervention		Statistics
and post-intervention time	Interventions in the		Mean rating of	
points, what do preschool	Classroom Survey		implementation	Linear Mixed
teachers report to be the	, i		barriers	Models
most serious and least				
serious barriers to their				
implementation of EBIs in				
their classrooms? How does				
participating in the IYTCM				
training relate to changes in				
participants' perceptions of				
EBI implementation barriers				
pre- to mid- to post-training?				

Table 2 Data Collection Timeline

Pre-intervention Phase October—December	Implementation Phase January—June	Post-intervention Phase May—June
 Teacher Strategies Questionnaire (TSQ) Brief Classroom Interaction Observation—Revised (BCIO—R) Evidence-Based Practice Attitude Scale (EBPAS) Barriers to Implementing Evidence- 	 IY TCM Session Fidelity Checklist—following each group training session IYTCM Workshop Measure of Exposure—Group training attendance 	 Teacher Strategies Questionnaire (TSQ) Brief Classroom Interaction Observation—Revised (BCIO—R) Evidence-Based Practice Attitude Scale (EBPAS) Barriers to Implementing Evidence-
 Barriers to Implementing Evidence- Based Interventions in the Classroom Survey Teacher Self-Efficacy Scale— Efficacy in Classroom Management Subscale 	 Mid-Intervention Data Collection May Teacher Strategies Questionnaire (TSQ) Brief Classroom Interaction Observation—Revised (BCIO—R) Evidence-Based Practice Attitude Scale (EBPAS) Barriers to Implementing Evidence- Based Interventions in the Classroom Survey Teacher Self-Efficacy Scale— Efficacy in Classroom Management Subscale 	 Barners to Implementing Evidence- Based Interventions in the Classroom Survey Teacher Self-Efficacy Scale— Efficacy in Classroom Management Subscale Treatment Evaluation Inventory— Short Form (TEI-SF)

Participants

IYTCM program developers recommend that IYTCM training sessions should include approximately 20 individuals in order to foster adequate group discussion (Webster-Stratton, 2012). Initial enrollment in this study included 32 participants; however, prior to the beginning of the intervention period, nine individuals dropped out (attrition rate of 28%). During the intervention period, two participants dropped out (attrition rate of 9%). Following completion of the training, it was determined that four additional participants dropped from the study due to the fact that they had participated in less then a third of the IY training series (i.e., two training sessions). Of the 15 attrition cases, 10 of the individuals had left their place of employment. Thus, the final sample size included 17 preschool teachers. Participants completed more than 50% of the IY training series and they worked in a variety of public and private educational settings. Table 3 includes the descriptive data for the participants within this study, including the total number of preschool teacher participants, the types of educational settings at which the preschool teachers were employed, the mean age of preschool teacher participants, and additional demographic information.

1 2	1		
Variables	Ν	Attrition Cases	
Teachers	17	15	
Teacher Age M (SD)	39.07 (13.07)	31.72 (12.07)	
Gender			
Female	17	15	
Male	0	0	
Preschool Program			
Public	3	1	
Private	14	14	
Childcare Setting	7	13	
Home-based Setting	4	1	
Other (e.g., church-based)	3	0	

Table 3 Descriptive Statistics for Teacher Participants

Despite variation in service settings (i.e., public versus private), in the state of Michigan all early childhood programs must meet the licensing regulations and requirements outlined in the *Early Childhood Standards of Quality for Infant and Toddler Programs* (ECSQ-PK; applicable to programs servicing children ages birth to three-years-old) and *Early Childhood Standards for Quality for Prekindergarten* (ECSQ-PK; applicable to programs servicing children ages four to five-years-old) documents (Michigan State Board of Education, 2005; Michigan State Board of education, 2013). These licensing requirements ensure that all children, from birth to four years of age, have equal access to high-quality early childhood education with regards to their academic, social, emotional, and physical health development. Thus, it can be assumed that all participating preschool teachers were providing early childhood education services aligned with these state practice standards.

Measures

This study's independent variables included: time (conceptualized as the intervention period's pre-, mid-, and post-intervention time points). The dependent variables of this study include the following variables collected repeatedly across time (i.e., pre-training, mid-training, post-training): teachers' perceived usefulness of classroom management strategies, teachers' self-reported and observed use of classroom management strategies, teachers' self-efficacy in classroom management, teachers' self-reported attitudes towards evidence-based practices, and teachers' ratings of implementation barriers. Teachers' acceptability ratings of IYTCM program were assessed at the conclusion if the IYTCM training period. Treatment adherence for the IYTCM group training was assessed through IY Session Fidelity checklists.

Teacher Strategies Questionnaire (TSQ). The Teacher Strategies Questionnaire (TSQ; Webster-Stratton et al., 2001) is a self-report 44-item questionnaire that assesses teachers'

perceptions of the usefulness of the IYTCM strategies, as well as the perceptions of their frequency of use of the IYTCM strategies. The TSQ is composed of seven subscales: (a) confidence in managing classroom behaviors, (b) praise and incentives, (c) proactive strategies, (d) limit-setting strategies, (e) inappropriate strategies, (f) positive approaches with parents, (g) working with parents. The praise and incentives, proactive strategies, and limit-setting strategies subscales create a Total Positive Strategies composite score. The remaining subscales will be examined individually.

The TSQ questionnaire is included in the IYTCM program curriculum and is available on the IY website (http://incredibleyears.com). This measure has only been used in a small number of previous studies (Carlson et al., 2011; Hutchings et al., 2007; Shernoff & Kratochwill, 2007; Williford & Shelton, 2008). The Incredible Years website (see http://www.incredibleyears.com/ Measures/em.asp) reports cronbach alphas that indicate good internal consistency reliability at baseline for the Total Positive Strategies frequency-of-use subscale (.79) and perception-ofusefulness subscale (.70), the Inappropriate Strategies frequency-of-use subscale (.77) and perception-of-usefulness subscale (.82). Carlson and colleagues (2011) also reported good internal consistency at baseline for the Total Positive Strategies frequency-of-use subscale (.80) and perceptions-of-usefulness subscale (.87), and the Inappropriate Strategies perception-of usefulness subscale (.70). They reported good internal consistency for the Positive Approaches with Parents frequency-of-use subscale (.71) and perceptions-of-usefulness subscale (.88), and the Working with Parents frequency-of-use subscale (.82) as well. However, in comparison to the reliability reports provided by program developers, Carlson and colleagues reported considerably weaker internal consistency for the Inappropriate Strategies perception-ofusefulness subscale (.50). Cronbach's alpha coefficients calculated for this study revealed

acceptable internal consistency for the Total Positive Strategies Perceptions of Usefulness subscale (.74), Total Inappropriate Strategies Perception of Usefulness subscale (.75), and the Positive Approaches with Parents Frequency of Use subscale (.79); weaker internal consistency was found for the Total Positive Strategies Frequency of Use subscale (.65), and Total Inappropriate Strategies Frequency of Use subscale (.67).

The usefulness subscale of the TSQ was used to address the research questions 1a and 3. Participants were asked to rate how useful they perceived the listed TCM strategies to be using the following 5-point Likert scale: *1, Rarely/Never; 2, Sometimes; 3, Half the time; 4, Often; 5, Very Often.* The frequency-of-use scale of the TSQ was used to address research question 2a. Participants were asked to estimate how frequently they used the listed TCM strategies using the following 5-point Likert scale: *1, Rarely/Never; 2, Sometimes; 3, Half the time; 4, Often; 5, Very Often.*

Brief Classroom Interaction Observation-Revised (BCIO-R). The Brief Classroom Interaction Observation-Revised (BCIO-R; Reinke, Herman, Stormont, Newcomer, & David; 2013) is an observation coding system that can be used to measure teachers' use of classroom management practices. The BCIO-R measures teachers' behaviors across three domains: instructional management, promoting and responding to appropriate behavior, and responding to inappropriate behavior. More specifically, a frequency count of teachers' use of specific praise, general praise, precorrections, opportunities to respond, explicit reprimands and harsh reprimands are recorded simultaneously during a pre-specified length of time. For this study's purpose, only the following teacher behaviors were examined: specific praise, general praise, explicit reprimand, and harsh reprimand. Table 4 provides the operational definitions for each of the observed behaviors.

Teacher Freq	uency Codes
Specific	Verbal statement or gesture that indicates approval and names a specific
Praise	behavior.
General Praise	Verbal statement or gesture that indicates approval and <i>does not name a specific behavior</i> .
Explicit Reprimand	Verbal comments or gestures by teacher to indicate disapproval of behavior; reprimand is concise (brief) in a normal speaking tone.
Harsh Reprimand	Verbal comments or gestures indicate disapproval of behavior using a voice louder than typical for setting or harsh, critical, or sarcastic tone.

Table 4 Operational Definitions of Direct Observation Variables on the BCIO-R

Reinke and colleagues (2015) reported adequate reliability and validity of the BCIO-R. In a study of 105 teachers and 1,818 kindergarten to third grade students from 105 Midwestern classrooms, observations of teacher and student behaviors were conducted using the BCIO-R at two time points (at the beginning and midpoint of the academic school year). A subset of the observed teachers (n = 52) also received IYTCM group training and additional BCIO-R observations were conducted on these teachers following the IYTCM workshops 1 and 2. Reliability checks were conducted using 29% of the observations for Time 1 and 56% of the observations for Time 2. The mean percentages of agreement of the BCIO-R for Time 1 and Time 2 were 88% and 90%, respectively. The researchers also examined interrater reliability estimates for specific teaching behaviors and reported the following averages for Time 1: 82% for behavior specific praise, 78% for general praise, 85% for explicit reprimands, and 85% for harsh reprimands. For Time 2, they reported the following interrater reliability averages: 91% for behavior specific praise, 86% for general praise, 90% for explicit reprimands, and 50% for harsh reprimands. Regression analyses were also conducted to determine if the IYTCM intervention was associated with changes in teacher behavior at Time 2, when controlling for Time 1 BCIO-R observations. They reported that teachers who had participated in the IYTCM intervention demonstrated increases in their use of specific praise, in comparison to teachers who did not participate in the intervention. This suggests that the BCIO-R is sensitive to intervention effects. Finally, Reinke and colleagues (2015) report that the BCIO-R demonstrated predictive validity to teacher report of classroom management efficacy.

The BCIO-R has also been used in conjunction with the *Multi-Option Observation System for Experimental* Studies (MOOSES; Tapp, 2004) software in an additional study of the IYTCM program. Reinke and colleagues (2013) used the BCIO-R to assess the frequency of teacher use of general praise statements, specific praise statements, and reprimands during 20 minute observations across the IYTCM intervention phase. They conducted reliability checks on 30% of the conducted observations and reported that the mean percentage agreement across raters to be 87%, with a range from 61 to 100%.

Although previous research has used the BCIO-R in conjunction with the *MOOSES* software, the current study used the BCIO-R using the iPad application, *School Psychology Tools*, given that *School Psychology Tools* is more likely to be used by school-based classroom management consultants (e.g., school psychologists, behavior interventionists) due its accessibility and its cost. *School Psychology Tools* is available for Apple devices (i.e., Apple iPhone, iPad) for \$34.99 in comparison to the *MOOSES* software license, which is \$999. Consistent with previous literature (i.e., Reinke et al., 2013), the current study used the BCIO-R to observe the following teacher behaviors: specific praise, general praise, explicit reprimand, and harsh reprimand.

Evidence-Based Practice Attitude Scale—Teacher Version (EBPAS). The Evidence-Based Practice Attitude Scale (EBPAS; Aarons, 2004) is a 15-item survey used to assess teachers' attitudes towards adopting evidence-based practices. Respondents indicate the extent to which they agree with survey items by using the following 5-point Likert scale: 0 *Not at all*, 1 *To a slight extent*, 2 *To a moderate extent*, 3 *To a great extent*, 4 *To a very great extent*. The EBPAS is composed of questions that assess the following: one's willingness to adopt EBPs given their intuitive appeal (i.e., Appeal subscale), one's willingness to adopt new practices if required by an agency, supervisor, or state (i.e., Requirements subscale), one's openness toward new or innovative practices (i.e., Openness subscale), and one's perceptions that EBPs are not clinically useful and are less important than experience (i.e., Divergence subscale). The EBPAS Total score is an indicator of teachers' global attitudes towards the adoption of EBPs.

The EBPAS was originally developed for use amongst behavioral health care providers. In order to make the EBPAS more applicable to educational research, certain terms of the survey were replaced on the teacher version. For example, the term "clients" was replaced with "students." The psychometric properties of the teacher version of the EBPAS have not yet been studied, nor has this version of the survey been previously used in research. Therefore, the following discussion will pertain to the reliability and validity of the original version of the EBPAS, which has been studied within the clinical context.

Items on the EBPAS were initially identified by conducting a review of the literature, consulting with mental health service providers and researchers, and receiving feedback from an expert panel of six mental health services researchers (Aarons, 2004). EBPAS scale development studies conducted by Aarons (2004) and Aarons and colleagues (2007) report the EBPAS to have

moderate to good internal consistent reliability for the total score (Cronbach's α = .77 and .79, respectively).

Aarons and colleagues (2010) conducted additional analyses of the reliability and factor structure of the EBPAS using a national sample of 1,089 mental health service providers. A good internal reliability estimate was reported for the EBPAS total scale (.76). Support for the fourfactor structure of the scale, as well as the scale's reliability and validity, have been provided by independent researchers as well (e.g., Ashcroft, Foster, Lowery, Henggeler, Chapman, & Rowland, 2011; Melas, Zampetakis, Dimopoulou, & Moustakis, 2012). While previous research indicates the EBPAS total scale to have adequate reliability, subscale analysis suggests that the subscale reliabilities range from weak to acceptable; hence, the EBPAS total score was the sole focus of the current study.

Given the lack of reliability research on the teacher version of the EBPAS, the internal reliability for the Total Score was calculated for this study; the cronbach alpha (.79) indicates adequate internal consistency.

Teacher Self-Efficacy Survey (TSES). The Teacher Self-Efficacy Survey (TSES; Tschannen-Moran & Woolfolk, 2001) is a 24-item survey used to assess teacher's efficacy beliefs on three subscales: efficacy in student engagement, efficacy in instructional practices, and classroom management self-efficacy (CMSE). This study used the Efficacy in Classroom Management subscale of the TSES, which consists of 8-items regarding teacher's self-efficacy beliefs related to their skills in classroom management. Example items include: *How much can you do to control disruptive behavior in the classroom* and *How well can you respond to defiant students*? Teachers rate items along a 9-point likert scale, ranging from 1 Nothing to 9 A Great *Deal*. The Efficacy in Classroom Management subscale is reported to have adequate reliability

(.90; Tschannen-Moran & Hoy, 2001). Evidence of construct validity has also been examined, resulting in a reported positive relationship between the TSES and existing measures of teacher efficacy, including the Gibson and Dembo measure of personal and general teaching efficacy (r = .16, p < 0.01; Tschannen-Moran & Hoy, 2001). Although originally developed for, and tested with, elementary-level teachers, this measure has also been validated with early childhood educators; Bullock and colleagues' (2015) principal component analysis of the Efficacy in Classroom Management subscale provided support that all eight items loaded on a single component, with factor loadings ranging from .72 to .85. Furthermore, they report adequate internal consistency (.91). Cronbach alpha calculated for this study revealed acceptable internal consistency (.93).

Barriers to Implementing Evidence-Based Interventions in the Classroom Survey. The Barriers to Implementing Evidence-Based Interventions in the Classroom Survey (McGoey et al., 2014) is a 19-item survey used to assess teachers' perceptions of the barriers they experience when implementing behavioral interventions. Items align with previous research conducted on implementation barriers (e.g., Hicks et al., 2014; Reinke et al., 2011; Shernoff & Kratochwill, 2007) and include factors such as a lack of training, a lack of materials, a lack of time, and external demands. Participants were asked to rate each item on a 7-point scale, ranging from 0 *not a problem* to 7 *extremely serious barrier*. McGoey and colleagues (2014) report this measure to have adequate reliability (.90). The internal reliability of this measure, as calculated for this study, appears to be adequate (.93)

Treatment Evaluation Inventory—Short Form (TEI-SF) The Treatment Evaluation Inventory—Short Form (TEI-SF; Kelley, Heffer, Gresham, & Elliot, 1989) is a 9-item acceptability measure used to assess teachers' acceptance of an intervention based on two

factors: Acceptability and Ethical Issues/Discomfort. On a 5-point Likert scale, ranging from 1, *strongly disagree* to 5, *strongly agree*, participants were asked to rate their feelings of acceptability of the intervention, including the intervention's social appropriateness and effectiveness. The range of possible scores is 9 - 45; higher total scores indicate higher levels of acceptability. The midpoint rating is 27, which developers consider to be the cut-off point for treatment acceptability. Previous research indicates the TEI-SF to be a valid measure with acceptable internal consistency (.85; Kelley et al., 1989). It has been used in previous literature on the transportability of the IYTCM program (Shernoff & Kratochwill, 2007). Participants completed the TEI-SF once, at the post-intervention time point. Two modifications were made to make the measure more appropriate for the current study's purposes: the term "child" was replaced with "student" and the term "treatment" was replaced with "intervention."

IYTCM Treatment Adherence. Given that the TCM trainer has undergone training provided by program developers and received certification in the IYTCM program, the assumption can be made that the program was implemented with fidelity (Webster-Stratton, 2009). The IYTCM Session Fidelity Checklists, which are available as part of the program materials, served as a measure of treatment adherence. The TCM certified trainer completed the fidelity checklist following each of the training sessions; checklists indicated that for the majority of the training sessions, the TCM certified trainer completed 80% or more of the recommended training activities (see Table 5). Furthermore, the TCM certified trainer was observed during two randomly selected training session, by the primary researcher, for additional fidelity checks. These observations indicated 100% agreement with the fidelity checklist submitted by the trainer.

Session #	Number of Core Vignettes Shown	Number of Optional Vignettes Shown	Percentage of recommended activities completed
1	10	18	90%
1	14	17	60%
2	18	21	80%
3*	8	9	80%
4	14	22	100%
5	11	11	90%
6*	11	12	90%

Table 5 IYTCM Training Session Fidelity Checklists

* Session fidelity check conducted by primary researcher indicated 100% agreement with the fidelity checklist submitted by the TCM certified trainer.

Of note, program developers emphasize that the IYTCM program should be flexibly implemented, to ensure that the "content fits the context of [participant] lives" (Webster-Stratton et al., 2011, p.513). Described as a "reciprocal interaction" between IYTCM group leaders and participants, the expectation is that TCM trainers will use the principle-driven framework of the IYTCM program to deliver the IYTCM strategies in a manner that meets participants' needs, including their experiences, backgrounds, and professional goals (Webster-Stratton et al., 2011, p.513). TCM trainers are able to select from a wide variety of potential activities (e.g., vignettes, discussions, role plays, small group activities); there is no requirement, in terms of the number or type of IY activities that should be administered per session. Therefore, this study reports implementation information for the sole purpose of highlighting the number and types of activities that were administered each session, and how this can vary across sessions. For example, Session 1 content was delivered twice due to conflicts in participants' schedules. While the same principles and content were being discussed, the number and type of vignettes shown, as well as the activities completed, varied due to differences in participants' needs, as gauged by the TCM trainer.

IYTCM Workshop Measure of Exposure. To monitor participants' exposure to the IYTCM group training program, teacher attendance was recorded for each of the six full day workshop sessions. Teachers were expected to attend all sessions, to ensure that they received the dosage necessary for teachers to effectively learn the IYTCM content, per program developers' suggestion of 42 total training hours (Reinke et al., 2013; Webster-Stratton et al., 2011). At the start of each workshop, teachers signed an attendance sheet and the IYTCM certified trainer monitored whether participants attended the full session. In instances when participants were unable to attend a training session, they were supplied with the training materials to review independently. Additionally, four, three-hour evening make-up sessions were offered to all participants, for those who were unable to attend a full-day training, as well as for any participants who had additional questions and wanted further clarification and/or support from the trainer. The material that was covered during each make-up session was determined by the needs of the participants who signed up for the session (e.g., a need to review content from a missed training session, a need to clarify content of a session they had previously attended). Table 6 depicts attendance rates per session. See Table 9 in the results section for individual participant attendance rates.

Although the average number of training hours completed by participants (M = 28.33, SE = 12.47) was less then the recommended number of hours proposed by program developers (42 hours), the number of training hours reported in previous literature has ranged from 28 to 36 hours. While adaptations made to the number of training hours have still resulted in positive outcomes in previous studies (e.g., Carlson et al., 2011; Reinke et al., 2013; Snyder et al., 2011),

it is important to note that within the context of the current study, participant rates were particularly low for the second half of the offered trainings (sessions 4-6). While some of the absent participants were able to review sessions 4 through 6 content during the offered make-up sessions, this training format deviates from the recommended full-day, whole-group training format.

Training Session	Ν
Full-day training session offered January through June	
Session #1	9
Session #1	7
Session#2	16
Session #3	18
Session #4	7
Session #5	9
Session #6	11
3-Hour Make-Up Training Session offered during May and June	
Session #1	3
Session #2	3
Session #3	5
Session #4	3
Session #5	1
Session #6	1

Table 6 Attendance per Session

Procedures

Recruitment. The target population of study was western Michigan area early childhood and preschool teachers who work with children between the ages of three to five. Teacher participants were recruited through the dissemination of paper and electronic flyers (Appendix A), personal emails and/or phone calls, and postings on social media. Leaders within the educational community (e.g., principals, preschool program directors), as well as individual teachers, were contacted. Recruitment efforts included contacting over 100 public, private, and charter schools across three western Michigan counties. Interested individuals were provided consent forms (Appendix B) that outlined the purpose of the study and a general overview of the
IYTCM program. Flyers and consent forms also indicated that all participating teachers would receive a monetary incentive (a \$10 gift card) for their participation in data collection procedures and the research study. Furthermore, participating teachers were offered the opportunity to earn 33 State Continuing Education Clock Hours (SCECHs) for continuing education renewal requirements.

Pre-intervention data collection phase. Similar to efficacy studies conducted by the program developers (Webster-Stratton et al., 2004; Webster-Stratton et al., 2008), data collection commenced approximately two months after the school year had begun, which allowed teachers to get to know their students and establish a routine for their classroom management procedures. Due to initial low enrollment, the enrollment period was extended to a five-month period (August through December). Upon enrollment, teachers were asked to complete: 1) the Teacher Strategies Questionnaire in order to assess their self-reported use and perceptions of usefulness of a variety of classroom management strategies and the strategies they use to engage in partnerships with parents during the pre-intervention phase of the study, 2) the Evidence-Based Practice Attitude Scales (EBPAS) survey, which assessed their attitudes towards adopting evidence-based practices, 3) the Barriers to Implementing EBIs in the Classroom survey, which assessed their perceptions of implementation barriers, and 4) the Efficacy in Classroom Management.

Additionally, observational data of teachers' classroom management behaviors were collected using the BCIO-R observational code. Graduate research assistants conducted a 30-minute baseline observation during instructional periods of teachers. This method is an adaptation from the behavioral observation method that has been used in previous research of the

IYTCM program (i.e., Reinke et al., 2013). Second-year school psychology doctoral students served as research assistants. They underwent training with videotape recordings of teachers of preschool classrooms in order to gain experience in using the BCIO-R observational code and to obtain an acceptable level of reliability. Interrater reliability was calculated using intra-class correlation; intra-class correlation values between .60 and .74 are considered to be good and values between .75 and 1.0 are considered to be excellent (Hallgren, 2012). Table 7 depicts the intra-class correlation coefficients obtained during the training period for the four variables measured on the BCIO-R.

 Table 7 Intra-class Correlation Coefficients for BCIO-R

BCIO-R Variable	Intra-class Correlation
General Praise	.96
Specific Praise	.93
Harsh Reprimand	.83
Explicit Reprimand	.92

As previously indicated, graduate research assistants used the BCIO-R to monitor the frequency of teachers' use of the following behaviors during the observational time periods: general praise statements, specific praise statements, explicit reprimands, and harsh reprimands.

Intervention phase. Following pre-intervention data collection, the IYTCM group training began in January 2016. IYTCM group training was delivered by a certified IY group leader. IYTCM group training was delivered across six full-day workshops (seven hours each; 42 hours total) held on weekends. The training sessions were originally scheduled to occur once per month, as this training format aligns with the recommendations put forth by the program developers (Webster-Stratton, 2012; Webster-Stratton et al., 2011). However, due to logistical barriers (i.e., illness of the trainer, scheduling conflicts of the participants), adjustments were made to the training schedule to accommodate participants and to ensure that the trainings were accessible to all. As a result, Session 1 of the IY training series occurred twice, once in January and once in February. Session 2 occurred in March; Session 3 occurred in April; Sessions 4 and 5 occurred in May; Session 6 occurred in June. Evening make-up sessions (three hours each) were offered twice in May and twice in June (for a total of 12 make-up hours).

The overarching goal of the IYTCM program workshops is to provide teachers with evidence-based classroom management strategies so that they may effectively manage the challenging behaviors of individual students, as well as promote the academic, social, and emotional learning of all students. The IYTCM curriculum is divided into the following six components: 1) building positive relationships with students and the proactive teacher, 2) teacher attention, coaching, encouragement, and praise, 3) motivating students through incentives, 4) decreasing inappropriate behavior—ignoring and redirecting, 5) decreasing inappropriate behavior-follow through with consequences, and 6) emotional regulation, social skills, and problem-solving training (Webster-Stratton, 2011). The group-based nature of the IYTCM program promotes supportive collaboration and problem-solving amongst participating teachers, as well as allows for group discussion and feedback following the presentation of video vignettes and teachers' participation in role-plays and practices (Webster-Stratton et al., 2011). This interactive, collaborative training format helps teachers to learn and adopt the targeted classroom management strategies through modeling and experiential learning.

IYTCM training sessions were led by an IYTCM certified trainer. To obtain certification, leaders must complete an intensive, multistep process that includes attending an IYTCM group leader training led by program developers, conducting two IYTCM workshops, then submitting materials (i.e., a two-hour video of the workshops, participant evaluations, training checklists) to IY program developers for evaluation, feedback, and final certification. The current IYTCM

leader began the certification process in 2009 and became certified in July 2011. The IYTCM trainer had led 12 IYTCM training series (from 2009-2014) prior to the current study. Her educational background includes a Bachelor of Arts degree in Child Development and a Master of Arts degree in Guidance and Development. She has over 25 years of experience in early childhood education as a preschool teacher, family childcare provider, Montessori infant and toddler teacher, and preschool director. She currently works as a Michigan State University Extension Educator, and specializes in the areas of extension health research and social-emotional health. Her role includes providing workshops and trainings at research conferences, as well as to parents and educators within the community.

IY program developers strongly encourage that group leaders acquire certification prior to conducting group trainings to ensure that they possess the level of skill and competence needed to implement the training methods, processes, and learning principles with fidelity (Webster-Stratton, et al., 2011). While the IYTCM program is meant to be a flexible curriculum that can be adapted to meet contextual and participant needs, certified group leaders are trained to "incorporate the core components of the intervention with responsive strategies targeting the identified needs of the teachers and the individual students in the classroom," thus maintaining fidelity within flexible implementation (Webster-Stratton et al., 2011, p.513).

Mid-intervention data collection phase. Following the third training session, teachers were again asked to complete the TSQ, EBPAS, the Barriers to Implementing EBIs in the Classroom survey, and the Efficacy in Classroom Management subscale of the TSES. A single 30-minute observation of teachers' classroom management behaviors during instructional periods using the BCIO-R observational code was conducted by research assistants.

Post-intervention phase. Following the final IYTCM group training session, postintervention data was collected in the same manner it was collected at the pre- and midintervention time points. Teachers were asked to complete the TSQ, EBPAS, Barriers to Implementing EBIs in the Classroom, and the Efficacy in Classroom Management subscale of the TSES. Additionally, 30-minute observations of teachers' classroom management behaviors using the BCIO-R observation coding system were conducted by research assistants. Finally, participating teachers were asked to complete the TEI-SF, as a measure of their acceptability of the IYTCM group training.

Data Analysis

The Statistical Package for Social Sciences (SPSS version 24) and R, a free statistical computing software, were used for the following analyses. Research questions 1a-c, 2a, and 4 asked whether teachers' participation in IYTCM across the intervention period resulted in changes in the following: participants perceptions of the usefulness of classroom management strategies, perceptions of self-efficacy in classroom management, teachers' self-reported use of classroom management strategies, perceptions of implementation barriers, and perceptions of evidence-based practices. Each research question examined whether time significantly predicted change in each aforementioned dependent variable. In this study, measurement time point (referred to hereon out as Time) served as a repeated measures within-subject factor (i.e., pre-, mid-, and post-intervention time points, coded as 0, 1, and 2).

Linear mixed models to address questions 1a-c, 2a, 4. Linear mixed modeling (LMM) is appropriate for repeated measure design, or those that examine within-subject differences across time (Arnau, Bono, Blanca, & Bendayan, 2012; Raudenbusch & Bryk, 2002). Linear mixed modeling is more appropriate then repeated-measures ANOVA models given the nature of

this study's data set; LMMs can be used in studies of small sample sizes and LMM software procedures allow for missing data points, whereas ANOVA models require complete-case analysis (West, Welch, & Gatecki, 2015). Thus, a series of individual LMM analyses were conducted for each dependent variable in research questions 1a-c, 2a, and 4.

Application of LMM assumes a two-level model. At the first level, repeated measures are nested within individual subjects and the following equation is fitted to describe individual linear growth over time:

$$Y_{ti} = \beta_{oi} + \beta_{1i}T_{1i} + \varepsilon_{ti}$$

 Y_{ti} represents the measurement of the dependent variable for subject *i* at time *t*; β_{oi} represents the intercept; β_{1i} represents the slope of the independent variable at time *t* (i.e., the growth trajectory of the subject); *T* represents the independent variable (i.e., time point); ε_{ti} represents the random error term (Raudenbush & Bryk, 2002).

At the second-level, between-subject modeling assumes individual growth parameters $(\beta_{pi}T)$ to be random dependent variables. Between-subject variation in these parameters is modeled as a function of population averages. The following equation represents the level-2 model:

$$Q_p$$

$$\beta_{pi} = \gamma_{po} + \sum_{q=l} \beta_{pq} Z_{qi} + \mu_{pi}$$

Where γ_{po} represents the average intercept of the subjects; Z_{qi} the independent variable; β_{pq} represents the effect of Z_{qi} on the growth variable p; μ_{pi} represents the random error term (Raudenbush & Bryk, 2002).

In a simplified form, the random-intercept LMM models used to address research questions 1a-c, 2a, and 4 can be expressed as:

$\mu_{ij} = \beta_0 + \beta_1 t_{ij} + u_j + \varepsilon_y$

Where μ_{ij} represents the expected population mean score at time *j*; β_0 represents the intercept; β_1 represents the slope of the independent variable; t_{ij} represents the independent variable (i.e., time); u_j represents the variance associated with the intercept; ε represents the residual.

For each LMM model that was conducted, Restricted Maximum Likelihood Estimation (REML Estimation) methods were used. Maximum likelihood methods are used in LMMs to estimate covariance parameters. REML is an alternative, preferred method compared to Maximum Likelihood (ML) estimation within LMMs, given that REML estimation "produce unbiased estimates of covariance parameters by taking into account the loss of degrees of freedom that results from estimating the fixed effects in β " (West et al., 2015, p.28).

As previously stated, separate models were conducted to assess changes across training sessions for each dependent variable for research questions 1a-c, 2a, and 4. In instances when multiple models were conducted to address a single research question, false discovery rate (FDR; Benjamini & Hochberg, 1995; Benjamini & Hochberg, 2000) methods were used to control for Type I error. When conducting multiple comparisons, FDR-controlling procedures help to account for false discoveries (i.e., incorrect rejection of the null hypothesis); FDR procedures are less stringent then family-wise error rate procedures.

One caveat to LMMs is the assumption that variables are distributed independently and normally with a constant variance (West et al., 2015). In this study, normality assumptions were examined using visual inspections of histograms, boxplots, and Q-Q plots, as well as examination of Komogorov-Smirnov test of normality and whether kurtosis and skewness levels fell within the acceptable range (-2 to +2).

Generalized linear mixed models to address questions 2b and 3. In instances in which variables fail to meet normality assumptions, use of Generalized Linear Mixed Models (GLMMs) are more appropriate given that they allow for the analysis of non-normal distributions (Hedeker, 2005). Non-normal distributions are quite common when conducting applied research within the behavioral sciences (Arnau et al., 2012). GLMMs are also most appropriate for count data, given that count data is likely to have non-normal distributions within applied settings (Hedeker, 2005; Raudenbush & Bryk, 2002). Furthermore, when event rates are low and there are many zero values (e.g., the teacher occurred in low rates, or did not engage at all, in the target behavior), use of GLMM with a Poisson distribution is assumed over attempting to inaccurately transform the data (Hedeker, 2005; Raudenbush & Bryk, 2002). A Poisson distribution depicts the probability that an event will occur during a fixed interval of time; within this distribution, the variance is assumed to equal the mean (Raudenbush & Bryk, 2002). The current study is one of applied research and it also examined frequency counts of teachers' use of the following classroom management strategies: general praise, specific praise, harsh reprimand, explicit reprimand.

Research question 2b examined whether teachers' observed use of four types of classroom management strategies significantly changed from pre-, to mid-, to post-intervention time points. Four separate GLMM analyses were run to examine whether time significantly predicted change in each of these dependent variables, respectively. The following equation was used to examine individual linear growth over time:

$\log_{e}[\mu_{ij}] = \beta_{1} + \beta_{2}t_{ij}$

Within the above equation, $g(\mu_{ij}) = \log_e[\mu_{ij}]$. The link function allows the model to assume a Poisson distribution, which is most appropriate for the non-normal count data. Thus, $\log_e[\mu_{ij}]$ represents the predicted outcome of the dependent variable (i.e., population average of count

data); β_1 represents the intercept,; β_2 represents the linear slope of the independent variable (i.e., linear increase in the log means for a one-unit time increase), *t* represents the independent variable (i.e., time). Given that the estimated coefficients within the model are calculated using log transformations, significant fitted model will be transformed back to the original count scale; the inverse transformation of the natural logarithm is the anti-log, represented by the following: $exp[log(\mu)] = \mu = e^{log(\mu)}$.

Research question 3 examined whether changes in teachers' beliefs (as measured by the TSQ Usefulness subscale and Efficacy in Classroom Management subscale of the TSES) related to observed changes in their classroom management strategy use, as measured by the BCIO-R. GLMM methods were used to describe linear changes in dependent variables (i.e., use of general praise, specific praise, explicit reprimand, harsh reprimand) from pre- to mid- to post-intervention time points, and the impact of the independent variables (i.e., perceptions of classroom management strategy usefulness, self-efficacy in classroom management) on behavior changes. Again, GLMM methods were selected over LMM methods to address this research question given the non-normal distribution of the observational count data. Within this population average model, linear slopes describe the rate of change in the dependent variables over the six-month period.

The following model was used for each respective GLMM analysis:

$$\log_{e}[\mu_{ij}] = \beta_{1} + \beta_{2}t_{ij} + \beta_{3}g_{ij} + \beta_{4}g_{i}t_{ij}$$

Within the above equation, $g(\mu_{ij}) = \log_e[\mu_{ij}]$. The link function allows the model to assume a Poisson distribution, which is most appropriate for non-normal count data. Thus, $\log_e[\mu_{ij}]$ represents the predicted outcome of the dependent variable (i.e., population average of count), β_1 represents the intercept, β_{2-4} represent slope estimates (i.e., linear increase in the log means for a

one-unit time increase), t represents the first independent variable (i.e., time), g represents the second independent variable (i.e., perceptions of classroom management strategy usefulness or self-efficacy in classroom management), and the interaction between these two independent variables is represented as $g_i t_{ii}$. Two models were conducted, for each independent variable, respectively. Again, FDR procedures were used to correct for Type I error. Of note, when examining changes in the independent variables (i.e., teachers' self-efficacy and perceptions of positive classroom management strategies on the TSQ) in relation to behavioral change, the TSES and TSQ scores were centered using grand mean centering procedures (West et al., 2015). More specifically, the mean value of the TSES and TSQ Perceptions of Positive Strategy Usefulness subscale was subtracted from each participants' observed TSES or TSQ score, respectively, at each time point. Grand mean centering was used so that the intercept would represent the expected value of the outcome variable (i.e., behavior change) at the mean score of the TSQ, rather then the intercept representing the outcome variable with the TSQ subscale score is zero (West et al., 2015). Again, given that the estimated coefficients within the model are calculated using log transformations, the significant models can be transformed back to the original count scale; the inverse transformation of the natural logarithm is the anti-log, represented by the following:

 $\exp[\log(\mu)] = \mu = e^{\log(\mu)}$

For each GLMM that was conducted, models were fit using Adaptive Guass-Hermite quadrature maximum likelihood methods.

Questions 4, which examined participants' pre-, mid- and post-intervention ratings of implementation barriers, were analyzed using descriptive statistics. More specifically, mean seriousness ratings for each implementation barrier were calculated and reported for pre-, mid-

and post-intervention time points. Additionally, to determine whether changes in participants' ratings of implementation barriers occurred across the intervention period, LMM procedures were used. First, LMM procedures were used to examine whether significant changes in participants overall mean barrier ratings occurred across the pre-, mid-, and post-intervention time points. Second, LMM procedures were used to examine whether significant changes occurred in participants' ratings of the top three rated barriers at the pre-intervention time point; FDR procedures were applied to adjust for Type I error.

Follow-up analyses. As previously noted, participant attendance varied across the training sequence. Hence, exposure to the IYTCM group training, conceptualized as the number of group training hours completed by participants, may be a critical factor to consider in relation to observed changes in the dependent variables. Therefore, follow-up analyses were conducted in order to examine whether the number of group training hours completed by participants at pre-, mid-, and post-intervention time points (referred to henceforth as Training Hours) served as a predicting factor. For questions 1a-c, 2a, and 4, linear mixed modeling methods previously described were used. Time point was not included in the model; rather Training Hours served as the sole fixed effect. In simplified form, the random-intercept LMM used in the post-hoc analyses can be expressed as:

$$Y = \beta_0 + \beta_1 X_1 + \mu_j + \varepsilon_y$$

Where *Y* represents the dependent variable, β_0 represents the intercept, β_1 represents the slope of the independent variable, X_1 represents a time-varying factor (i.e., training hours completed at pre-, mid-, and post-intervention time points); μ_j represents the variance associated with the intercept; ε represents the variance of the level 1 random term. A random intercept model was fitted to allow for the inclusion of a random intercept factor; this represents random deviations

for a given subject from the overall fixed intercept (i.e., assumed differences between subjects at the intercept/pre-intervention time point). FDR methods were again employed to control for Type I error in instances in which multiple models were conducted to address a single research question.

Research question 2b was also re-examined to assess whether teachers' observed use of four types of classroom management strategies significantly changed in relation to the number of hours participants engaged in the IYTCM training. Four separate GLMM analyses were run to examine whether participation in the IYTCM group training (i.e., number of training hours completed) significantly predicted change in each of these dependent variables, respectively. FDR methods were again employed.

Missing data. Given the longitudinal data collection procedure involving survey and observational data at three time points across a ten month period, missing data analyses were taken into consideration prior to conducting data analysis procedures. The percentage of missing data across the study variables ranged from 0% to 23.5%, as depicted in Table 8. When using LMM analysis procedures, it is assumed that missing data is missing at random (MAR) and thus, inferences based on maximum likelihood estimation methods in LMMs can be considered valid (West et al., 2015). The MAR pattern assumes that missing data is an outcome of other external factors (e.g., dropout), rather than assuming that missing data is a result of the *nature* of the data (West et al., 2015). Thus, the assumption of MAR used by LMM analytic procedures allow for greater flexibility, given that subjects being followed over time are not required to have an equal number of measurements.

Variable	N	% missing data			
vallable	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Time 3			
Brief Classroom Interaction Observation-Revised	17	23.5%	6%	29%	
(BCIO-R)					
Teacher Strategy Questionnaire					
Frequency of Positive Strategy Use	17	6%	0%	12%	
Perception of Usefulness of Positive Strategy	17	6%	6%	12%	
Frequency of Negative Strategy Use	17	6%	0%	12%	
Perception of Usefulness of Negative Strategy	17	6%	6%	12%	
Frequency of Working with Parents Strategy Use	17	12%	0%	12%	
Teacher Self-Efficacy Survey (TSES)	17	6%	0%	12%	
Evidence-based Practice Attitude Scale (EBPAS)	17	6%	0%	12%	
Barriers to Implementing Evidence-Based	17	6%	6%	12%	
Interventions in the Classroom Survey					

Table 8 Missing Data per Teacher Variable

CHAPTER 4

RESULTS

This study examined changes in the dependent variables across the intervention period through the examination and comparison of group-level means. However, individual participant changes across dependent variables are also depicted in Tables 9 and 10. Given the study's small sample size, as well as the variation in participants' level of engagement (i.e., number of training hours), examination of individual participant data may be useful in identifying potential intervention effects not detected through group-level analysis.

Table 9	Perception	Variables	bv.	Participant
			/	

Participant # Pre-intervention Mid-intervention Post-intervention	Work Setting	Hours Completed	TSQ-Positive Strategy Usefulness	TSQ-Negative Strategy Usefulness	TSQ-Positive Strategy Use	TSQ-Negative Strategy Use	TSQ-Positive Approaches with Parents Strategy Use	TSES	EBPAS	Barriers to Implementing EBIs	TEI-SF
			71	25	45	23	36	8.75	3.19	4	
1	CC	21	90	45	71	32	31	3.5	2.15	1.53	
			65	18	66	17	41	8.63	2.88	3.94	
2	CC	21	47	9	51	10	38	8.63	1.13	2.53	34
			54	12	56	13	23	7.38	2.31	3.05	
			72	25	73	25	32	8.00	2	5.11	
3	CC	21	92	18	75	14	32	8.25	3.31	3.21	
4	CC	24	60	24	60	19	28	6.63	2.21	3.26	33
			62	18	66	16	35	6.88	2	2.63	
			55	18	68	18	22	8.00	2.42	1.06	
5	CC	27	63	36	68	27	26	8.25	2.17	1.37	38
			57	20	71	20	30	8.00	2.54	1.63	
			47	16	60	15	21	8.13	2.19	1.22	
6	CC	28	33	14	47	16	8	7.75	2.81	1.74	37
			56	18	55	18	16	7.00	1.25	1.26	
			52	15	50	12	35	6.63	2.35	2.33	
7	Н	28	59	15	57	12	34	7.63	1.96	1.89	35
			57	20	54	13	35	6.63	2.21	2.00	
			74	13	53	14	21	5.75	2.75	5.39	
8	Н	30	54	12	54	13	15	7.13	2.69		37
			56	12	58	12	16	5.38	2.71	3.74	
			54	12	57	16	16	613	2.73	2.72	
9	0	35	81	10	64	11	24	7 25	2.75	2.72	43
,	0	55	78	14	63	15	21	7.25	3 20	1 79	Ъ
			, 0	1 r	05	1.0	<u>~</u> 1	1.20	5.29	1.17	

Table 9 (cont'd)

			70	24	70	19	35	8.50	3.25	3.28	
10	Pu	36	72	13	69	11	34	8.75	3.56	1.89	36
			67	12	64	12	34	8.25	2.69	1.79	
			68	14	61	12	32	8.00	3.81	1.89	
11	Ο	41	76	18	70	13	27	8.63	3.88	3.53	43
			85	20	76	12	28	8.63	3.75	3.05	
			55	22	66	18	21	6.00	2.31	2.17	
12	CC	41	50	13	73	17	48	8.13	1.42	4.11	35
			43	14	54	18	17	5.00	2	1.84	
			59	11	63	13	26	8.13	3.75	3.61	
13	0	42	65	12	70	11	23	8.63	3.69	4.89	35
			73	18	75	17	30	8.75	2.25	4.26	
			58	12	54	10	21	6.50	3.00	4.50	
14	Pu	42	69	12	62	13	25	7.13	2.38	4.74	42
			68	14	62	15	21	7.88	2.94	3.95	
			58	12	55	11	19	8.50	2.25	3.89	
15	Pu	42	56	12	43	10	20	7.88	2.38	3.32	44
			71	13	57	11	20	7.50	2.46	3.89	
			43	11	51	18	17	6.00	3.50	3.94	
16	Н	42	57	13	56	15	25	7.5	3.00	3.26	37
			65	15	61	14	26	8.25	3.35	3.16	
			65	14	62	13		5.88	2.75	2.89	
17	Н	42	61	12	56	12	11	7.75	2.63	3.21	40
			49	18	45	11	11	6.63	2.88	1.00	

CC = childcare setting; H = home-based setting; Pu = public school setting; O = other setting (e.g., church-based)

Participant Pre Mid Post	Hours Completed	Praise	Specific Praise	Harsh Reprimand	Explicit Reprimand
1	21	16 44	0 1 	0 1 	11 17
2	21	2 5	2 0	1 0 	2 10
3	21		0	0	0
4	24	1 2	0 5	0 1	3 9
5	27	0	0	2	9
6	28	 0 3	 2 1	 0 0	 3 5
7	28	0 2 5	5 1 2	0 0 0	2 1 1
8	30		 	 	
9	35	24 4 29	2 2 1	$\begin{array}{c} 0\\ 0\\ 2\end{array}$	10 3 0

Table 10 BCIO-R Observation Rates by Participant

Table 10 (cont'd)					
10		0	0	1	4
	36	2	0	0	13
		5	2	0	0
11		24	8	0	4
	41	11	4	0	2
		10	1	0	4
12		21	0	3	12
	41	0	0	2	5
		1	0	0	5
13		2	0	0	8
	42	2	0	0	4
		1	1	0	5
14		0	4	2	1
	42	2	3	0	5
		3	2	0	8
15		1	9	0	7
	42	2	2	0	1
		0	1	0	2
16		0	0	0	6
	42	2	3	0	1
		2	0	0	0
17		25	1	0	3
	42	5	0	0	0
		17	5	0	0

Question 1a

This research question examined whether participating teachers demonstrated changes in their perceptions of the *usefulness* of positive and negative strategies across the pre- mid-, and post-intervention time points. Table 11 depicts descriptive statistics for these teacher variables.

1 0 1	Pre	Mid	Post
Variable			M(SD)
	M (SD)	M (SD)	M (SD)
Teacher Strategy Questionnaire (TSQ)			
Perception-Positive Strategy	60.38 (9.27)	63.82(15.19)	62.73 (11.23)
Perception-Negative Strategy	16.38 (5.06)	16.94 (9.67)	15.87 (3.09)
Frequency-Positive Strategy	59.63 (7.92)	61.53 (9.54)	61.13 (8.45)
Frequency-Negative Strategy	15.88 (4.22)	15.06 (6.04)	14.47 (2.83)
Frequency-Working with Parents	26.33 (8.03)	26.41 (9.81)	24.20 (7.63)
Teacher Self-Efficacy in Classroom Management (TSES)	7.34 (1.15)	7.61 (1.23)	7.29 (1.09)
Evidence-Based Practice Attitude Scale (EBPAS)	2.82 (.56)	2.60 (.76)	2.58 (.63)

Table 11 Descriptive Data for Dependent Variables at Three Time Points

Two separate LMMs were run to examine whether time significantly predicted changes in the TSQ Perceptions of Usefulness subscales (See Table 12). Results indicate that time ($\beta_1 = 2.12, p > .05$) was not a significant predictor of change in the TSQ Perceptions of Positive Strategy Usefulness subscale. Results of the final estimation of variance components are depicted in Table 12. The intraclass correlation for this model was .66, indicating the model accounted for 66% of the variance.

Time was also not a significant predictor of change in the TSQ Perceptions of Negative Strategy Usefulness subscale ($\beta_1 = 0.16, p > .05$). Results of the final estimation of variance components are depicted in Table 12. The intraclass correlation for this model was .47, indicating the model accounted for 47% of the variance.

Fixed Effect	Coefficient	Standard Error	<i>t</i> – ratio	Approx . <i>d.f.</i>	<i>p</i> -value	Corrected <i>p</i> -value
Positive Classroom Management Strategies						
Intercept, β_o	58.64	4.03	14.5	46	.00	
			6			
Time point slope, β_1	2.12	1.61	1.32	30	.20	
Final estimation of variance	e components					
Random Effect	Standard	Variance		χ_2	<i>p</i> -value	
	Deviation	Component				
Intercept	39.23	77.13		1.97	.05	
Level- 1, e	20.27	39.23				
Negative Classroom Manag	gement Strateg	gies				
Intercept, β_o	16.47	2.25	7.32	46	.00	
Time point slope, β_1	0.16	0.91	0.17	29	.86	
Final estimation of variance	e components					
Random Effect	Standard	Variance	χ²	<i>p</i> -		
	Deviation	Component		value		
Intercept	12.21	22.11	1.81	.07		
Level-1, e	6.67	24.93				
* M:						

Table 12 Perceptions of Usefulness of Classroom Management Strategies

*No significant differences

Question 1b

This research question examined whether teachers who participated in the IYTCM group training demonstrated changes in their self-reported self-efficacy in classroom management, as measured by the TSES, from pre-, to mid-, to post-intervention time points. Refer to Table 11 for descriptive statistics on the TSES. A LMM was run to determine if time significantly predicted changes in teachers' self-reported self-efficacy. Results indicate that the time was non-significant ($\beta_1 = -0.02, p > .05$). Results of the final estimation of variance components are depicted in Table 13. The intraclass correlation for this model was .25, indicating that the model accounted for 25% of the variance. When the random intercept term was removed from the model, time was still found to be non-significant ($\beta_1 = -0.02, p > .05$).

Fixed Effect	Coefficient	Standard	t-ratio	Approx.	<i>n</i> -value
	countration	Error	i iulio	<i>d.f.</i>	p varae
Intercept, β_o	7.46	0.41	18.04	44	.00
Time point slope, β_1	-0.02	0.18	-0.12	32	.90
Final Estimation of Variance	Components				
Random Effect	Standard	Variance	χ_{2}	<i>p</i> - v	alue
	Deviation	Component			
Intercept	0.26	0.33	1.27	0.2	21
Level-1, e	0.26	1.01			

Table 13 Self-Efficacy in Classroom Management

*No significant differences

Question 1c

This research question examined whether teachers who participated in the IYTCM group training demonstrated changes in their perceptions of evidence-based practices, as measured by the EBPAS, from pre-, to mid-, to post-intervention time points. Refer to Table 11 for descriptive statistics on the EBPAS. One LMM was run to examine whether time significantly predicted change in the EBPAS. Results indicate that time ($\beta_1 = -0.12, p > .05$) was non-significant. Results of the final estimation of variance components are depicted in Table 14. The intraclass correlation for this model was .45, indicating the model accounted for 45% of the variance.

	=				
Fixed Effect	Coefficient	Standard Error	<i>t</i> –ratio	Approx <i>d.f.</i>	<i>p</i> - value
T ()	2.00	0.01	12.40		00
Intercept, β_o	2.89	0.21	13.49	46	.00
Time point slope, β_1	-0.12	0.87	-1.33	31	.19
Final Estimation of Varian	ce Components	5			
Random Effect	Standard	Variance	χ²	р-	
	Deviation	Component		value	
Intercept	0.10	0.19	1.98	.05	
Level-1, e	0.06	0.23			
4.3.7					

Table 14 Attitudes towards Evidence-Based Practices

*No significant differences

Question 2a

This research question examined whether participation in IYTCM group training resulted in self-reported increases in teachers' use of positive classroom management strategies (as measured by the TSQ Positive Strategy and Working with Parents subscales), as well as selfreported decreases in their use of negative classroom management strategies (as measured by the TSQ Negative Strategy subscale). See Table 11 for descriptive statistics. Three independent LMMs were run to examine whether significant linear changes occurred in these three variables across the intervention period in relation to time. Results indicated that time was not a significant predictor of change in teachers' self-reported use of positive strategies ($\beta_1 = 0.95, p > .05$). Results of the final estimation of variance components are depicted in Table 15. The intraclass correlation for this model was .40, indicating the model accounted for 40% of the variance.

With regards to changes in teachers' self-reported use of negative strategies, time was not a significant predictor ($\beta_1 = -0.37, p > .05$). Results of the final estimation of variance components are depicted in Table 15. The intraclass correlation for this model was .59, indicating the model accounted for 59% of the variance.

Similarly, time ($\beta_1 = -0.58$, p > .05) did not significantly predict changes in teachers' selfreported use of strategies for working with parents. Results of the final estimation of variance components are depicted in Table 15. The intraclass correlation for this model was .51, indicating the model accounted for 51% of the variance.

Fixed Effect	Coefficient	Standard Error	t – ratio	Approx. <i>d.f.</i>	<i>p</i> -value	Corrected <i>p</i> -value
Frequency of Positive Strat	tegy Use					
Intercept, β_o	59.05	2.92	20.20	46	.00	
Time point slope, β_1	0.95	1.22	0.77	31	.45	.62
Final Estimation of Varian	ce Component	S				
Random Effect	Standard	Variance	χ^{2}	<i>p</i> - v	alue	
	Deviation	Component				
Intercept	17.00	30.04	1.77	.()8	
Level-1, e	11.67	45.07				
Frequency of Negative Stra	ategy Use					
Intercept, β_o	16.16	14.84	10.89	44	.00	
Time point slope, β_1	-0.37	0.56	-0.67	30	.51	.62
Final Estimation of Varian	ce Component	S				
Random Effects	Standard	Variance	χ_{2}	<i>p</i> - v	alue	
	Deviation	Component				
Intercept	6.22	13.26	2.13	0.0)3*	
Level-1, e	2.47	9.39				
Frequency of Working with	h Parents Strat	egy Use				
Intercept, β_o	26.91	2.86	9.41	45	.00	
Time point slope, β_1	-0.58	1.13	-0.51	30	.62	.62
Final Estimation of Varian	ce Component	S				
Random Effects	Standard	Variance	χ²	<i>p</i> -	value	
	Deviation	Component				
Intercept	18.95	37.94	2.00).)5	
Level-1, e	9.77	36.90				

Table 15 TSQ Frequency of Use

*significant at the p < 0.05 level

Question 2b

This research question examined whether teachers who participated in the IYTCM group training demonstrated observed changes in their use of four classroom management strategies, as measured by the BCIO-R, from pre-, to mid-, to post-intervention time points. Refer to Table 16 for descriptive statistics on the BICO-R variables.

Tuble To Descriptive Statistics for DCTO-K Observation variables							
Variabla	Pre	Mid	Post				
Variable	M (SD)	M (SD)	M (SD)				
BICO-R							
General Praise	8.92 (11.00)	5.25 (10.68)	6.91 (8.83)				
Specific Praise	2.38 (3.18)	1.44 (1.63)	1.45 (1.37)				
Harsh Reprimand	.54 (.97)	0.38 (.72)	.18 (.60)				
Explicit Reprimand	5.62 (3.69)	5.31 (4.92)	2.73 (2.80)				
Explicit Reprimand	5.62 (3.69)	5.31 (4.92)	2.73 (2.80)				

Table 16 Descriptive Statistics for BCIO-R Observation Variables

Given the nature of the dependent variables (i.e., count data), four individual Poisson GLMMs were used to assess change in the dependent variables, in relation to time. Model over-dispersion was detected; this occurs when the variance exceeds the mean, thus violating the assumption of the Poisson distribution that the variance is equal to the mean. Therefore, negative binomial regression analyses were used, in order to account for the over-dispersed count data. Of note, the negative binomial regression is a generalization of the Poisson regression, as it has the same mean structure but its variance is a function of its mean and it includes an additional dispersion parameter (k). As a result, the variance of the outcome variable can be defined as:

 $var(Y) = \mu + \mu^2/k$

Results of the negative binomial regression analyses indicate that no significant changes occurred in the BCIO-R variables across the intervention period: general praise ($\beta_1 = -0.14, p > .05$), specific praise ($\beta_1 = -0.26, p > .05$), explicit reprimand ($\beta_1 = -0.34, p > .05$), harsh reprimand ($\beta_1 = -0.51, p > .05$; see Table 17 for results).

Fixed Effect	Coeff icient	Standard Error	z-value	<i>p</i> -value	Corrected <i>p</i> -value
General Praise					1
Intercept, β_o	2.20	.60	3.63	.00	
Time point slope, β_1	-0.14	.29	-0.49	.63	.63
Specific Praise					
Intercept, β_o	1.05	.53	2.00	.05	
Time point slope, β_l	-0.26	.26	-1.03	.31	.41
Explicit Reprimand					
Intercept, β_o	2.17	.37	5.82	.00	
Time point slope, β_I	-0.34	0.18	-1.84	.07	.28
Harsh Reprimand					
Intercept, β_o	-0.06	.91	-0.06	.95	
Time point slope, β_1	-0.51	0.47	-1.09	.28	.41
* M:					

Table 17 Results of GLMMs for BCIO-R Variables

*No significant differences

Question 3

This research question examined whether changes in teachers' beliefs, as measured by the TSQ Perceptions of Positive Strategy Usefulness subscale and the TSES, independently related to changes in teachers' observed use of classroom management strategies. Again, given the non-normality of the BCIO-R variables, eight independent Poisson GLMMs were run. Model diagnostics revealed over-dispersion in the models, thus negative binomial regression analyses were used and FDR procedures were applied to account for Type I errors. Results indicated that changes in teachers' self-efficacy (as measured by the TSES) did not significantly relate to changes in their observed use of general praise ($\beta_3 = -0.41$, p > .05), specific praise ($\beta_3 = -0.22$, p> .05), explicit reprimand statements ($\beta_3 = -0.02$, p > .05), or harsh reprimand statements (β_3 = 0.07, p > .05; see Table 18 for results).

Changes in teachers' perceptions of the usefulness of positive classroom management strategies (as measured by the TSQ Positive Strategy Usefulness subscale) did not significantly relate to changes in their observed use of general praise ($\beta_3 = -0.02$, p > .05), specific praise (β_3

=-0.01, p > .05), explicit reprimand ($\beta_3 = 0.00, p > .05$), or harsh reprimand ($\beta_3 = 0.05, p > .05$;

see Table 19 for results).

Tuble 10 Relation of 1920 to Delo R Farables							
Fixed Effect	Coefficient	Standard Error	z-value	<i>p</i> -value	Corrected <i>p</i> -value		
General Praise							
Time*TSES slope, β_3	-0.41	.51	-0.80	.42	.95		
Specific Praise							
Time*TSES slope, β_3	-0.22	.22	-1.00	.32	.84		
Explicit Reprimand							
Time*TSES slope, β_3	-0.02	.17	-0.14	.89	.95		
Harsh Reprimand							
Time*TSES slope, β_3	0.07	.40	0.18	.86	.95		
*No significant differences							

Table 18 Relation of TSES to BCIO-R Variables

Table 19 Relation of TSQ Positive Strategy Usefulness to BCIO-R Variables

Fixed Effect	Coefficient	Standard Error	z-value	<i>p</i> -value	Corrected <i>p</i> -value
General Praise					
Time*TSQ slope, β_3	-0.02	.03	-0.69	.49	.74
Specific Praise					
Time*TSQ slope, β_3	-0.01	.03	-0.50	.62	.83
Explicit Reprimand					
Time*TSQ slope, β_3	0.00	.02	-0.03	.97	.97
Harsh Reprimand					
Time*TSQslope, β_3	0.05	.05	1.14	.25	.60

*No significant differences

Question 4

This research question explored the types of implementation barriers teachers reported as most serious and least serious at pre-, mid- and post-intervention time points, with regard to successfully adopting and implementing EBIs in their classrooms. See Table 20 for descriptive statistics on each surveyed implementation barrier.

Item	Pre M(SD)	Mid M (SD)	Post M (SD)
Lack of administrative support	2.38 (1.67)	2.19 (1.87)	2.67 (1.84)
Lack of time to create interventions	3.25 (1.91)	3.31 (1.86)	3.40 (2.03)
Lack of time to investigate interventions	3.38 (1.78)	3.25 (1.81)	3.47 (1.27)
Lack of training on interventions	3.94 (1.65)	3.13 (1.86)	2.73 (1.58)*
Ineffectiveness of previous interventions	3.19 (1.87)	2.69 (1.54)	2.00 (1.13)
Lack of materials	3.06 (1.88)	2.50 (1.67)	2.00 (1.25)
Lack of time to implement interventions	3.56 (1.75)	2.81 (1.33)	2.40 (1.18)
Demand to perform nonteaching duties	3.5 (1.86)	2.81 (1.91)	2.93 (1.53)
Lack of communication with parents	2.94 (2.05)	2.31 (1.35)	2.47 (1.55)
Lack of training on children with problems	4.00 (1.75)	3.50 (2.31)	2.80 (1.42)*
Comfort in working with children with special needs	3 (1.55)	3.31 (2.02)	2.67 (1.36)
Lack of support from school psychologist	3.67 (2.41)	3.31 (2.18)	2.73 (2.02)
Think intervention will not work	2.56 (1.97)	2.44 (1.21)	1.73 (1.39)
Lack of time to analyze behaviors	3.25 (1.61)	3.25 (1.61)	2.93 (1.39)
Severity of problem	3.19 (1.72)	3.50 (2.00)	2.67 (1.45)
Lack of training in research procedures	3.69 (1.58)	3.63 (1.71)	2.33 (1.23)*
Lack of training in reading research	3.5 (1.75)	2.94 (1.48)	2.33 (1.23)
Inability of students to benefit from regular instruction	2.63 (1.54)	2.38 (1.45)	2.40 (1.59)
Class Size	2.81 (1.87)	2.19 (1.72)	2.40 (1.59)
Average Barrier Score	3.25 (1.29)	2.92 (1.10)	2.60 (1.06)*

Table 20 Descriptive Statistics of Implementation Barriers

* significant at the p < 0.05 level

Results indicate that, at the pre-intervention time point, teachers rated the most significant barriers to be: lack of training on children with problems (M = 4.00, SD = 1.75), lack of training on interventions (M = 3.94, SD = 1.65), and lack of training in research procedures (M = 3.69, SD = 1.58). The least serious implementation barriers were rated to be: lack of administrative support (M = 2.38, SD = 1.67), teachers' perception that the intervention will not work (M =2.56, SD = 1.97), and the belief that students are not able to benefit from regular instruction (M =2.63, SD = 1.54).

At the mid-intervention time point, the most serious implementation barriers were rated to be: lack of training in research procedures (M = 3.63, SD = 1.71), severity of problem (M = 3.50, SD = 2.00), and lack of training on children with problems (M = 3.50, SD = 2.31). The least serious implementation barriers were rated to be: class size (M = 2.19, SD = 1.72), lack of administrative support (M = 2.19, SD = 1.87), and lack of communication with parents (M = 2.31, SD = 1.35).

At the post-intervention time point, the most serious implementation barriers were rated to be: lack of time to investigate interventions (M = 3.47; SD = 1.27), lack of time to create interventions (M = 3.40, SD = 2.03), lack of time to analyze behaviors (M = 2.93, SD = 1.39), and demand to perform nonteaching duties (M = 2.93, SD = 1.53). The least serious barriers were rated to be: think intervention will not work (M = 1.73, SD = 1.39), ineffectiveness of previous intervention (M = 2.00, SD = 1.13), and lack of materials (M = 2.00, SD = 1.25).

The second part of research question 4 examined whether participation in the IYTCM training related to changes in teachers' mean ratings of implementation barriers, as well as the three barriers rated to be most serious at the pre-intervention time point. See Table 20 for the mean ratings of the overall barrier scores across pre, mid, and post-intervention time points. A LMM was run to examine whether time significantly predicted changes in teachers' overall mean barrier ratings. Results indicate that time was a significant predictor ($\beta_l = -0.31$, p < .05). Results of the final estimation of variance components are depicted in Table 21. The intraclass correlation for this model was .58, indicating the conditional model accounted for 58% of the variance. To assess the fit of the model, a Q-Q plot of the conditional residuals, as well as a scatter plot of the conditional residuals versus the conditional predicted values, were examined. Visual inspection of the data did not indicate the presence of outliers, or abnormality in the data. Furthermore, the Shapiro-Wilk test for normality was not significant (p = .89), thus the null hypothesis (i.e., normality of the residuals) was maintained.

Fixed Effect	Coefficient	Standard Error	<i>t</i> –ratio	Approx. <i>d.f.</i>	<i>p</i> -value
Intercept, β_o	3.56	0.36	9.96	43	.00
Time slope, β_1	-0.31	0.14	-2.26	30	0.03*
Final Estimation of Var	iance Compone	ents			
Random Effects	Standard	Variance	χ_2	<i>p</i> - value	
	Deviation	Component			
Intercept	0.35	0.77	2.21	.03*	
Level-1, e	0.14	0.55			

Table 21 Barriers to Implementation of EBPs/EBIs

*significant at the p < 0.05 level

Three individual LMMs were run to examine whether time significantly predicted changes in teachers' perceptions of the three barriers they rated to be most serious at the preintervention time point: lack of training on children with problems, lack of training on interventions, and lack of training in research procedures. Results indicated that time significantly predicted decreases in teachers' perceptions of these barriers: lack of training on children with problems ($\beta_1 = -0.60, p < .05$), lack of training on interventions ($\beta_1 = -0.62, p < .05$) .05), and lack of training on research procedures ($\beta_1 = -0.67$, p < .05; see Table 22 for results). Levels of significance were maintained once FDR procedures were applied. Model diagnostics were completed for each model, respectively. Visual inspection of Q-Q plots, as well as scatterplots of conditional residuals plotted against the conditional predicted values, did not suggest the presence of outliers, nor any normality or variance concerns. The null hypothesis (i.e., assuming the normality of residuals) of the Shapiro-Wilk test was non-significant for each model, supporting the normality of residuals for each respective model: lack of training on children with problems (p = .91), lack of training on interventions (p = .15), and lack of training on research procedures (p = .25).

Fixed Effect	Coefficient	Standard Error	<i>t</i> –ratio	Approx. <i>d.f.</i>	<i>p</i> -value	Corrected <i>p</i> -value
Lack of training on chi	ildren with pro	blems				
Intercept, β_o	4.65	0.63	7.39	45	.00	
Time slope, β_1	-0.60	0.26	-2.28	31	.03*	.03*
Final Estimation of Va	riance Compo	nents				
Random Effects	Standard	Variance	χ_2	<i>p</i> - value		
	Deviatio	Component				
	n					
Intercept	0.75	1.31	1.75	.08		
Level-1, e	0.55	2.12				
Lack of training on int	erventions					
Intercept, β_o	4.50	0.60	7.50	44	.00	
Time slope, β_1	-0.62	0.26	-2.35	32	.03*	.03*
Final Estimation of Va	riance Compo	nents				
Random Effects	Standard	Variance	χ_2	<i>p</i> - value		
	Deviation	Component				
Intercept	0.54	0.73	1.35	0.18		
Level-1, e	0.54	2.11				
Lack of training in rese	earch procedur	es				
Intercept, β_o	4.56	0.57	8.03	42	.00	
Time slope, β_1	-0.67	0.26	-2.60	31	.01*	.03*
Final Estimation of Va	riance Compo	nents				
Random Effects	Standard	Variance	χ_2	<i>p</i> - value		
	Deviation	Component				
Intercept	0.43	0.34	0.80	0.43		
Level-1, e	0.53	2.03				

Table 22 Top Three Rated Barriers to EBI Implementation

*significant at the p < 0.05 level

Follow-Up Analyses Results

Given the variation in the number of training hours completed by participants, additional linear mixed models were used to address questions 1a-c, 2a, and 4. In each follow-up linear mixed model, the number of training hours completed at each time point (i.e., pre-, mid-, and post-intervention) served as the time-varying predictor variable. The number of completed training hours was not found to be a significant predictor of changes of the following dependent variables, in any of their respective models: TSQ Perceptions of Positive Strategy Usefulness ($\beta_1 = 0.12, p > .05$); TSQ Perceptions of Negative Strategy Usefulness ($\beta_1 = 0.00, p > .05$); TSQ

Frequency of Positive Strategy Use ($\beta_1 = 0.04, p > .05$); TSQ Frequency of Negative Strategy Use ($\beta_1 = -0.03, p > .05$); TSQ Frequency of Working with Parents Strategy Use ($\beta_1 = -0.03, p > .05$); self-efficacy in classroom management ($\beta_1 = 0.00, p > .05$); attitudes towards evidence-based practices ($\beta_1 = -0.01, p > .05$); barriers to implementation of EBPs/EBIs ($\beta_1 = 0.01, p > .05$).

Three LMMs were used to assess whether the number of training hours significantly predicted changes in the top-three implementation barriers rated to be most problematic at the pre-intervention time point. Results indicated that the number of training hours did not significantly relate to changes in participants' ratings of the following barrier: lack of training on children with problems ($\beta_1 = -0.03$, p > .05). While significance was found for the barriers lack of training on interventions ($\beta_1 = -0.03$, p < .05) and lack of training in research procedures ($\beta_1 = -0.03$, p < .05) in the respective models, these levels of significance were not maintained once FDR procedures were applied.

Research question 2b was also re-examined using negative binomial regression analyses, to determine whether the number of training hours significantly related to changes in participants' observed use of the four specified classroom management strategies. Number of training hours was not found to significantly relate to changes in participants' observed use of general praise statements ($\beta_1 = -0.01, p > .05$); specific praise statements ($\beta_1 = -0.01, p > .05$); or harsh reprimand statements ($\beta_1 = -0.03, p > .05$). Training hours was found to significantly predict observed changes in participants' use of explicit reprimand statements ($\beta_1 = -0.02, p < .05$); however, this level of significance was not maintained once FDR procedures were applied (See Table 23).

Fixed Effect	Coeff	Standard	z value	z valuo n voluo	Corrected
	icient	Error	2-value	<i>p</i> -value	<i>p</i> -value
General Praise					
Intercept, β_o	2.11	.34	6.11	.00	
Hours point slope, β_1	-0.01	.01	-0.71	.48	.48
Specific Praise					
Intercept, β_o	0.77	.30	2.59	.00	
Hours point slope, β_1	-0.01	.01	-0.98	.33	.44
Explicit Reprimand					
Intercept, β_o	1.86	.21	8.99	.00	
Hours point slope, β_1	-0.02	.01	-2.14	.03*	.12
Harsh Reprimand					
Intercept, β_o	-0.48	.48	-0.98	.33	
Hours point slope, β_1	-0.03	.02	-1.40	.16	.32
*significant at the $n < 0.05$ lev	al				

Table 23 Results of Negative Binomial GLMMs for BCIO-R Variables

*significant at the p < 0.05 level

Acceptability Ratings

Teacher's acceptability of the IYTCM group training was assessed following the completion of the training sequence using the TEI-SF. The midpoint rating of 27 is considered to be the cut-off point for treatment acceptability by the measure developers (Kelley et al., 1989). Results suggest high levels of IYTCM group training acceptability (M = 37.93, SD = 3.59), and all participant ratings fell above 27 (minimum score = 33).

Chapter 5

DISCUSSION

Schools have the potential to serve as key service delivery systems, in terms of providing children and families with evidence-based mental health supports (Chambers et al., 2005). While there has been a major push in recent years to identify evidence-based programs and interventions, there remains a gap in effectively adopting and implementing these services within educational contexts (Ennett et al., 2003; Hicks et al., 2014). Thus, there is a great need for transportability research, in which factors that both facilitate and impede practitioners from successfully utilizing EBPs/EBIs in their every day practice are identified (Fixsen et al., 2005). The Incredible Years Teacher Classroom Management program is one such program that has great potential to positively impact children's social, emotional, behavioral, and academic skill development by way of equipping educators with knowledge and skills in EBPs/EBIs (Webster-Stratton et al., 2012). Previous efficacy literature has documented the positive outcomes, at both the teacher and student levels, that result from teachers' participation in the IYTCM training program (e.g., Webster-Stratton, Reid, & Hammond, 2001; Webster-Stratton et al., 2004; Webster-Stratton, Reid, & Stoolmiller, 2008). However, limited studies have examined issues of transportability related to IYTCM implementation, such as Implementation Drivers (e.g., Shernoff & Kratochwill, 2007). As a result, questions remain regarding the level of resources needed for effective implementation, the contexts in which the IYTCM program yields the most positive results, and the individual-level barriers that prevent educators from utilizing the IYTCM strategies to support students and families. Without this knowledge, schools are illequipped to appropriately allocate resources in areas such as teacher professional development, student mental health, and EBPs/EBIs.

The purpose of this study was to examine personal-level factors (i.e., perceptions, attitudes, behaviors) in relation to the transportability IYTCM group training program. This study aimed to add to the existing literature base on the use of the IYTCM program by examining outcomes through the lens of implementation science, given that only one previous study has examined potential implementation barriers related to an adapted version of the IYTCM program (Shernoff & Kratochwill, 2007). Examining the ways in which teachers' perceptions and behaviors change in response to participating in the *IYTCM* group training over a period of six months, as well as considering the ways in which personal beliefs might serve as potential barriers to educators' adoption the *IYTCM* strategies, is the first important step in aiding communities' uptake of this highly reputable EBP.

The theoretical framework for this study proposed that, although multiple systems- and individual-level factors interact during the implementation process, the study of personal implementer characteristics may be especially important to consider within the context of school-based implementation, to ensure that resources are appropriately allocated to the school-based practitioners who have the greatest need for intervention support, as well as those individuals who would be most receptive to receive such support (e.g., Cook et al., 2015; Fixsen et al., 2005). Personal beliefs, such as attitudes towards EBPs/EBIs and one's self-efficacy in utilizing an EBP/EBI, may be key reasons as to why EBPs/EBIs are under-utilized in practice (Durlak & DuPre, 2008). By providing educators direct instruction, and scaffolding, in the use of effective prevention and intervention strategies, educators are able to build both their confidence and competence in supporting children's social-emotional and behavioral development (e.g., Durlak & DuPre, 2008; Webster-Stratton, 2012). Thus, this study hypothesized that teachers' participation in *IYTCM* group training across the recommended six-month training period would

result in teachers' personal beliefs changing in the desired direction, including their: perceptions of the usefulness of positive and negative classroom management strategies, self-reported frequency of use of positive and negative classroom management strategies, attitudes towards EBPs/EBIs, self-efficacy in classroom management, and perceived barriers to EBP/EBI implementation. Given the previous literature, which cites changes in beliefs to be important precursors to behavior change (e.g., Andreou & Rapti, 2010; Cook et al., 2015; Durlak & DuPre, 2008; Gaudrea et al., 2013; Nelson & Steele, 2007), this study's secondary hypothesis was that observed changes in teachers' use of classroom management strategies would be observed across the intervention period as well. Changes in teachers' perceptions and behaviors were first examined in relation to time (i.e., pre-, mid-, and post- intervention time points). Given the variability in teacher attendance across the training period, follow-up analyses were conducted in which changes in perception and behavior dependent variables were examined in relation to training hours (i.e., cumulative number of IYTCM training hours completed by participants at pre-, mid- and post-intervention time points).

Changes in Teacher Beliefs

This study examined changes in four teacher beliefs in relation to participation in the *IYTCM* group training: perceptions of classroom management strategy usefulness and self-reported use of those strategies, attitudes towards EBPs/EBIs, self-efficacy in classroom management, and perception of implementation barriers.

Results indicate that neither time, nor the number of training hours completed by participants across the intervention period, significantly predicted changes in teachers' perceptions of the usefulness of both positive and negative classroom management strategies. Previous effectiveness research has found positive changes in the desired direction for both of

these perception variables (Carlson et al., 2011). However, independent research has not consistently found significant changes in participants' usefulness ratings of inappropriate strategies, due to low ratings of these strategies at the pre-intervention time point (Carlson et al., 2011; Hicks et al., 2015). The results of this study are similar, in that changes in the desired direction were noted, despite the levels of non-significance; this was likely due to high and low rating levels, respectively, at the pre-intervention time point. As a comparison, in this study, teachers' ratings of the usefulness of positive strategies at each time point (pre-intervention M =60.38; mid-intervention M = 63.82; post-intervention M = 62.73) were very similar to the mean ratings reported by Carlson and colleagues (2011; pre-intervention M = 54.50; post-intervention M = 63.1; follow-up M = 62.5). A comparison of participants' mean ratings of negative strategy usefulness also reflected similar trends across the two studies (current study pre-intervention M =16.38, mid-intervention M = 16.94; post-intervention M = 15.87; Carlson et al., (2011) preintervention M = 17.00, post-intervention M = 16.50; follow-up M = 15.60).

This study also yielded non-significant changes in teachers' self-reported use of positive and negative strategies, in relation to both time and number of training hours completed. While this study's findings are inconsistent with previous literature, which has noted significant increases in teachers' self-reported use of positive strategies (Carlson et al., 2011; Hicks et al., 2015; Shernoff & Kratochwill, 2007), the non-significant decreases in self-reported use of negative strategies and strategies for working with families, aligns with previous research findings (Carlson et al., 2011; Hicks et al., 2015). Again, examination of participants' ratings of their use of these strategies at the outset of the intervention likely helps to explain why significant linear changes were not observed across the intervention period. The pre-intervention ratings reported within this study (Positive Strategy Use M = 59.63; Negative Strategy Use M =
15.88; Working with Parents Strategy Use M = 26.33) are comparable to pre-intervention mean ratings reported in previous research (Carlson et al., 2011; Positive Strategy Use M = 56.50; Negative Strategy Use M = 15.60; Working with Parents Strategy Use M = 29.9). What is interesting about the comparison between these two studies is that the current study aimed to implement the IYTCM group training as intended (i.e., full-day monthly training sessions across a six month training period for a total of 42 training hours), with minor adaptations (i.e., spacing between sessions). The study conducted by Carlson and colleagues (2011) examined the outcomes of a IYTCM group training that was more significantly adapted (i.e., implementation of eight training sessions across an 8-10 week period for a total of 32 training hours). While the current study offered the full 42-hours of training across a six-month period, attendance rates were considerably lower (attendance rates ranged from 33% to 86%; average hours completed M = 28.33) than those reported by Carlson and colleagues (2011; attendance rate was 100%; 32) hours completed by all participants). Yet, in spite of these adaptations, results reported by Carlson and colleagues (2011) were either comparable to, or better than, this study's findings with regards to the observed trends of the TSQ perception variables. This observation, while not conclusive, highlights the importance of continued research on the adaptations that can, and should, be made in order to increase the accessibility of the *IYTCM* group training program to educators without the availability of research supports and/or the large scale investments in transportability of IYTCM via training of all teaching personnel within a country (i.e., Wales, Ireland; McGilloway, et al., 2012; Hutchings et al., 2007), while continuing to uphold the program's integrity.

This study also hypothesized that positive changes in teachers' attitudes towards EBPs/EBIs would occur across the intervention period in relation to both time and the number of

training hours completed. This hypothesis was not supported, as a non-significant linear decrease was observed. This is incongruent with previous research that has documented positive changes in EBP beliefs following trainings in relation to practitioners' participating in trainings on EBPs (e.g., Bearman et al., 2014; Cook et al., 2015; Lim et al., 2012). At the pre-intervention time point, the mean rating of the EBPAS total score (M = 2.82, SD = .56) within this study was found to be comparable to national norms (M = 2.73, SD = .49), as well as means reported in previous research conducted within other practice domains, such as occupational therapy (Hitch, 2016; M = 2.83, SD = .87) and substance abuse counselors (Smith, 2013; M = 2.98). Research has noted that individual-level factors (i.e., level of educational attainment and experience level) as well as systems-level factors (i.e., organization size, perceptions of organization's culture, outcome measures used by organization) significantly impact attitudes towards EBPs/EBIs (e.g., Aarons, 2004; Hitch, 2016; Smith, 2013). Individual- and systems-level factors related to evidence-based practice attitudes were not explored in this study; it may be important to consider them as potential confounding factors. For instance, previous research suggests that, in comparison to professional staff within the mental health field, interns were more likely to have positive attitudes towards EBPS, as indicated by higher EBPAS total scores (Aarons, 2004). It may be that interns and professional staff differed not only in their educational experiences, but also where they were at within their educational and professional trajectories. Given the more recent emphasis on EBPs, interns within the study conducted by Aarons (2004) may have been more aware of, or open to, EBPs compared to staff members whose educational or training experiences may have placed less of an emphasis on EBPs. The same logic can be applied to the current study, in that other factors, such as educational experiences, may have influenced the results. It is also important to recognize that the EBPAS has not been previously used with a sample of

educators; although the calculated reliability estimates for the current study were acceptable, further adjustments to the EBPAS may need to be made in order for it to be a valid and reliable measure for use within the field of education.

Contrary to this study's hypothesis, teachers' self-efficacy ratings in classroom management did not significantly increase across the intervention period in relation to time or the number of training hours completed. While a slight increase was noted from pre- to midintervention time points, participants' post-intervention ratings fell lower then their baseline ratings. While this non-significant linear decrease from pre-, to mid-, to post-intervention time points was unexpected, it is important to note that self-efficacy ratings at the outset of the intervention were quite high (M = 7.34; highest rating possible = 9), and ratings at all three measurement time points (pre-intervention M = 7.34, mid-intervention M = 7.61, postintervention M = 7.29) were comparable to mean ratings reported in previous research that examined teachers' CMSE (e.g., Bullock et al., 2015; M = 7.9). Although previous research suggests that professional development in classroom management should result in practitioners' increased confidence (e.g., Hicks-Hoste et al., 2015; Shernoff & Kratochwill, 2007), high preintervention ratings may not have allowed for substantial growth within the current study. It is surprising that teachers who, on average, indicated high levels of CMSE elected to enroll in the *IYTCM* group training. Future research that pairs quantitative measures of CMSE with qualitative reflections of teachers' feelings of CMSE, may help to capture any personal transformations related to feelings of self-efficacy that occur as a result of the IYTCM program.

Finally, teachers' perceptions of implementation barriers did not significantly change in relation to the number of training hours completed by participants. However, time was found to be a significant predictor of changes in this perception variable; more specifically, significant

linear decreases occurred in teachers' perceptions of implementation barriers occurred across the three time points (pre-, mid-, post-intervention). Previous research has found that teachers' level, or quality of, training in EBIs relates to their ability to use EBIs within their every day practice (Hicks et al., 2014); this study extends previous research, in that the results suggest that perceptions of implementation barriers can change for teachers enrolled in the *IYTCM* program. While causality cannot be assumed given this study's limitations (i.e., no control group, limited sample size, training hours found as a non-significant factor), these findings add to the previous research on implementation barriers related to the *IYTCM* program (i.e., Shernoff & Kratchowill, 2007) by examining changes in these important educator perceptions across the intervention period.

Item analysis revealed additional findings. Prior to participating in the *IYTCM* program, educator's rated *lack of training* on children with problems, on interventions, and in research procedures to be the most significant barriers to their adoption of EBIs. This is congruent with previous research implicating insufficient staff training as a key barrier (Hicks et al., 2014; McGoey et al., 2014; Reinke et al., 2011).

While *lack of training* was also noted as a significant barrier at the mid-intervention time point, *lack of training* in any area was not rated a significant barrier following the *IYTCM* training. The decreasing trend in participating teachers' ratings of the seriousness of "lack of training on interventions," "lack of training in research procedures" and "lack of training on children with problems" were found to be significant in relation to time, in that the mean ratings of these barriers significantly decreased over the intervention period. *Lack of time* was the prominent theme in participants' post-intervention responses, including a *lack of time* to investigate and create interventions, as well as time to analyze behaviors. Taken together, these

results may suggest that involvement in group training in the *IYTCM* program may equip preschool teachers with the training in classroom management they need to feel knowledgeable and capable of implementing other EBIs with their students; however, despite increased training in EBIs, educators do not always have the time they need to implement EBIs with fidelity. Insufficient time has been noted as a significant barrier in previous research (McGoey et al., 2014). While this is a frustrating barrier for educators to encounter, the fact that it is an external and alterable variable (opposed to being internal and unalterable) is promising; future implementation research on Leadership Drivers (Fixsen et al., 2009) can continue to explore the ways in which administrators can help navigate these barriers with their staff.

Changes in Teacher Behaviors

Contrary to previous research on the *IYTCM* group training (Hutchings et al., 2007; Reinke et al., 2013; Webster-Stratton et al., 2008), preschool teacher participants in this study were not observed to significantly increase their use of effective/positive classroom management strategies (i.e., specific praise, explicit reprimand), nor significantly decrease their use of ineffective/negative classroom management strategies (i.e., general praise, harsh reprimand) across the three measurement time points. This is incongruent with this study's hypothesis that participants' use of an effective classroom management strategy, such as explicit reprimand statements, would increase in response to participation in the IYTCM group training. Although previous research has found significant decreases in reprimand use for IYTCM participants (Reinke et al., 2013), rates reported by Reinke et al., (2013) were higher than those found within the current study. Additionally, this study's findings may be interpreted in multiple ways. For instance, decreases in explicit reprimand use may reflect that teachers are not consistently using an evidence-based strategy to correct children's problematic behaviors. Alternatively, a decrease may suggest that teachers' are finding less of a need to use reprimand as a correction strategy, as a result of decreasing rates of students' problematic behaviors. Student behavior was not measured in this study, but efficacy research has documented the positive effects of *IYTCM* on student externalizing behavior (Reinke et al., 2012). Additionally, the *IYTCM* program supports teachers' use of proactive strategies to help prevent problematic student behavior.

A non-significant decrease was found in the teachers' use of general and specific praise. In light of this non-significant finding, it is important to consider how teachers' use of these strategies compares to those reported in previous research (e.g., Reinke et al., 2013). Reinke and colleagues (2013) used the BCIO-R to assess pre- to post-intervention changes in teachers' behavior in the context of a *IYTCM* group training plus coaching support model; they reported teachers' use of classroom management strategies in terms of average-per-minute rates. The average-per-minute baseline rates of teachers' use of general praise reported in previous research (M = 0.50) are higher than those calculated within the current study (M = 0.35). Teachers' use of general praise statements per minute at the post-intervention rates, as reported by Reinke and colleagues (2013; M = 0.24) are slightly lower than the pre-intervention rates within the current study; this may suggest that within the context of the current study, low pre-intervention rates of general praise use did not allow for significant changes to be observed at the mid- and postintervention time points. Similarly, within the current study, teachers' observed use of specific praise (M = 0.10) is comparable to pre-intervention rates reported by Reinke and colleagues (2013; M = 0.08); however, Reinke et al. (2013) found that teachers' use of specific praise statements significantly increased in response to the intervention, whereas non-significant decreases were noted within the current study. While it is disconcerting that teachers' use of specific praise did not significantly increase, given that there is a strong emphasis on effective

use of praise within the *IYTCM* second training session, it may be important to consider this finding within the context of Michigan's recent adoption of the Preschool Program Quality assessment (PQA). The PQA, which was developed by High Scope Educational Research Foundation, is an observational rating assessment tool used to assess the quality of preschool programs (Epstein, 2003). It has been adopted by the Michigan Department of Education and is required for Michigan Great Start Readiness Programs (GSRP;

http://www.michigan.gov/documents/mde/GSRP-Overview_410757_7.pdf). Perceived incongruences between the PQA standards and *IYTCM* program content, pertaining specifically to teachers' use of praise, rewards, and incentives, were discussed during the *IYTCM* second training session. For instance, the PQA standards distinguish "encouragement" from "praise," whereas the *IYTCM* training content focuses on the distinction between effective and ineffective praise. Teachers' familiarity, or experience, with the PQA, as well as their familiarity with research on the effectiveness of specific praise, may explain the results of the current study, in terms of low pre-intervention rates and changes in the undesired direction over time. Additionally, unaccounted for systems-level factors (i.e., administrator views on the PQA and praise) may have influenced this study's results.

Again, while neither proactive teacher strategies nor student problem behavior were measured within this study, these factors may help to understand the results. The use of the Brief Student-Teacher Classroom Interaction Observation code (Herman & Reinke, in press), which simultaneous collects counts of teacher behaviors and student behaviors (i.e., disruptions/offtask) during a pre-determined time period, may be able to better capture the bidirectional nature of students' behaviors and teachers' use of classroom management strategies.

Relation of Belief Change to Behavior Change

Cognitions and behaviors are reciprocal in nature, and therefore changes in practitioners' beliefs are likely to result in behavior change (e.g., Durlak & DuPre, 2008). Within educational contexts, educators' beliefs can shape how they verbally and behaviorally interact with their students (Klassen et al., 2011). Despite previous literature that has documented the positive effects professional development can have on shifting practitioners' beliefs and behaviors (e.g., Gaudrea et al., 2013; Hutchings et al., 2007; Reinke et al., 2013; Ross & Bruce, 2007; Webster-Stratton et al., 2008), this study did not find significant relationships between changes in teachers' beliefs (i.e., self-efficacy in classroom management and their perceptions of the usefulness of positive classroom management strategies) and their observed use of positive and negative classroom management strategies across the pre-, mid-, and post-intervention time points. However, these results should be interpreted in light of the fact that these teacher beliefs were not found to significantly increase over the course of the intervention period, possibly due to high ratings of these variables at the pre-intervention time point. As a result, any relationship between belief- and behavior-change may not have been detected. Despite these non-significant findings, continued exploration of the ways in which perceptions are influenced by the IYTCM training, and how changing beliefs lead to behavior change will be important in terms of identifying the key mechanisms of change within this evidence-based program. For instance, if future research identifies a specific type of practitioner belief to be a key mechanism of change leading to positive behavioral outcomes for stakeholders, the IYTCM trainings may need to incorporate training strategies that focus more heavily on challenging those practitioners' beliefs and/or misconceptions. In comparison, it may be that, regardless of practitioners' preintervention beliefs or the amount of change that occurs in their beliefs across the training

sequence, what is most needed is continued hands-on training, experiential practice, and on-site coaching to ensure that teachers are implementing classroom management strategies accurately and with fidelity. For instance, teachers may have positive beliefs about the IYTCM strategies and their ability to implement those strategies at the outset of the training, but are not able to consistently translate those beliefs into effective and consistent classroom management practices; as a result, the IYTCM trainings would need to make adaptations to better account for the factors impeding effective implementation.

Acceptability of Treatment

Results of teacher participants' ratings of acceptability for the overall program indicated high levels of program acceptability. Previous research highlights the importance of program acceptability in relation to program outcomes (Durlak & DuPre, 2008). However, in spite of high levels of acceptability, participant attendance was inconsistent across the intervention period. This might suggest that, although participants had positive feelings towards the *IYTCM* group training approach and content, unaccounted factors limited or hindered their ability to fully participate in the training sequence. Lack of time has been noted in previous research as a significant barrier to teachers' access to, and use of, EBPs/EBIs (e.g., McGoey et al., 2014). Furthermore, models of implementation science highlight the importance of noting and navigating implementation barriers related to limited resources, such as time (Durlak & DuPre, 2008; Fixsen et al., 2009). While IY program developers emphasize the importance of treatment adherence and the use of certified group leaders, to ensure that the program yields similar results to those found in efficacy research, the study's findings speak to the need for treatment differentiation. Commitment to full day training sessions across a six-month period may not be feasible for educators, unless implementation resources (e.g., time, funding) are made readily

accessible by innovation leaders. Continued research on factors that limit practitioners' ability to implement the *IYTCM* group training program in its recommended format (i.e., six full day workshops across monthly sessions), as well as outcomes of effectively adapted versions of the *IYTCM* program, will help to inform both the research and practice communities of ways in which the program can be adjusted to meet participant needs without compromising treatment integrity.

Treatment Procedural Integrity

The results of this study indicated that the procedural integrity of the IYTCM training sessions were maintained throughout the study. Fidelity measures included training checklists completed by the certified trainer following each session, as well as two random observations of training sessions conducted by the primary researcher; both observations indicated 100% agreement with the fidelity checklists submitted by the trainer. This suggests that implementation procedures of the group trainings were carried out as outlined by the program manual, with minor adaptations made to accommodate the needs of the participants.

The *IYTCM* group trainings were offered in full day sessions across a six-month period, as recommended by program developers (Webster-Stratton, 2012). However, due to unforeseen circumstances (e.g., illness of the trainer, conflicts in participants' schedules), adjustments were made to the amount of time that occurred between sessions. Additionally, attendance rates varied considerably across the training sessions (average number of hours completed by participants = 28.33 hours; range of hours completed = 21 to 42; recommended number of total training hours = 42 hours), in spite of favorable acceptance ratings. One factor that may help to explain these results is that, within the state of Michigan, educators are required to earn annual SCECHs in order to maintain their educator certificate or Child Development Associate (CDA)

credential. Educators working as home providers are required to earn 10 SCECHs per year; educators working at child care centers are required to earn 16 SCECHs per year (http://www.childcarelounge.com/approval/michigan.php); educators within public education settings are required to earn 30 SCECHS per year (http://www.michigan.gov/mde/0,4615,7-140-5683-219674--,00.html). By participating in the IYTCM training sessions, educators had the opportunity to earn 5.5 SCECHs per session; full participation in all six IYTCM trainings would have resulted in 33 SCECHs. For participants working in home-based or child care programs, they could have participated in only two or three IYTCM training sessions, in order to meet their annual training requirements. Also, it may have been that participating teachers earned SCECHS by participating in other activities, ones that were already embedded within their work responsibilities (e.g., supervision of a teacher intern, new teacher mentor, serving as member of school improvement team, attending professional development sessions/conferences required by school administration) or those that appealed to their personal interests. As a result, they may have chosen to participate in the minimum number of IYTCM training sessions they needed in order to meet their annual SCECHs requirements. For example, within the current study, out of the seven participants who worked within childcare settings, four individuals participated in 24 or fewer hours of IYTCM training; this level of participation still allowed them to earn their required number of annual SCECHs. However, in comparison, all of the four home-based providers who participated in the study attended, at minimum, 27 hours of IYTCM training, well surpassing the number of annual SCECHs required (i.e., 10 SCECHs). While no conclusions can be drawn from this data, it does suggest that workplace settings and licensure requirements may influence educator's ability, or motivation, to participate in professional development opportunities, such as the IYTCM program.

The results of this study should be interpreted in light of this information. Future research should also explore this issue, as it relates to finding ways to feasibly and successfully implement the IYTCM program in varying early childhood educational settings for a range of preschool professionals.

Overall Results and Implications

Based on the IY theoretical framework, it was expected that participation in the IYTCM group training program over a six-month training period would result in positive changes in teachers' perceptions and behaviors. Contrary to hypotheses, neither time nor training hours significantly related to changes in teachers' perceptions of classroom management strategies, their self-efficacy in classroom management, their attitudes towards evidence-based practices, or their use of effective (i.e., specific praise, explicit reprimand) and non-effective (i.e., general praise, harsh reprimand) classroom management strategies. Significant changes in participants' perceptions of implementation barriers did occur across pre-, mid-, and post-intervention time points. While the majority of the study's findings are incongruent with those published within efficacy research on IY, readers are cautioned against making assumptions on the IYTCM program's effectiveness. There were many unpredictable, real world barriers that influenced the implementation of the *IYTCM* program within the current study. Furthermore, as previously discussed, the self-report and observational measures used in this study may not have fully captured participants' positive responses to the program like the overall high treatment acceptability ratings did. For instance, the BCIO-R observational measure only captured brief snapshots of teachers' interactions with students. The severity or frequency of student problematic behaviors were not measured in this study, and as a result, the bidirectional nature of teacher and student interactions was left unexplored and the more global nature of the IYTCM

group training acceptability ratings may have captured this change more effectively. Furthermore, self-report measures should always be interpreted in the light of reporter bias. While self-perceptions are key pieces of information, examining them in relation to objective measures may help to validate them.

Readers are encouraged to consider this study's non-significant findings within the context of participants' high acceptability ratings. High acceptability ratings suggest that participants enjoyed the group-nature of the program format, as well as found the training strategies and content to be acceptable. They may also suggest that the IYTCM program can serve as an appealing and enjoyable professional development training program for early childhood educators.

However, prior to investing substantial financial and personnel resources for the adoption and implementation of the IYTCM program, future research must give consideration to the individual- and systems-level factors that have the potential to influence program outcomes. For instance, as previously mentioned, continuing education requirements for preschool educators differ based on the setting/program in which they're employed. The standard IYTCM training sequence requires a large time commitment (i.e., 42 hours) for preschool educators, who may not want to participate in training beyond what is required for their certification renewal or by their administration. Failure to participate in the full training sequence may result in limited opportunities for participants to practice, and receive feedback in, the targeted skills; this likely has negative effects on participants' ability to develop and maintain these skills. Additionally, as previously discussed, systems-level standards have the potential to influence participants' perceptions of the IYTCM program content. The adoption of the PQA within the state of Michigan has resulted in increased discussion and criticism of preschool educator's use of praise

statements with their students. As a result, participants in the current study may have begun the ITYCM training sequence with strong feelings about one's use of praise with students, as a result of their own personal convictions or a consequence of policy/administration standards imposed upon them. This, then, may have limited their willingness to discuss the topic of praise through the lens of the IYTCM training, which emphasizes the idea of effective versus ineffective praise. Both of these examples provide evidence for the need of comprehensive transportability research, in which the interactive nature of implementation drivers at the systems- and individual-levels is evaluated.

Limitations

It is important to note the limitations of this study, in how they relate to the study results and to inform future research on the Incredible Years Teacher Classroom Management training program. First, this study's small sample size limits the external validity of results. Participants were recruited from three counties in Western Michigan, and enrolled participants included primarily preschool educators working at private early childhood centers (N = 14). As a result, this study's results cannot be generalized to early childhood educators in other Michigan counties as well as educators outside of Michigan. Furthermore, although early childhood educators within the state of Michigan are expected to meet the educational standards outlined in the ECSQ-PK and ECSQ-PK licensure documents, it is still reasonable to assume that educational practices vary between and within public and private educational settings, due to differences in populations served, differences in administrative practices, and differences in educators' access to resources (including but not limited to, professional development training opportunities, classroom materials/supplies, and support/consultation service professionals).

Internal validity of this study may also be limited, due to the lack of a control group. Presence of a control group within experimental research allows for critical examination of the effectiveness of an intervention program compared to the absence of the intervention program, which allows for generalization of results to similar contexts (i.e., individuals, settings). Therefore, it is unclear whether the results of this study can be attributed to the *IYTCM* group training or an unaccounted for variable. However, previous experimental research on the *IYTCM* group training that has included a no-treatment control group, has resulted in significant and positive changes in teachers' behaviors and beliefs for those who participated in *IYTCM* group training compared to control group teachers (e.g., Herman et al., 2011; Webster-Stratton et al., 2004; Webster-Stratton et al., 2008). Thus, while this study's results could be strengthened by the presence of a control group, they should not be discounted based on the previous research which documents favorable outcomes of the *IYTCM* group training.

A third limitation of this study was the adjustments that were made to the *IYTCM* group training schedule. While the *IYTCM* group training was implemented across a six-month period, which aligns with recommendations put forth by program developers (Webster-Stratton, 2012), the timing of the training sessions was adjusted to account for real-world implementation barriers (i.e., illness of the *IYTCM* group trainer, conflicts in participants' schedules). In previous efficacy research, the *IYTCM* group trainings have been implemented once per month, across the sixmonth period, so that participants would have approximately one month to practice targeted skills prior to the next training session (Webster-Stratton et al., 2004; Webster-Stratton et al., 2008). In this study, two training sessions had to occur during a single month, which decreased the amount of time participants had to practice the targeted skills between sessions. While this

adjustment to the training sequence was not ideal, this limitation highlights a real world barrier practitioners are likely to encounter when attempting to adopt and implement the *IYTCM* group training in their work with teachers.

Similarly, recruitment challenges, consistent training participation, and participant dropout were significant factors in this study; although contacted administrators expressed interest in the *IYTCM* group training opportunity, teacher enrollment and attendance were problematic. This might be explained by constraints on teachers' time; the *IYTCM* group training is a time intensive professional development program that may have conflicted with teachers' other professional development and/or personal commitments. Additionally, 10 out of the 15 attrition cases were a result of teachers leaving their place of employment, implicating high staff-turnover as a probable barrier within early childhood education settings. Again, these serve as examples of real world barriers practitioners are likely to encounter when attempting to implement the *IYTCM* group training series. These limitations highlight the need for the examination of systems-level barriers to IY program adoption. Administrative support, including administrator's support of the intervention program as well as their leadership in navigating technical issues (e.g., access to resources, such as time and funding), is a key component of successful program adoption and implementation (Fixsen et al., 2009). While the administrators who were contacted during the recruitment phase of the current study expressed interest in the program, prior commitments to professional development in other domains (e.g., new academic curricula, *Positive Behavior Support* programs) disallowed them from committing, at a systems-level, to the *IYTCM* group training. Thus, participation relied solely on individual teacher interest and desire. Buy-in and support at the administrative level may have resulted in increased enrollment and follow-through.

Finally, although behavioral observation data was collected on teachers' use of positive and negative classroom management strategies (those which were specifically discussed in the *IYTCM* group trainings), the BCIO-R observational tool only captured a brief snapshot of teachers' daily practices at the pre-, mid-, and post-intervention time points. This observational method does not sufficiently capture teachers' implementation integrity of the many strategies teachers are taught within the *IYTCM* training curriculum. Furthermore, a key component of the *IYTCM* training program is teachers' development of a behavior plan for a student who is exhibiting a specific problematic behavior (Webster-Stratton, 2012). Potential positive changes in the teachers' problematic behaviors, were not captured by observational or survey data. Much of the currently available research on the *IYTCM* program examines changes at the class level, and as a result, may be failing to capture important and significant changes that are occurring in the individual students who are exhibiting the most severe or problematic behavior (as noted to occur in previous research; Webster-Stratton et al., 2008).

Implications for Research and Practice

In terms of the current study, future research should continue to examine *IYTCM* group training effectiveness through the lens of implementation science. Although many of the study's research questions did not yield statistically significant findings, readers are cautioned against drawing conclusions regarding the program's effectiveness within real world contexts. Rather, this study highlights the need for continued exploration of the factors that both facilitate and impede successful adoption and implementation of the *IYTCM* program. While this study focused specifically on the relation between personal implementer factors and program outcomes, future research should consider the ways in which Organizational, Leadership, and

Competency Drivers interact to influence implementation processes and outcomes (Fixsen et al., 2009). This will help inform the transportability of the *IYTCM* program, ensuring that the balance between treatment adherence and treatment differentiation is maintained.

While the results of this study did not indicate statistically significant changes in teachers' self-reported perceptions of the usefulness of the targeted classroom management strategies, their self-reported use those strategies, nor their self-efficacy in classroom management, participants' qualitative remarks shared with the IYTCM certified trainer did reflect feelings of substantial change and growth over the intervention period. For example, participants shared the ways in which their relationships with their students (particularly those students targeted with specific behavior plans due to their highly disruptive behaviors) greatly improved over the course of the training period. Participants also reflected on the ways in which they embedded proactive/preventative strategies into their daily routines, which they felt resulted in improved classroom climate and functioning. Therefore, future research should employ mixed method designs in which quantitative and qualitative data is gathered in order to capture potential changes (Owens et al., 2014). When completing the post-intervention surveys, participants commented that they wished they could go back and "redo" the pre-intervention surveys, sharing that, at the pre-intervention time point, their responses were likely inaccurate because they "didn't know what they didn't know." Asking participants to participate in interviews throughout the training sequence may help to produce a more complete picture of participants' feelings and changes in response to the intervention. Previous research in which quantitative data (i.e., TSQ survey, behavioral observations) has been paired with qualitative data (i.e., individual interviews with teachers) suggests that mixed-method designs allow for additional evidence of program effectiveness, and can provide important information beyond what is captured through surveys

and observational means (i.e., McGilloway, et al., 2012). For instance, McGilloway and colleagues (2012) collected quantitative survey and observational data related to teacher belief and behavior change; through qualitative interviews with teachers, they gathered additional insight into participants' perspectives of how the IYTCM program helped promote a positive classroom atmosphere, increased connectedness to and support from colleagues, and improved emotional well-being.

Additionally, low attendance rates and high attrition rates noted in this study suggest the presence of barriers that hindered teachers' full participation in the *IYTCM* group training program. While the benefits of group training across a six-month period have been documented in previous efficacy research (Reinke et al., 2012), adaptations to the training format (e.g., small versus large group), sequence (e.g., monthly sessions across a six-month period) and time investment (i.e., 42 total training hours) need to be explored in order to allow practitioners to feasibly and successfully adopt and implement the *IYTCM* program within their communities. This includes further exploration of the conceptual difference between treatment exposure (i.e., exposure to training session content either in group context or self-study) and treatment engagement (i.e., number of training hours attended), as well as how these two factors differentially relate to, or impact, program outcomes.

To ensure that the integrity of the program is not sacrificed, future research should continue to explore the effectiveness of various training formats, such as self-study models, online courses, and adaptations made to the group training sequence and timing. This also includes studies in which the IYTCM program is dismantled into individual training components (e.g., prevention strategies, social emotional coaching), then the effectiveness of each training component is evaluated and compared; this will help to determine the IYTCM program elements

that result in the most positive outcomes for educators and students (Reinke et al., under-review). This would not only allow researchers to identify the key mechanisms of change within the IYTCM program, it would help practitioners identify the components that need and should be maintained under circumstances in which the program length or timing needs to be adapted. Furthermore, this type of research would help administrators and practitioners determine which program components align best with the needs of the target population (e.g., teachers who report low self-efficacy in managing student problem behaviors may benefit more from IYTCM training components that focus on prevention strategies and social emotional coaching, but less from strategies that focus on building home-school collaboration; Reinke et al., under-review).

Finally, given the time intensive nature of the *IYTCM* group training program, continued exploration of the ways in which personal implementer factors relate to training outcomes will help to inform ways in which the program can be implemented within a multi-tier framework of teacher professional development (Thompson et al., 2012). For instance, studies with greater internal and external validity may find that measures of self-efficacy or attitudes towards EBPs/EBIs can help inform how receptive a teacher may be to participating in a professional development opportunity, such as *IYTCM*, as well as how likely they may be to successfully adopt the targeted strategies within their daily practice. These measures may also help to differentiate the teachers who need professional development in classroom management from those who have a solid foundation of knowledge and skills in this area, and thus additional training would be a misuse of resources. Given the limited nature of time, personnel, and financial resources within school settings, continued research in this area would help to ensure that training resources are allocated to the individuals who are in the most need of support, as

well as those who would be most receptive to the support (Myers et al., 2011; Reinke et al., under-review).

APPENDICES

APPENDIX A

Study Recruitment Flyer

Figure 1. Study Recruitment Flyer





What is the Incredible Years Teacher Classroom Management (IYTCM) Program? This program is an evidence-based intervention focused on improving teachers' skills in using classroom management strategies, handling child misbehavior, improving relationships within the classroom, teaching students appropriate problem-solving and friendship-making skills, and promoting strong home-school collaboration. (www.Incredibleyears.com)

When & Where?

IYTCM group, full-day trainings (9am-4pm) will be held at the MSU Extension Office (775 Ball Ave NE, Grand Rapids MI, 49503) on the following Saturdays: January 16, 2016 February 20, 2016 March 19, 2016 April 30, 2016 May 14, 2016 June 11, 2016

Classroom Management Study through Michigan State Extension

What does the study involve? Participating teachers will receive the IYTCM program across the course of the school year, from January 2016 to June 2016.

All teachers will be asked to 1) complete surveys and 2) allow research assistants to conduct classroom observations At three time-points (before, in the middle, and following the IYTCM group training)

Benefits!

- \$10 Gift card
- SCECHs
- Professional Development in an evidence-based program

Contact Us with Questions!

Primary Researcher: Taylor Hicks-Hoste <u>hickstay@msu.edu</u> 586.201.6842 IYTCM Trainer: Holly Tiret <u>tiret@anr.msu.edu</u>

APPENDIX B

Teacher Consent Form

What is this study?

You are being asked to participate in a research study that will investigate teacher classroom management strategies in relation to classroom variables. In this study, we are trying to learn more about the outcomes associated with involvement in teacher classroom management training, as well as teacher-level factors that affect these outcomes. Eligible participants include preschool through kindergarten teachers, as well as early childcare providers (i.e., individuals who work with children ages 3-6).

How will I be involved in this study?

If you volunteer for this study, you will receive group-based training in using the principles and strategies of the Incredible Years Teacher Classroom Management (IYTCM) Training Program. Group training sessions involve six full day workshops held on Saturdays (January-June 2016). Your involvement in this study will also include data collection procedures, which involves completing rating scales about your behaviors and beliefs. You will be asked to allow research assistants to observe within your classroom to gather information regarding behaviors. No information will be collected on, or from, students within the classroom. This research study will begin in December 2016 and end in June 2016 in order to include data collection before the study, the six-month intervention period, and data collection after the study. Participation in this research study is completely voluntary. You may choose not to participate at all, or you may refuse to answer certain questions or discontinue your participation at any time.

How will classroom information be kept confidential?

Each teacher will be assigned an ID number, which will be used in place of names in order to maintain confidentiality. All rating forms and data will be kept in a locked file cabinet and only the researchers will have access to this cabinet. Individual names and identifying information will not be used in any research reports.

What benefits or risks may occur if I choose to participate in the study?

Teachers will receive the benefit of receiving materials and supports related to an evidence-based intervention to improve classroom management strategies, which may lead to potential improvements in positive classroom atmosphere, teacher-student relationships, peer relationships, and child behavior. Teachers will also receive State Continuing Education Clock Hours (SCECHs) for continuing education renewal requirements and a \$10 gift card.

What if I have questions or concerns about this study?

If you have any concerns or questions regarding this study, you may contact the researcher Taylor HicksHoste through email (<u>hickstay@msu.edu</u>), regular mail (30961 Dorchester #393, New Hudson, MI 48165), or by phone (586-201-6842). You may also contact Dr. John Carlson through email (<u>carlsoj@msu.edu</u>), regular mail (Erickson Hall Building, 620 Farm Lane, Room 431, East Lansing, MI 48824), or by phone (517-432-4856). If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the Michigan State University Human Research Protection Program by phone at 517-355-2180, fax at 517-432-4503, email at <u>irb@msu.edu</u>, or by regular mail at 408 West Circle Drive Room 207 Olds Hall, MSU, East Lansing, MI 48824.

Informed Consent Form

Please sign and mail this form back to the researcher Taylor Hicks-Hoste (address indicated above). Your signature on this form indicates that you consent to participating in this research study and agree to participate in data collection procedures.

<u>Teacher Information:</u> Teachers' Name (please print):		
Teacher's Age (in months):	Teachers Gender (M/F):	
Teacher's School/Center:		
<u>Contact Information:</u>		
Address		
Home Phone	Cell Phone or Work Phone	
Email Address		

Signature of Teacher

Date

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