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Caregiver Concordance on Ratings of Child Behavior Problems in Parent-Child Interaction
Therapy

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy
in Counseling, Clinical, and School Psychology

by

Juan Carlos Gonzalez

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September 2023

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Therapy

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SELECTED PUBLICATIONS

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1. **Gonzalez, J. C.**, Klein, C., Barnett, M. L., Schatz, N., Chaco, A., & Fabiano, G. (2023). Intervention and implementation characteristics to enhance father engagement: A systematic review of parenting interventions. *Clinical Child and Family Psychology Review*, 1-15. <https://doi.org/10.1007/s10567-023-00430-x>
 2. Willis, H., **Gonzalez, J. C.**, Call, C., Torres, S., Quezada, D., & Galán, C. (2022). Future directions of culturally sensitive telehealth/mHealth interventions. *Journal of Clinical Child and Adolescent Psychology* 51 (6), 1053-1069. <https://doi.org/10.1080/15374416.2022.2124516>
 3. **Gonzalez, J. C.**, Flores, I., Tremblay, M., & Barnett, M. L. (2022). How lay health workers engage Latino fathers: a qualitative study. *Child and Youth Services Review*, 141, 1-9. <https://doi.org/10.1016/j.childyouth.2022.106601>
 4. Klein, C., **Gonzalez, J. C.**, Tremblay, M., & Barnett, M. L. (2022). Father Participation in parent-child interaction therapy: Predictors and therapist perspectives. *Evidence-Based Practice in Child & Adolescent Mental Health*, 1-15. <https://doi.org/10.1080/23794925.2022.2051213>
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ABSTRACT

Caregiver Concordance on Ratings of Child Behavior Problems in Parent-Child Interaction Therapy

by

Juan Carlos Gonzalez

Behavioral parent training programs are effective interventions in addressing a wide range of child behavior problems. Historically, these interventions have engaged a narrowly defined conception of caregivers, focusing on biological mothers, in part due to limited guidance on how to engage other caregivers and utilize their reports of child behavior problems in clinical decision making. Recent advances in methodological strategies to compare agreement between informants in the context of children's mental health allow us to identify domain-relevant information in instances when disagreement between caregivers yields clinically-relevant information about the child in services. The current study utilized concordance as measured by difference scores and correlations between two caregiver ratings in the context of a parent-child interaction therapy ($n = 57$). Comparison between concordance at pre-treatment and post-treatment suggest that there was a significant increase in caregiver agreement over the course of treatment for the level of intensity of child behavior problems. Regression models, used to test effects of child and caregiver characteristics on pre- and post-treatment concordance, found that only secondary caregiver

stress was significantly associated with caregiver disagreement. A final regression showed that there were no significant predictors in the change in agreement over the course of treatment. Findings provide preliminary evidence of domain-relevant information in regards to multiple caregiver ratings of child behavior problems. Clinical implications, including the importance of capturing when parents might be at risk for ending treatment in lower states of agreement, are discussed.

I. Statement of the Problem

A. Background and Significance

Children in the United States have increasing rates of mental health need despite an increased attention to the development and testing of interventions to support children and families (Perou et al., 2013). Existing interventions to support children and families include behavioral parent training programs (BPTs) which have shown to be effective in addressing disruptive behavior disorders (DBDs), one of the most common reasons for referral among children's mental health (Merikangas, et al., 2009; Eyberg, Nelson, Stephen, & Boggs, 2008). However, given that these interventions were largely developed with the intention to support mothers (i.e., female caregivers, historically seen as the sole primary caregivers of children) (Panter-Brick et al., 2014), male-identified caregivers, hereafter referred to as fathers, have generally been excluded from these interventions. As the general image of what families look like changes (Teti, Cole, Cabrera, Goodman, & McLoyd, 2017), our interventions, and ways of involving caregivers to support their children should too. Gender non-conforming caregivers, caregivers who do not fit the traditional mold, blended families, same-sex couples, and fathers are all examples of individuals who have not been systematically involved in the development or testing of parenting interventions. Thus, an increase in the attention we pay towards caregivers other than mothers will allow us a more holistic understanding of how to best support families with children in need. The hope is not to replace an existing knowledge base of effective parenting interventions but rather to expand who is included in conversations about BPTs and their associated outcomes.

Fathers have been shown to have make many unique contributions to children's development when involved positively in family life (Lamb, 2000; 2010). Additionally, evidence suggests father involvement in treatment could be related to sustainment of treatment gains (Bagner & Eyberg, 2003). Despite these positive outcomes, fathers continue to be engaged at strikingly low rates among children and families seeking services for children with DBDs (Jiang et al., 2018; Tully et al., 2018; Gonzalez et al., 2023). One recent survey of therapists delivering parenting services found that less than one in 5 therapists have fathers regularly attending sessions for the child clients (Tully et al., 2018). In fact, in a recent systematic review of father engagement in BPTs, 58% of included studies either failed to report on father engagement or had engagement rates below 50% (Gonzalez et al., 2023). Recently, Fabiano & Caserta (2018) posited that, among others, one explanation for these low rates of engagement is the lack of clear guidance regarding the integration of multiple informant measurement of child behavior problems. Without proper guidance on how to integrate information from multiple informants, or evidence that doing so may improve outcomes for children and families, providers may be reluctant to invite father and other caregivers into treatment. The ways in which multiple informant ratings relate to one another may provide us valuable contextual information about how informants are understanding their child's behavior and the degree to which they agree on parenting decisions, two aspects of parenting that may directly impact overall family functioning.

Novel methods, including using concordance, an analysis which allows clinical scientists to understand the relationship and agreement between multiple informants, could provide a model for clinical application that would support integration of various caregivers, including fathers, into children's mental health in a data-driven manner. Existing studies utilizing

concordance to compare parent and teacher ratings shows indicate parent-teacher concordance is moderate and may influenced by certain child characteristics such as cognitive abilities (Dickson et al., 2018).

The current study analyzed caregiver concordance in their ratings of child behavior problems within the context of parent-child-interaction therapy (PCIT), a best-practice intervention for children with DBDs. The sample included racially and ethnically diverse families that received PCIT in community settings in the Miami-Dade County region. These analyses, which to date have not been utilized in the context of PCIT, may provide a valuable framework to guide therapist seeking to integrate multiple caregiver ratings in session. Concordance may be used to monitor agreement between caregivers, which may have important implications for treatment success.

B. Context of the Current Study

Parent-Child Interaction Therapy (PCIT) is a behavioral parent training program (BPT) with decades of empirical evidence that places it as a gold-standard intervention for reducing child externalizing problems and parenting stress related to these behaviors (Lieneman et al., 2017; Eyberg, Nelson & Stephen, & Boggs, 2008). Although BPTs vary in their content and methods, most rely on a combination of didactic parent education of positive parenting techniques (e.g., praise, selective attention) intended to build upon the parent-child relationship and strengthen attachment, and effective discipline strategies (e.g., time-out; Kaminski & Claussen, 2017). PCIT is a highly structured intervention in which the first phase of treatment is dedicated to the development of the aforementioned parenting techniques and the second phase of treatment is where discipline strategies are taught and practiced. The entire intervention is delivered using play between the parent and the child in

which the therapist is coaching the parent in-vivo in the application of the skills being taught. A main feature of PCIT is the heavy reliance on outcome monitoring through the use of the Eyberg Child-Behavior Index (ECBI; Eyberg & Robinson, 1983; Boggs, Eyberg, & Reynolds, 1990), a 36-item, weekly parent-report measure administered before each session, which produces an intensity score translating to the severity of child behaviors overall, and a problem score, indicating an overview of the number of child behaviors that remain clinical target problems for each parent. The use of standardized outcome measures has utility in the current study comparing multiple informant reports of child behaviors.

Though treatment usually continues until a parent has met skill criteria and the child's behavior difficulties are within normal limits, time-limited PCIT has been developed and tested (Nixon et al., 2003). Data for the current study uses a time-limited version of PCIT, with a set number of sessions within each phase of the treatment. It has been proposed that time limited PCIT may support documented issues with treatment dropout and retention in PCIT (Lyon & Budd, 2021; Danko, Garbacz, & Budd, 2016). Time-limited samples of PCIT may be helpful in providing an initial examination of mother-father concordance in a community-based setting that is brief, efficacious, and more likely to have complete data for both caregivers.

C. The Current Study

To date, no study has 1) used concordance to examine caregiver agreement and disagreement on the ECBI within the context of PCIT, 2) examined the impact that child and parent characteristics have on agreement or disagreement among parents, or 3) explored how levels of concordance change within a family system over the course of PCIT treatment. Following Fabiano and Caserta (2018) who highlighted a lack of guidance on how best to

integrate multiple informant ratings in clinical settings, an examination from a clinical, community sample will be used to provide real-world measures of how caregivers respond on their ECBI measure over the course of treatment. The analyses used may provide a metric that can be used in clinical settings to spark conversations about parent agreement and disagreement in treatment planning and more thoughtfully integrate experiences of multiple caregivers into treatment.

D. Research Aims and Hypotheses

The following aims will be used to guide the current project in the investigation of caregiver concordance in the context of PCIT. Aim 1: Describe the extent to which caregivers agree or disagree on ECBI reports within the context of PCIT, and test if these differences change over the course of treatment. In line with previous research which shows concordance rates in the moderate range for externalizing problems (Stratis & Lecavalier, 2017), I hypothesize that concordance as measured by q-correlation will be moderate between caregivers. As PCIT emphasizes teaching caregivers to use the same parenting skills to address child behaviors, I hypothesize that levels of agreement between parents will increase over the course of treatment. Aim 2: Analyze the predictive effects of various parent and child characteristics on levels of concordance. I hypothesize that higher levels of parental stress may be associated with lower levels of concordance between caregivers. 2a: test these predictive effects on pre-treatment concordance. 2b: test these predictive effects on post-treatment concordance. 2c: test these predictive effects on change in concordance from pre- to post-treatment. Finally Aim 3: Explore whether concordance at post-treatment predicts distal outcomes (e.g., follow-up ECBI scores for primary caregiver). This final aim

will allow the study to establish evidence more firmly for caregiver agreement being domain-relevant information in the context of PCIT.

II. Literature Review

A. Children's Mental Health

Over the past few decades, the number of children and adolescents in the United States who meet criteria for a mental health diagnosis has increased at an alarming rate. In a given year, an estimated 13-20% of children under the age of 18 living in the U.S. meet criteria for a mental health disorder (Perou et al., 2013). Disruptive behavior disorders (DBDs), including conduct disorder and oppositional defiant disorder, are among the most common reasons for referral to services for children (Merikangas et al., 2009). Children who exhibit DBDs at a young age are also more likely to experience many negative long-term outcomes including mental health issues, substance use, and future abuse of women and children (Fergusson, Horwood, & Ridder, 2005; Prinz, Sanders, Shapiro, Whitaker, & Lutzker, 2009). Early onset conduct problems can result in tremendous detriment to the individual, the family, and society. Recent evidence suggests that rates among depression, anxiety, and disruptive behavior disorders, are all on the rise in the last 15-20 years (Ghandour, et al., 2019). If there has ever been a time to invest in children's mental health and understanding effective ways of providing prevention and early intervention, that time is now.

Numerous funding bodies and organizations have acknowledged the rising level of need and in turn, turned the attention of research and scholarship towards solving these well-documented community needs. This is in part due to the tremendous economic burden that childhood mental disorder places on the system which has been estimated at nearly \$250 billion annually (Perou et al., 2013; Torio et al., 2015; Eisenberg & Neighbors, 2007) within the U.S. alone. In response to widespread community need and associated consequences,

county and state mental health systems have implemented prevention and early intervention plans to fund children's mental health services on the front line using primarily evidence-based practices (EBPs; Hoagwood et al., 2014; Starin et al., 2014; Lau & Brookman-Frazee, 2015). Funding at state and federal levels has shifted in such a way that allows us to attend to these elevated needs of children and families from numerous angles. It remains clear that increasing access to effective services, particularly for those who are most vulnerable, is a problem that has yet to be thoroughly resolved. Future attempts to increase access to effective services will benefit from thorough examination of specific treatment models to examine the characteristics that predict increased engagement and retention for groups and individuals who continue to be left out of the treatment room. Regarding fathers in particular, this task will involve a thorough review of effective interventions for children's mental health disorders with a focus on how fathers engage with these services.

B. Behavioral Parent Training Programs (BPTs)

Behavioral parent training programs (BPTs) have been a gold-standard intervention in children's mental health over the last 30 years (Eyberg, Nelson & Stephen, & Boggs, 2008; Kaminski & Claussen, 2017). A recent chapter highlighting the vast research on parent training interventions summarizes findings from dozens of meta-analyses, which show that strength of evidence supporting BPTs ranges from middle-high levels for disruptive behavior disorders and ADHD (Long, Edwards, & Bellando, 2017). Further, on average, meta-analytic reviews found moderate effect sizes supporting the effectiveness of BPTs (Long, Edwards, & Bellando, 2017; Jent et al., 2017). While BPTs vary in their specific content, they generally include: 1) a primary focus on the caregiver as opposed to the child, 2) attending to prosocial behavior instead of fixating on antisocial behavior, 3) supporting

caregivers in identifying and recording child behavior, 4) focus on social learning principles (e.g., behavioral reinforcement) 5) didactics delivered to caregivers teaching positive parenting skills (e.g., praise, modeling, reflecting child verbalizations) and regular practice of these skills, and 6) discussion on how to generalize these skills outside of the clinic setting (McMahon & Forehand, 2001; Shaffer et al., 2001). Research investigating BPT program components that are most associated with positive outcomes found that teaching caregivers how to communicate about emotions, teaching caregivers positive parent-child interaction skills, and requiring regular practice outside of session were associated with higher levels of parent skill acquisition (Kaminski et al., 2008; CDC, 2009). Further, components most likely to reduce externalizing behaviors in children were teaching caregivers how to promote positive interactions with their child along with how to respond consistently to child behavior, including using an effective time-out sequence, and requiring regular practice outside of sessions (Kaminski et al., 2008; CDC, 2009). Some BPT models utilize group-based didactic trainings and multi-family practice settings (Lee et al., 2012), while other utilize in-vivo coaching directly to parents playing with their children behind a two-way mirror (Brinkmeyer & Eyberg, 2003).

Regardless of the format, these interventions tend to have a focus on reducing parent stress, increasing skill acquisition and generalization, and reducing overall levels of child misbehavior. These interventions became popular choices for therapists working in prevention settings with a wide range of parents and families. For example, BPTs have been employed in community settings to reduce levels of child maltreatment for welfare-involved parents (Michelson, Davenport, Dretzke, Barlow, & Day, 2013). These studies highlight that parenting programs allow parents to gain positive skills that help repair their relationships

with their children and to learn effective discipline strategies that can be alternatives to physical discipline. In terms of long-term treatment outcomes, many meta-analytic studies have found medium to large effect sizes at follow-up (Long et al., 2017), however, these findings vary widely and may depend on the specific intervention as some studies do show maintenance of treatment gains such as maternal self-efficacy and maternal stress (Tucker, Gross, Delaney, & Lapporte, 1998). Evidence supporting the use of BPTs includes research suggesting that children are most likely to benefit from mental health services when there is a parent actively and consistently involved in their treatment (Becker et al., 2017). Meta-analytic studies investigating BPT efficacy in various settings have continued to show a long-standing record of positive outcomes when delivering these interventions in community settings (Lanier et al., 2014), with racial/ethnic minority families (McCabe & Yeh, 2009), and to respond to a wide range of presenting problems (DBD, Lundahl et al., 2006; ADHD, Lee et al., 2012). Some evidence also suggests that modified versions of BPTs can be effective in treating children with ASD and other developmental disabilities (Scudder et al., 2019). The flexibility and long history of effectiveness of these interventions has allowed them to stand as primary options when delivering services to youth and families struggling with a wide range of symptoms.

C. Parent-Child Interaction Therapy

1. Overview of the Program

Among the BPTs that have communicated significant confidence in researchers and participants alike, a small number of programs stand out. In a recent chapter highlighting BPTs with the strongest evidence supporting their effectiveness and efficacy, parent-child

interaction therapy (PCIT) was among one of the three interventions highlighted for its decades of effectiveness research, strong effect sizes in a wide range of implementation settings, and wide-spread adoption and sustainment across the US (Long, Edwards, and Bellando, 2017). Developed as a manualized version of a behavioral parent training program, PCIT is based on Hanf's two-phase model of parent training (Hanf & Kling, 1973) in which the first phase of treatment involved repair of the parent-child relationship through positive parenting skills and the second phase of treatment offers structured discipline strategies that will increase child compliance and reduce child misbehavior. In PCIT, a didactic teach session is utilized at the beginning of each phase of treatment, where a therapist or team of co-therapists will provide didactic instruction to the parent(s) introducing positive parenting skills and soliciting questions about the ways in which the skills will apply to the family's specific context. Following the didactic session of each phase, sessions consist of structured check-ins, coding of parent skill use, coaching of parent skill use through bug-in-the-ear, and debriefing/check-out with the parent(s). The family will advance to the second phase of treatment (or graduate from the second phase), once specific mastery criteria are met which offer benchmarks for parental skill use as well as clinical cut-offs for parent-rated child behavior problems. While PCIT shares several core features with other BPTs, especially others that use the same two-phase model of theoretical foundation, it is also unique in a number of important ways.

First, the play-based format of PCIT and triadic model which places the therapist as a support to the parent who is the active change agent delivering the skills, offers ample opportunity for in-vivo practice, application, and coaching of the skill by the therapist to the parent. PCIT utilizes a one-way mirror behind which the therapist acts as a coach to the

parent who is engaging in real-world play with their child while actively applying the skills they are taught in the beginning of each phase of treatment. Studies have shown that the amount of time spent coaching parents is positively correlated with skill acquisition in PCIT (Barnett et al., 2017), suggesting this active coaching model allows parents to practice the skills and receive support in implementing them in real-time. While in-vivo coaching is utilized in other parent training programs (Shanley & Niec, 2010), the use of the one-way mirror is a unique component that allows the parent to truly stand out as the main change agent in the parent-child relationship.

Second, a marked feature of PCIT is the program's use of standard progress monitoring to inform clinical decision making and treatment planning. As noted above, PCIT relies heavily on weekly parent-report measures of child behavior (intensity and problem), and homework completion to determine if parents meet mastery to move from one phase of treatment to the next. Progress monitoring has also been indicated as an important feature of effective evidence-based services in children's mental health (Jenson-Doss et al., 2020). To make informed decision in PCIT, therapist utilize a 36-item measure known as the Eyberg Child Behavior Index (ECBI; Boggs, Eyberg, & Reynolds, 1990) which is a parent-report measure that is completed weekly and produces two scales (i.e., intensity and problem). In the context of the current study, the ECBI is of critical importance given its ability to allow for the comparison between caregiver ratings. The ECBI's two scales will allow comparison between caregivers across multiple factors that have been associated with treatment differences and has been examined for its psychometric properties in recent years (Rich & Eyberg, 2001).

2. Effectiveness Research

PCIT has decades of research backing its effectiveness in various treatment settings with wide ranges of family demographics. A recent meta-analytic review of 23 PCIT studies in a variety of settings found that, compared to control conditions, PCIT produced significant, robust decreases in parent-reported child externalizing behaviors and self-reported stress (Thomas et al., 2017). In fact, whole books have been published on PCIT, its effectiveness in a wide range of settings, and its utility in treating various presenting concerns (Brinkmeyer and Eyberg, 2003). Its popularity and robust outcomes have sparked a significant focus on adapting PCIT to even wider age groups and presenting concerns than it was originally intended. While initially developed to support parents with children experiencing behavior problems and using noneffective discipline techniques PCIT has been found to help eliminate disruptive behavior disorder symptomatology (Lieneman et al., 2017), adapted to include modules for use with specific child clinical presentations (e.g., PCIT-CALM for children with anxiety; Comer et al., 2018; PCIT-ED for children with emotion dysregulation challenges, Lenze et al., 2011), and proven effective with a wide range of racial/ethnic background families. For example, McCabe and colleagues have adapted PCIT to include culturally-specific values for Mexican-American families and found it to be effective within this community (2009). PCIT has also been adapted for culture to treat Puerto Rican children and families with positive results (Matos, Bauermeister, & Bernal, 2009). An adaptation made for slightly older children found the practice to be effective for children as old as 9 years old (Peer et al., 2017). Adaptations for presenting concern include PCIT-CALM (Comer et al., 2018), an adaptation for children with social anxiety, PCIT-ED (Lenze et al., 2011), a version which treats emotion

dysregulation in addition to the traditional focus on externalizing, disruptive behaviors, and PCIT-ASD, an adapted version for children on the autism spectrum which has shown preliminary effectiveness in recent studies (Scudder et al., 2019). The effectiveness of PCIT in various settings and its widespread adoption among community mental health systems across the country makes the intervention a suitable choice for studying community implementation of the intervention among multiple caregivers.

D. Other Caregivers

Over the last several decades, family structures are shifting such that the traditional ideas of the nuclear family are no longer as widely applicable (Cabrera et al., 2018; Cabrera et al., 2000; Schoppe-Sullivan & Fagan, 2020). For example, roughly 40% of children in the U.S. today are born to mothers who are unmarried (Osterman et al., 2023). In recent years, efforts to engage and study caregivers in a way that is inclusive and responsive have shown promise. For example, a culturally adapted version of PCIT for Mexican/Mexican American families highlighted the importance of engaging multiple generations of family members with caregiving responsibilities (e.g., *abuelos*/grandparents; McCabe et al., 2005). This same intervention has gone on to show effectiveness over several randomized trials where a wide range of caregivers were involved in treatment (McCabe et al., 2009; 2012). Future iterations of the intervention offer a more personalized approach to the family that allow for an integration of the caregiver's explanatory models of child behavior problems into treatment (Yeh et al., 2022). Other examples include parenting interventions with kinship/foster caregivers (Wu et al., 2020), non-resident parents (Perry & Langley, 2021; Caldwell et al., 2014), single parents (Chacko et al., 2009; DeGarmo & Jones, 2019), and overarching efforts to shift towards parenting interventions that promote co-parenting, an

inclusive outcome that can be supported regardless of family structure (Teti et al., 2017; Patterson, 2016). However, most efforts to engage a wider range of caregiver types in treatment have focused on father engagement, despite continued evidence that even when fathers are engaged in treatment studies, their data is often not collected (Gonzalez et al., 2023).

E. Fathers

1. The Impact of fathers on Children’s Development and Treatment Outcomes

More recently, fathers have been identified as valuable contributors both to treatment outcomes as well as family outcomes more generally. In fact, entire books have been written dedicated to the impact that the role of the father plays on child and family outcomes (Lamb, 2000; 2010; Cabrera & Tamis-LeMonda, 2012). In his introductory chapter on how fathers influence children’s development, Lamb states, “As far as influences on children are concerned, [...] very little about the gender of the parent seems to be distinctly important. The characteristics of the father as a parent rather than the characteristics of the father as a male adult appear to be most significant (2010, p. 5).” Research on the impact of sensitive fathering (i.e., scaffolding, teaching, encouraging) predicts positive outcomes both cognitively and emotionally in children’s development (Shannon, Tamis-LeMonda, London, & Cabrera, 2002). For children whose father is available, and particularly for children who are at risk for entering trajectories with negative long-term outcomes, having parents who support their needs in a sensitive manner can protect them from experiencing negative life course trajectories. Sensitivity and support from fathers have been associated with positive pro-social relationships and friendships in children and adolescents (Cabrera, Cook,

McFadden, & Bradley, 2012), and fathers who engage in complex play tend to raise children with superior language development as compared to fathers who engage in less complex play (Malin, Cabrera, & Rowe, 2014).

In terms of parenting interventions and PCIT, a series of notable studies are worth highlighting to articulate the current state of father engagement in children's mental health. In general, the impact of father engagement on intervention outcomes is similar to the findings from child development more broadly; when fathers engage in treatment in meaningful and substantial ways, the influence of their involvement can produce positive and lasting change for families. Grossman and colleagues (2002), for example, showed that increased paternal caregiving in family systems and quality of play was associated with increased executive functioning in children. A few years later, Feldman and colleagues (2007) found evidence that father-infant synchrony may be protective against maternal depression in families with pre-term infants. Further, a meta-analysis comparing research on BPTs found that studies including fathers in treatment, compared with those where the father was excluded, reported significantly more positive changes in both child behaviors and desirable parenting strategies (Lundahl et al., 2008). In a pivotal study of father involvement and PCIT, Bagner and Eyberg (2003) compared involved-father families (i.e., fathers that attended treatment), uninvolved-father families (i.e., families where a father did not attend treatment), and absent-father families (i.e., families where the father was not involved in the child's life). While each group of families significantly benefited from treatment on measures of child-behavior, parental depression, and parenting stress, and no group differences were found immediately after treatment, at 4-month follow up mothers from involved-father families were the only group to maintain treatment gains. In addition to

findings linking father engagement to immediate benefits, this study suggests that father involvement in treatment may also be related to the maintenance of treatment gains. With each passing decade, more research enhances our understanding of how and when father involvement in parenting and intervention is needed.

2. Lack of Father Engagement and Future Directions

Despite empirical evidence highlighting the positive impacts of father engagement in services and continued calls to include fathers in research studies and interventions that are intended to support families (Budd & O'Brien, 1982; Phares & Compas, 1992; Fabiano, 2007; Panter-Brick et al., 2014; Fabiano & Caserta, 2018), rates of father engagement in both research and practice remain relatively low. In a recent survey of providers delivering parenting services, only 17.2% of therapists reported that fathers often attend sessions for their child or family services (Tully et al., 2018). Improved rates in attendance of fathers could help maximize the number of children and families who benefit from the gains from mental health treatment in general and parenting programs specifically. To explain why these rates remain low in research and practice, Cabrera and colleagues (2018) posited a list of three main reasons why fathers are not being included: 1) distinguishing primary caregivers in terms of who spent more time with the child makes it “easier to exclude fathers from research” (p. 153), 2) the general belief (as rooted in social role theory) that fathers “do not engage in hands on parenting” (p. 153), and 3) parenting research has not caught up to the dramatic cultural shifts that have changed demographics of what a “typical” family looks like. The authors continue to suggest that a transformation is needed in the way that we think about fathers contributing to families and suggest that a family systems approach, where relationships are examined in context and in relation to how they impact individual dyads

and the family, should be employed in the next generation of parenting research.

Significantly, one of the primary suggestions from this piece states that novel forms of measurement may be needed to capture the impact that fathers have on family systems and child development (Cabrera et al., 2018). A primary solution to the problem at hand would seem to involve breaking away from the standard world of single caregiver report based on who is the primary caregiver to measure child symptoms, developmental milestones, and treatment outcomes. Instead, it may be possible to not just ask both parents who are involved in the child's life about their perspectives towards the outcome variable but measure the relationship between these ratings and perspectives as well. This way, we increase not only the engagement and buy-in that fathers have as active members of the treatment process, but we can compare ratings to understand how relationships in scores and perspectives may cycle back to inform treatment planning and future research.

In the same year that Cabrera and colleagues (2018) posed their explanations for why fathers were being left out of research and practice, despite long history of empirical evidence demonstrating their positive gains, Fabiano and Caserta (2018) highlighted a need for a focus on the inclusion, engagement, retention, and measurement of father-related outcomes in research that hopes to better understand fathers' unique roles in treatment. Similarly multidimensional in nature, Fabiano and Caserta posed a multifaceted approach to resolving longstanding historical differences in rates of father engagement in treatment. Inclusion refers to the science of increasing how fathers are invited to and included in the initial stages of developing or evaluating an intervention in clinical science. Engagement refers to the actions taken once a father is in the door for treatment. What strategies can be used to motivate fathers' engagement to be an active member contributing to treatment.

Fabiano and Caserta provide several novel treatment approaches including the use of BPT principles during in-vivo sports activities to engage fathers in treatment activities that may overcome cited barriers regarding stigma (Fabiano et al., 2009; Fabiano et al., 2012).

Retention refers to the degree to which fathers are being kept from dropping out of treatment or research prematurely and may involve novel strategies of finding ways to sustain engagement over the course of treatment. Finally, positive outcomes were stated as their own future direction for research on fathers in children's mental health.

The issue of outcomes directly echoes Cabrera's increased attention to measurement and stems from a long-standing history of difficulties assessing multiple reporters for a single child within the context of a family. Deciding on a primary caregiver for a report on child functioning is cleaner and more practical from both a researcher's and practitioner's point of view, but is it the most accurate? Does it capture the fullest story of what is going on with any given child or family? Cabrera and colleagues (2018) caution us to the reality that "embracing the paternal template to study parenting behaviors might be as ecologically invalid as embracing just the maternal template" (p. 154), and invite us to imagine more comprehensive ways of understanding how reports may relate to one another, while acknowledging that an important step towards rethinking measurement of family systems may involve thorough evaluations of how fathers report on measures that were primarily developed with mothers in mind. Fabiano and Caserta (2018) highlight a major methodological and clinical problem of handling multiple informant reports and draw our attention to the fact that "there are no clear professional guidelines that assist clinicians with managing discrepancies across ratings, determining which ratings to weight or emphasize in particular situations and how to effectively deal with missing or incomplete data" (p. 857).

In a recent investigation of therapist experiences engaging fathers in PCIT, providers themselves shared difficulties engaging fathers into treatment in part because of their differing experiences in caretaking responsibilities, which resulted in seeing the child behavior problems differently (Klein et al., 2022). These reports require further investigation to determine if fathers are experiencing their child behavior problems differently and if these differences between parental experiences of child behavior problems equate to information that is relevant in the context of treatment.

F. Multi-Informant Integration

These issues are further complicated by meta-analytic research that examines correlations of multiple informant reports to find that even when two observers are reporting on the same child at the same moment in time, ratings correlate anywhere from a low to moderate range with r values as low as .25 in some cases (De Los Reyes et al., 2015; De Los Reyes et al., 2019). In this same meta-analytic work, the existing methods of dealing with these discrepancies are outlined as analyzing shared variance or agreement between informants, aggregating data to one score, or choosing a primary informant and using their observation (De Los Reyes et al., 2019). More research is needed to understand how best to manage multiple informant responses in the context of PCIT and other BPTs. For example, while interrater analyses suggest the ECBI is valid for caregivers regardless of gender, a foundational study on the measure also found that mothers rate their child behavior problems as more frequent and severe than their male partners (Eisenstadt et al., 1994). Additional research has highlighted that despite efforts to include fathers in clinical services and research, little has been done by way of comparing outcomes for different caregivers (Tiano & McNeil, 2005), and that acceptability of intervention components varies by parent

gender (Tiano, Grate, & McNeil, 2013). Given the proposed directions from previous research and a review of existing models and theoretical considerations (Martel et al., 2017), it would seem appropriate to begin with an analysis of shared agreement among caregivers in the context of PCIT and the measures used to track treatment progress for this intervention.

1. Concordance as an existing model of multiple-informant integration

Several existing statistical models exist for dealing with multiple informant response integration in the context of children's mental health (see Martel et al., 2017; De los Reyes et al., 2023). While an extensive review of each of these models is outside the scope of this work, in review of the existing literature base, it is important to acknowledge that simply relying on a primary reporter is the status quo which is being reconsidered in the context of father engagement in children's mental health (Fabiano & Caserta, 2018; Cabrera et al., 2018). As stated previously, assuming we have a family where both biological parents are involved in treatment together, choosing the father's rating instead of the traditional method of choosing the mother's rating may prove just as problematic and still leaves researchers and practitioners at a loss for how to deal with informant discrepancies. Instead, we are posed with several methods that will allow us to understand to what extent two caregivers agree on specific ratings of their child's behavior. One model which has been applied in similar contexts is using measures of concordance between multiple informant reports.

Concordance is a technique that is used to measure latent agreement and disagreement between two informants on the same measure (Youngstrom et al., 2000). Analyses produce both standardized difference scores and q-correlations which can be interpreted together to inform the best approach for informant integration across each domain on which the analysis

is applied. Previous applications have found the analytic method to be useful in interpreting and suggesting best practices for specific measures in the context of children's mental health. Recently, concordance analyses in conjunction with multivariate analyses were used to understand agreement between parent and teacher ratings of children diagnoses with autism spectrum disorders (ASD; Dickson et al., 2018). This research found that agreement between parent and teacher ratings of child symptoms was moderate but varied depending on the subscale of measures used, and that higher child cognitive abilities scores, were associated with higher agreement between teacher and parent. This study provides a methodological approach to understand discrepancies in caregiver ratings of child behavior problems. It may be the case that agreement between mothers and fathers would be higher for certain areas of functioning within the measure used. It could also be possible that certain child or family characteristics (e.g., parental mental health, child age, child gender) would be associated with higher or lower levels of agreement or concordance.

Utilizing the same parent-report measure used in PCIT (i.e., the ECBI), another empirical example of concordance between caregivers and teachers for children with ASD found low but statistically significant agreement between caregiver and teacher ratings of child behavior intensity ($r = 0.27$). In addition to these primary findings, separate analyses also suggested that the differences were directly associated with the degree and type of child diagnoses in that children who had more diagnoses were less likely to generate caregiver-teacher concordance and agreement in behavior ratings (Stadnick et al., 2017). While utilizing two respondents who generally have lower concordance overall (Stratis & Lecavalier, 2017), this study offers an additional lens to interpret two caregiver reports on their own child. There may be further evidence to suggest that child characteristics such as

diagnosis or number of co-morbid diagnoses would be related to lower levels of agreement in a family system. Additional applications of concordance modeling include work regarding fidelity in community mental health implementation of EBPs (Dickson & Suhrheinrich, 2021), examinations of the influence of racial/ethnic variables on parent-, child-, and teacher- report of adolescent internalizing and externalizing problems (Lau et al., 2004), and development of conceptual models to be used in examining multiple informant discrepancies (De Los Reyes & Kazdin, 2005).

2. Defining domain-relevant information

In a recent special issue outlining over a decade of work to generate guidance for researchers and clinicians on the integration of information from multiple informants, De Los Reyes and Epkins (2023) outline several key concepts and advances that are relevant for the current study. While a thorough integration of the models and frameworks presented was not possible given the study context and timeline of the project, there are relevant concepts that informed the current study. For example, the key questions that these scholars are seeking to answer is whether integration of multiple informant information can tell us something unique above and beyond the information we might gather from a particular score. Previous literature has made drastic improvements in methodological and conceptual frameworks utilized to measure and test these questions empirically. One foundational concept is the idea of multi-informant integration generating domain-relevant information, which is defined as “data that inform our understanding of the very needs about which informants provide reports, and by extension, inform our ability to design services to meet client needs” (De Los Reyes et al., 2022, p. 3). De Los Reyes and colleagues (2013) proposed the Operations Triad Model which has three paths for interpreting information

from multiple informants: Converging Operations, where informants report consistent problems and agree on the degree of these problems; Diverging Operations, where disagreement between reports provides domain-relevant information that informs clinical needs of the child in treatment; and Compensating Operations, where disagreement represents measurement confounds as opposed to domain-relevant information.

The current study uses measures of agreement and disagreement to argue that in the case of two caregivers entering treatment for PCIT, the relationship between their scores may provide clinically relevant information that directly relates to child need. Other examples of this include a study from Lerner and colleagues (2017) reported that greater agreement between teachers and parents on child symptoms indicated greater clinical severity in a sample of children seeking autism services. Domain-relevant information in this case would be clinical severity (as measured through informant agreement). Another recent example highlighting domain-relevant information comes from Makol and colleagues (2019) whose findings suggest that discrepancies between parent and child ratings of internalizing symptoms may predict higher likelihood of hospitalization in youth. Parents who enter parent training seeking services for their child tend to experience high levels of stress (Heath et al., 2020; Solem et al., 2011). We also know that levels of parent stress have been previously shown to be associated with a wide range of child behavior problems, including the externalizing behaviors targeted by PCIT (Levac et al., 2008; Schleider et al., 2015). In our search for domain-relevant information in the context of PCIT, it is important to consider how parent stress may play a role in the levels of agreement or disagreement seen in child behavior ratings. For example, when caregivers enter treatment with high levels of stress are they less likely to agree on child behavior ratings? It is possible that caregiver

stress negatively impacts agreement of a caregiving system, or on the flip side that disagreement about a child's behavior is a source of stress within a relationship. These could be potential key targets for change in the context of behavioral parent training interventions. The search for domain-relevant information in the context of PCIT with multiple caregivers will involve careful consideration of parenting stress as it relates to the agreement or disagreement over the course of treatment. To date, no study has integrated both measures of concordance and parenting stress to advance the understanding of multi-informant integration within PCIT. Details on the methods used to accomplish these goals are outlined below.

III. Method

A. Study Context

The current study utilizes archival analyses of an existing PCIT treatment dataset collected over the course of the previous 5 years (2018-2022), with child and caregiver demographics as well as treatment outcome data from pre-, mid-, post-, and follow-up time points. The dataset was collected by the Mailman Center for Child Development, Department of Pediatrics, Miller School of Medicine at the University of Miami, and services were delivered to children and families living in the Miami-Dade County area of South Florida through grant-funded services. Families included in the dataset consented to the use of their clinical information in clinical research during the time of consent for treatment. All analyses were completed using SPSS Software V29. The final dataset included all families from 2018-2022 who completed treatment with more than one

caregiver. The final dataset included families who completed ratings of child behavior problems across pre-, mid-, and post-treatment.

B. Participants

As stated above, participants include families who received time-limited PCIT services through the Mailman Center for Child Development from 2018 to 2022 year. Participant families were included in the current study if their case information indicated that two caregivers participated in treatment, both caregivers completed treatment, and both caregivers completed reports of child behavior problems. Children range in age roughly from ages 2 to 7 years old and were in treatment for a wide range of behavior problems. Time-limited PCIT services were delivered over the course of approximately 18 weeks and included 5 CDI sessions and up to 11 PDI sessions with two teach sessions, one for each phase of treatment.

Over the course of several years of clinic data, there were a total of 153 families with two caregivers involved in treatment who received PCIT services. For Aim 1 and Aim 2, a subsample of families where both caregivers completed treatment (i.e., did not drop out) and had complete ECBI data at pre-, mid-, and post-treatment was used given the need to compare scores over the course of treatment. The final subsample for Aim 1 and Aim 2 consisted of 57 families. Of the 57 families included in the sample, the primary caregivers were predominately mothers ($n = 51, 89.5\%$) and the secondary caregiver were predominately fathers ($n = 49, 86.0\%$). However, there were several other family structures included in the sample. Fathers made up 7.0% of primary caregivers ($n = 4$) and other primary caregivers included an adoptive mother ($n = 1, 1.8\%$) and an aunt ($n = 1, 1.8\%$).

Mothers made up 8.8% of secondary caregivers (n = 5) and other secondary caregivers included an adoptive father (n = 1, 1.8%) and grandmothers (n = 2, 3.5%)

Primary caregivers were 38.07 years old on average (SD = 5.03) and secondary caregivers were 40.04 years old on average (SD = 6.62). The racial and ethnic demographic of the sample is comparable to other studies conducted at the University of Miami's medical center (Jent et al., 2021; Garcia et al., 2021) which recruits families from predominately Hispanic communities, representative of the Miami area at large. Primary (n = 35, 61.4%) and secondary (n = 40, 70.2%) caregivers were both predominately Hispanic (inclusive of various racial groups). Racially, a significant proportion of the sample identified as White (primary: n = 51, 89.5%; secondary: n = 47, 82.5%). A smaller group of caregivers identified as either American Indian/Alaska Native (secondary: n = 1, 1.8%), Asian (primary: n = 3, 5.3%; secondary: n = 1, 1.8%), Black/African American (secondary: n = 1, 1.8%), or Multiracial (primary: n = 3, 5.3%; secondary: n = 4, 7.0%). The sample was generally college educated with 47 primary caregivers (82.5%) and 40 secondary caregivers (70.2%) reporting having a bachelor's degree or higher.

Also typical of the Miami area, several families received treatment either entirely in Spanish or in a combination of English and Spanish (primary: n = 14, 24.6%; secondary: n = 13, 22.8%). Most caregivers received treatment in English only (primary: n = 43, 75.4%; secondary: n = 44, 77.2%). Children within the sample were 4.55 years old on average (SD = 1.46) and predominately male (n = 39, 68.4%). Similar to the parental demographics, children in the current study were predominately Hispanic (n = 37, 64.9%), and White (n = 48, 84.2%), with a smaller portion of children who were Asian (n = 1, 1.8%), Black/African

American (n = 1, 1.8%), or Multiracial (n = 7, 12.3%). A full breakdown of caregiver and family demographics can be found in Table 1.

C. Measures

1. Demographics Form

Demographic questions were collected using a standard intake measurement collected by the Mailman Center for Child Development. Questions included demographics variables regarding the child client age, gender, race/ethnicity, as well as school information. Caregiver information was collected regarding age, race/ethnicity, gender, and family income. Information was stored via REDCAP on secure servers through the University of Miami.

2. Eyberg Child Behavior Index (ECBI)

The Eyberg Child Behavior Index (ECBI; Eyberg & Pincus, 1999) is a 36-item parent-report measure of disruptive behavior in children. The ECBI Intensity scale collects parent reports on a 7-point scale for each item while the Problem score uses dichotomous (i.e., yes or no) scoring on each item. Problem scores are generated using the same items but by asking the parent if the behavior is a problem for that parent during the time of measurement. The clinical cut off for Intensity scores on the ECBI is at or above 132. Evidence suggests that the measure is reliable for both mothers and fathers in the context of PCIT delivery (Eisenstadt et al., 1994).

3. Parent Stress Index – Short Form (PSI-SF)

The Parent Stress Index – Short Form (PSI-SF; Abidin, 1995) is a 36-item parent self-report measure of which has been shown as a reliable measure of parent stress as it relates to their caregiving responsibilities. A total stress score is generated along with three subscale scores of Distress, Dysfunctional Interaction, and Dysfunctional Child. The PSI has shown reliability and validity in studies with mothers and fathers (Bagner & Eyberg, 2003).

D. Study Design and Data Analytic Plan

Concordance, as one of the main variables of interest, was calculated as standardized difference scores and q-correlation between caregiver ratings at each time point. The combination of these metrics has been supported in previous literature surrounding multiple informant integration (De los Reyes and Kazdin, 2005) and will provide complimentary measures of agreement and difference between scores which will help contextualize parental concordance. Difference scores are calculated by subtracting primary caregiver standardized scores from secondary caregiver standardized scores in which positive difference would indicate that primary caregivers rate a higher degree of problems than secondary caregivers and vice versa. Q-correlations) are complementary metrics used to bolster the concordance measure given that difference scores may not provide incrementally valuable data.

1. Aim 1: Describe the extent to which caregivers agree or disagree on ECBI reports within the context of PCIT, and test if these differences change over the course of treatment.

The first research aim was primarily descriptive and consisted of generating complimentary concordance metrics across multiple time points for both caregivers on their ECBI ratings for both Intensity and Problem scales. As described briefly above,

concordance was calculated by two complementary measures of agreement as described by Youngstrom and colleagues (2000). These measures of agreement were calculated separately for the Problem and Intensity scales. First, difference scores are generated by subtracting the ECBI t-score of the second caregiver from the t-score of the primary caregiver where a positive difference score would indicate that the primary caregiver reported higher ECBI scores than the secondary caregiver and vice versa. Difference scores of zero would indicate that the dyad agree exactly on the overall level of behavior Problem and/or Intensity. However, caregivers may agree on the overall level of Problem and/or Intensity without necessarily agreeing on any one item. For this reason, q-correlations, which are calculated as the Pearson correlation between sets of items completed by two individuals, is used to characterize the overall levels of agreement between dyads and provides information about the “shape and dispersion of the profile of item scores” (Youngstrom et al., 2000, p. 1041). Q-correlation is not sensitive to difference in levels of scores and provides complementary information about relationships between scores. Q-correlation and difference scores were calculated and plotted for Problem scale and Intensity scale at each time point (pre-, mid-, post-treatment, and follow-up). Paired t-tests were completed to examine differences on concordance indices between pre- and post-treatment.

2. Aim 2: Analyze the predictive effects that various parent and child characteristics may have on levels of concordance.

The second aim utilized multivariate statistics in the form of several linear regression models where child and caregiver variables (e.g., child age, child gender, caregiver stress levels, family income) were entered as covariates and regressed onto the dependent variable

of concordance as measured by difference scores. The following sub-aims will provide further explanation of each analysis.

a) Aim 2a: Test the predictive effects of parent and child characteristics on pre-treatment concordance.

For aim 2a a linear regression model included parent and child characteristics (e.g., child age, child gender, caregiver stress levels, family income) as covariates in a model that predicted concordance at intake as measured by difference score. These analyses allowed for the testing of predictive effects of certain characteristics on the initial concordance between caregivers.

b) Aim 2b: Test the predictive effects of parent and child characteristics on post-treatment concordance.

An identical regression model to the one specified above in Aim 2a was used to investigate whether the same set of predictors was significantly associated with concordance scores at post-treatment. These analyses allowed us to test for predictive effects of certain characteristics on the final concordance.

c) Aim 2c: Test the predictive effects of caregiver characteristics on the change in concordance from pre- to post-treatment.

Should the main effects of changes in concordance be significant, post-hoc analyses will investigate the possible identification of specific case characteristics (e.g., caregiver two attendance, caregiver homework completion rates) that may predict positive changes (i.e., higher levels of agreement) in concordance over time. This question was investigated using

linear regression model with the dependent variable specified as the change in concordance over time from pre- to post-treatment.

3. Aim 3: Explore whether concordance at post-treatment predicts distal outcomes (e.g., follow up ECBI scores for primary caregiver).

A final exploratory regression model was included to investigate if there are distal outcomes associated with post-treatment concordance. In other words, is concordance at post-treatment associated with any long-term positive treatment gains that we would see as signs of positive impacts of treatment. The clearest example of a distal outcome was to test whether concordance at post-treatment was predictive of any outcome measurement (e.g., primary caregiver ECBI scores) at follow-up. This analysis allowed the project to make inferences about the potential impact that concordance may have on long-term treatment gains and sustainment of positive outcomes. This was accomplished using a linear regression model where the DV was follow-up ECBI t-score from the primary caregiver, and the predictors were post-treatment concordance score, child age, child gender, and caregiver stress.

IV. Results

A. Aim 1: Describe the extent to which caregivers agree or disagree on ECBI reports within the context of PCIT, and test if these differences change over the course of treatment.

The primary aim of the study was investigated by creating descriptive profiles of ECBI scores for both parents over the course of treatment. Figure 1 depicts the mean ECBI t-scores for primary and secondary caregivers at intake (i.e., pre-treatment), mid-treatment,

and post-treatment for both ECBI subscales (i.e., Intensity, Problem). At intake, primary caregiver mean t-score was 62.54 (SD = 7.13) for Intensity score and 64.96 (SD = 7.44) for Problem score. For secondary caregivers at intake, the mean t-score was 60.19 (SD = 6.95) for Intensity score and 61.93 (SD = 8.88) for Problem score. At post-treatment these mean scores dropped to 46.89 (SD = 6.66) and 49.07 (SD = 7.19) for primary caregiver ECBI Intensity and Problem scores, respectively. Secondary caregivers' mean t-scores were 47.49 (SD = 7.25) and 49.07 (SD = 8.87) for post-treatment ECBI Intensity and Problem scores, respectively. While the general treatment effect as seen in the downward trend of ECBI Problem and Intensity scores for both caregivers is positive, the current study was interested primarily in the agreement or disagreement between these scores.

As described above, concordance was measured utilizing two complimentary metrics (i.e., difference scores and q-correlations). Figure 2 is a graphic depiction of the change in concordance as measured by difference scores over the course of treatment. These difference scores were calculated by subtracting primary caregiver raw ECBI scores for both Intensity and Problem scales from caregiver 2 scores with zero signifying perfect agreement. A positive difference score, as was the case for the pre-treatment Intensity difference score ($M = 2.35$, $SD = 9.06$) and pre-treatment Problem difference score ($M = 3.04$, $SD = 11.54$), highlights that primary caregivers rated higher child behavior problems than secondary caregivers at this time point. At mid-treatment Problem difference scores remained positive ($M = 2.25$, $SD = 10.48$) showing that primary caregivers continued to report higher rates of specific child behaviors being a problem for them when compared to secondary caregivers at this time point. Intensity difference scores at this time point, however, dropped close to zero with secondary caregivers on average rating slightly higher intensity of child behavior

problems than primary caregivers at mid-treatment ($M = -0.37$, $SD = 8.58$). Finally, at post-treatment mean scores were -0.60 ($SD = 7.48$) for Intensity difference score and exactly zero (i.e., perfect agreement; $SD = 9.89$) for Problem difference score.

Figure 3 depicts the complementary concordance metric of q-correlation (r) over the same three treatment time points where a higher correlation shows a stronger level of agreement between caregivers on average at that time point. As seen in the figure, q-correlation scores at intake were 0.17 and 0.01 for Intensity and Problem, respectively. At post-treatment, these same scores were 0.43 and 0.26 for Intensity and Problem, respectively. To test the change in these differences over time, a paired-samples t-test was conducted between the pre-treatment difference scores for both ECBI Intensity and Problem scores as compared to the post-treatment difference scores. T-test results highlighted that over the course of treatment, agreement between caregivers increased significantly for ECBI Intensity [$t(56) = 2.18$, $p = 0.17$]. In other words, difference scores for ECBI Intensity between pre- and post- treatment showed significant movement towards agreement for primary and secondary caregivers. Findings from the t-test of ECBI Problem difference scores showed that the comparison between pre- and post-treatment difference scores was trending towards significance [$t(56) = 1.52$, $p = 0.67$].

B. Aim 2: Analyze the predictive effects of various parent and child characteristics on levels of concordance.

1. Aim 2a: Test the predictive effects of parent and child characteristics on pre-treatment concordance.

A linear regression model was used to examine whether parent or child characteristics were associated with caregiver concordance as measured by difference scores at intake. Given the limited sample size, a select number of predictors were entered into the model including child age, child gender, household income, and caregiver stress at intake as measured by PSI total percentiles for both caregivers. Each variable was tested for its individual influence on concordance at intake controlling for all other variables. The results of this regression model are shown in Table 2 ($R^2 = 0.30$, $df = 34$, model significance = 0.051) and highlight that the only significant predictor of concordance at intake was secondary caregiver stress ($b = -0.59$, $SE = 0.09$, $p = 0.002$). The model suggests that for every point increase in overall stress of the secondary caregiver at intake, the concordance as measured by the difference scores on ECBI Intensity between primary and secondary caregivers decreased by .59 points. However, given that the overall model was only trending towards significance, these results should be interpreted with caution and observed as preliminary. No other predictors entered into the model were found to have a statistically significant impact on concordance at intake.

2. Aim 2b: Test the predictive effects of parent and child characteristics on post-treatment concordance.

An identical linear regression model was used to examine whether parent or child characteristics were associated with caregiver concordance as measured by difference scores at post-treatment. The same set of predictors were included in the second linear regression model including child age, child gender, household income, and caregiver stress at intake as measured by PSI total percentiles for both caregivers. Each variable was tested for its individual influence on concordance at intake controlling for all other variables. Table 3 displays the results of this regression model predicting concordance at post-treatment ($R^2 = 0.20$, $df = 34$, model significance = 0.245). As seen above, the only significant predictor of post-treatment concordance on ECBI Intensity was secondary caregiver stress at intake ($b = -0.37$, $SE = 0.07$, $p = 0.050$). No other predictors entered into the model had a statistically significant impact on post-treatment concordance. However, given that the model was not significant, these results should be interpreted with caution as there may be a more representative set of variables that are associated with predicted change in post-treatment concordance.

3. Aim 2c: Test the predictive effects of caregiver characteristics on the change in concordance from pre- to post-treatment.

A third linear regression was completed to predict the effect of caregiver characteristics on the change in concordance from pre- to post-treatment (Δ concordance, diff). Several secondary caregiver characteristics were entered into the model as predictors of change in concordance including the frequency of “do skills” and “don’t skills” at post-treatment, the CDI and PDI homework rates, and the coach session attendance rates. As seen in Table 4,

this regression had poor model fit ($R^2 = 0.055$, $df = 50$, model significance = 0.760) and explained approximately 5.5% of the variance in the outcome variable. The model was not statistically significant nor were the individual predictors significant predictors of change in concordance from pre- to post-treatment.

C. Aim 3: Explore whether concordance at post-treatment predicts distal outcomes (e.g., follow up ECBI scores for primary caregiver).

The final linear regression was completed to explore the potential impact of concordance on distal outcomes. In this case, the distal outcome variable is measured by caregiver 1 ECBI intensity t-score. Predictors entered into the model included the absolute value of post-treatment concordance, child age and gender, both caregiver PSI total stress percentiles, and household income. Table 5 displays the results of this regression model predicting primary caregiver ECBI Intensity t-score at follow-up for the ($R^2 = 0.298$, $df = 28$, model significance = 0.208). Results highlight that post-treatment concordance scores significantly predicted ECBI Intensity t-score at follow up such that as the difference scores increased (e.g., greater disagreement), ECBI Intensity t-score at follow up increased ($b = 0.47$, $SE = 0.31$, $p = 0.019$). No other variables entered into the final model were significant predictors of ECBI scores at follow-up.

V. Discussion

Despite several decades of progress developing, testing, and disseminating effective treatments for child behavior problems, the implementation of multi-informant integration in clinical decision for these interventions is still lacking (De Los Reyes et al., 2023; 2015). As the field of behavioral parent training moves to include more fathers and other caregivers

into treatment (Fabiano & Caserta, 2018; Gonzalez et al., 2023), it is critical that we make use of the evidence on multi-informant integration to enhance clinical outcomes. Several recent studies have highlighted various theoretical models (e.g., shared decision-making; Fitzpatrick, et al., 2023) and clinic-based evidence illustrating that the relationship between informant ratings can provide domain-relevant information, that is, information that is clinically relevant and indicative of a specific need above and beyond one individual's ratings (Lerner et al., 2017; Makol et al., 2019). The current study utilized secondary data analysis to determine whether there is domain-relevant information between primary and secondary caregiver reports of child behavior problems in the context of PCIT. The findings of this study seek to support clinicians and researchers in making the most of their clinical outcome data and enhancing care for children and families. Further, given that PCIT is an intervention that utilizes a standardized measure for routine outcome monitoring, this intervention is well-situated for research on multi-informant integration and for generating valuable clinical data from multiple caregivers. As we consider the results from the current study it is important to think about how they will benefit the implementation of clinical care by way of clinical decision making. The following sections will discuss the results from the current study with an emphasis on how the information may be leveraged and disseminated to improve clinical practice for children and families.

The primary aim of the current project was to first use complementary metrics to generate and graphically depict the extent to which caregivers agree or disagree on their ratings of child behavior problems. As seen in Figure 1, there was a general treatment effect such that for both primary and secondary caregivers, across both Problem and Intensity scales, ratings of child behavior problems decreased over the course of treatment. While this

is important in the context of treatment effectiveness, the subsequent figures emphasize the space between these rating scores. First, in Figure 2 we see the graphic depiction of difference scores over the course of treatment which were on average positive (i.e., primary caregivers rating higher behavior problem intensity and higher number of behaviors being a problem) at the pre-treatment time point and approached zero over time. This approach towards agreement was seen more starkly for Intensity scores than it was for Problem scores which corresponded with the findings that comparison between pre- and post-treatment difference scores were only significant for the Intensity scale. This may suggest that the ECBI Intensity scale is a more sensitive tool for measuring caregiver agreement or disagreement.

While this may have been expected given the fact that Intensity items are generated using a 7-point rating scale as opposed to dichotomous ratings (Eyberg & Pincus, 1999), it does contradict previous findings that both scales have similar psychometric properties for mothers and fathers (Eisenstadt et al., 1994). More importantly, this finding suggests that treatment may improve overall rates of agreement between caregivers for the Intensity of child behavior problems, but not an agreement about which behaviors are seen as problems by individual caregivers. However, given that the finding from current study was trending towards significance for the Problem score difference comparison over time, further research is warranted with larger samples to investigate the strength of this finding.

Another notable finding from the primary aim was the initial low rates of concordance as measured by q-correlation. Previous research suggests that mother-father dyads of children are among the respondents with the highest levels of observed concordance and agreement on child mental health symptoms with meta-analytic evidence estimating these levels of

agreement at .48 for internalizing concerns and .58 for externalizing concerns (De Los Reyes et al., 2015). Given that our baseline agreement levels (.01-.17) were indicative of low overall agreement as measured by q-correlation, this may suggest that families who enter treatment for child behavior problems are at particular risk for baseline levels of disagreement. Given historical reports of high parent stress levels in the context of parent training (Health et al., 2020), it would be reasonable to suspect that this stress may be related to a caregiving system's ability to see problems similarly. Also, if the levels of disagreement are related to clinical severity, it may be that there is a relationship between clinical severity and parenting stress. Perhaps parents who have children with higher needs are more stressed, leading them to have higher levels of disagreement. Previous research showing high levels of parenting stress among those enrolled in PCIT (Garcia et al., 2021) may partially explain higher levels of disagreement, however, further investigation is needed evaluating constructs such as co-parenting that may require specific attention in the context of parenting interventions such as PCIT. While this study provides preliminary evidence of domain-relevant information, more is needed to map these results onto latent constructs and test the impact of treatment on their change over time.

While the primary aim was to define whether agreement between caregivers changed over the course of treatment, the secondary aim was to investigate the influence of parent and child characteristics on that change. Secondary caregiver stress was the only significant predictor of pre- and post-treatment concordance of those entered into the model. While these findings should be interpreted with caution given the limited sample size and model fit characteristics, they highlight the relevant impact that individual caregiver characteristics can have on between caregiver constructs. In this case, secondary caregivers (i.e.,

predominately fathers) entering into treatment with high levels of overall parenting stress may negatively influence the degree to which both caregivers agree on child behavior ratings. Given that these participants were mostly fathers in the current study, it may be important to study the unique stressors that fathers face in the context of parenting interventions. While previous research has characterized provider experiences engaging fathers (Klein et al., 2022; Gonzalez et al., 2022), and conflict between father preferences and certain ways that parenting interventions are formatted (Pfitzner et al., 2015), further research on how father stress levels impact treatment outcomes may be warranted.

The fact that the impact of secondary caregiver was seen for both pre- and post-treatment suggests that the influence of this characteristics may be pervasive and worthy of specific assessment and intervention. Future implementation of PCIT with several caregivers may benefit from utilization of the “Caregiver Stress” modules from the PCIT manual (Eyberg & Funderburk, 2011). As more providers address ongoing changes in family structure (Teti et al., 2017) and increases in family stress because of COVID-19 (Garcia et al., 2021), thoughtful integration of these modules may be indicated for families where multiple caregivers are present. Utilizing existing modules may be preferred for providers in community settings who themselves often report high stress and burnout levels (Lau et al., 2018) given the fact that they can be seamlessly integrated into the intervention as planned. While the current study did not show that secondary caregiver homework or attendance rates significantly predicted overall changes in concordance from pre- to post-treatment, this may have been an artifact of the limited sample size. Further investigation is needed to understand the mechanisms of change that may already be addressing or improving overall concordance.

Aside from establishing a potential current baseline of concordance between multiple caregivers in the context of PCIT, the current study was interested in the potential impacts that caregiver agreement made an impact on distal treatment outcomes. If we know something about caregiver agreement on baseline measurement, could this tell us more about the family's risk for negative outcomes? Could concordance be related to the maintenance of treatment gains? The final regression model included in the current study sought to probe these questions by regressing several child and caregiver characteristics, including post-treatment concordance, onto the distal outcome of primary caregiver ECBI Intensity score. What we found suggested that among several predictors, only post-treatment concordance significantly predicted ECBI Intensity score at follow-up, highlighting that concordance may offer clinically important (i.e., domain-relevant) information about the maintenance of treatment gains. In our sample, as post-treatment difference scores increased, so did ECBI follow-up scores. Therefore, the process of participating in PCIT and gaining agreement in a child's behaviors could help predict maintenance in changes. This could help explain previous research, which has shown that when fathers are involved in treatment, families have improved maintenance of treatment gains (Bagner and Eyberg, 2003).

For clinicians conducting PCIT, this information could be crucial in responding to families at the time of termination. Once more robust information on caregiver concordance has been established, providers may be cued to suggest booster sessions to families with low levels of agreement on post-treatment outcomes measurement. Without adding additional measurement burden, we may be able to predict who might call back to the clinic for additional support just from looking at a relationship between two scores. Current examples

of booster sessions show that they can improve maintenance of specific skills in the context of parent training for foster parents (Van Camp et al., 2008) and that alone they can provide relative improvement in child aggression and concentration in a community sample (Tolan et al., 2009). Following a similar model within the context of PCIT may be indicated and utilizing evidence-based decision making can help these intervention efforts be targeted for families who need it most. It may also be the case that feedback to families can be provided at post-treatment about their risk for potential loss of treatment gains over time to encourage continued use of positive parenting skills learned throughout treatment.

A. Limitations

Despite the significance of certain findings, the current study does have several limitations. Most notably, the limited sample size of families with complete treatment data resulted in a reliance on difference scores as a primary measure of concordance as opposed to conducting more sophisticated statistical analyses which have been noted in recent research (Castagna & Waschbusch, 2023; Laird & De Los Reyes, 2013). While complimentary metrics of q -correlation offer some additional information, analyses such as polynomial regressions may be indicated in future studies with larger samples. Further, the inability to study families that dropped out of treatment due to limited completion of ECBI data did not allow for a comparison between groups or subsamples of the dataset. Finally, a significant percentage of families had caregivers with a graduate degree (63.2% of primary and 36.8% of secondary caregivers) and family income above \$100,000 (59.6%), suggesting that the generalizability of these findings to lower-income families with less privilege may be limited. While these limitations are notable, using these results as a basis for future

studies may continue to build evidence for domain-relevant information between caregivers who engage in PCIT for children with disruptive behaviors.

B. Conclusions

Efforts to improve children's mental health and behavioral parent training need systematic improvements to the ways in which multiple caregiver information is integrated into clinical practice. Clinical decision making can be improved through careful use of multi-informant integration, particularly when there are standards of baseline evidence that allow providers to understand how their families compare to standard norms. The current study provides an example of how to apply difference scores and concordance measurement to generate preliminary evidence of domain-relevant information in the context of PCIT. While the findings are limited by a small sample size, the current study provides new evidence on the low levels of caregiver agreement at intake, and evidence of that agreement improving over time. Caregiver stress was illuminated as a predictor of this concordance or agreement and should be further investigated in studies with larger samples. Finally, the predictive significance of concordance on distal outcomes such as follow-up scores shows that providers and researchers may benefit from comparison between caregiver scores, even when anticipated agreement is high. Overall, the current study provides a step in the direction towards understanding the relationship between multiple caregivers' ratings of child behavior problems in the context of behavioral parent training.

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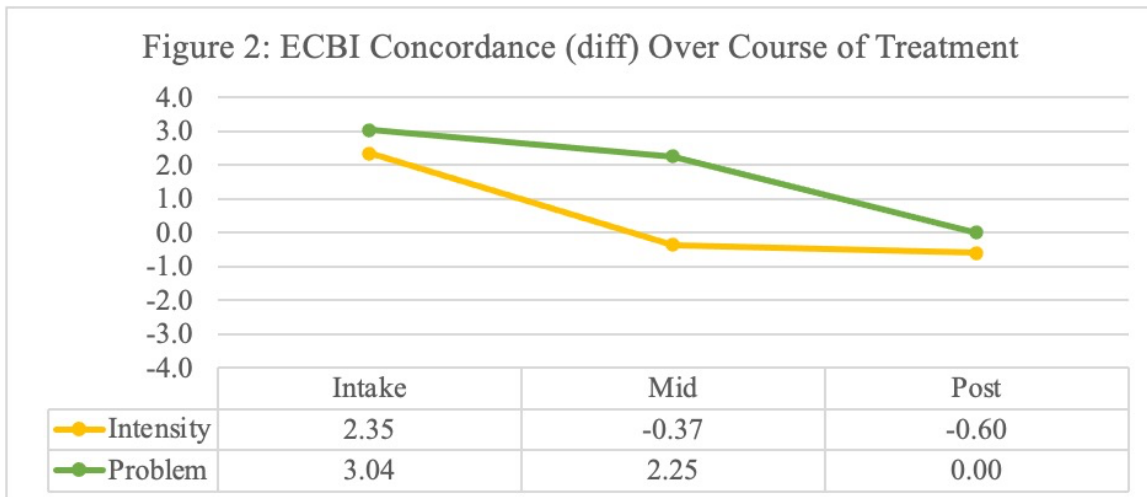
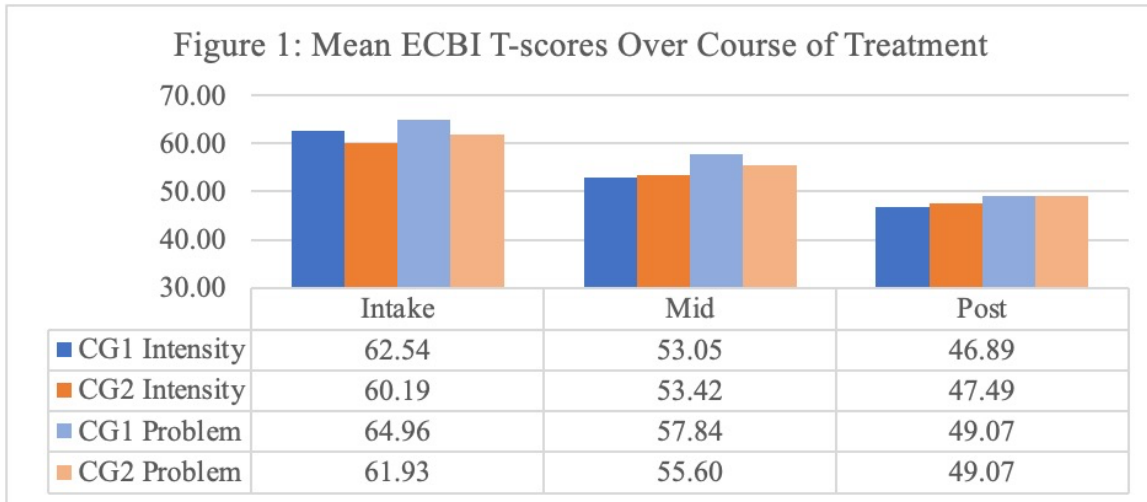
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Appendix

Table 1. Caregiver and family demographics for treatment completers with complete ECBI data (n=57)

<i>Variable</i>	<i>Frequency (%) OR M(SD)</i>	
	CG 1	CG 2
Relationship to child		
Mother	51 (89.5%)	5 (8.8%)
Father	4 (7.0%)	49 (86.0%)
Adoptive mother	1 (1.8%)	-
Adoptive father	-	1 (1.8%)
Aunt	1 (1.8%)	-
Grandmother	-	2 (3.5%)
Age	38.07 (5.03)	40.04 (6.62)
Ethnicity		
Hispanic	35 (61.4%)	40 (70.2%)
Other (e.g., Asian, Afro-Brazilian, Brazilian, Caucasian, Chinese, Greek, Jewish, Mix, Non-Hispanic, White)	22 (38.6%)	17 (29.8%)
Race		
American Indian or Alaska Native	-	1 (1.8%)
Asian	3 (5.3%)	1 (1.8%)
Black or African American	-	1 (1.8%)
White	51 (89.5%)	47 (82.5%)
Other (e.g., Hispanic, Latino, not sure)	-	3 (5.3%)
Multiracial	3 (5.3%)	4 (7.0%)
Highest level of education		
HS Diploma/GED	3 (5.3%)	7 (12.3%)
Some College	2 (3.5%)	5 (8.8%)
Associate's degree	5 (8.8%)	5 (8.8%)
Bachelor's degree	11 (19.3%)	19 (33.3%)
Graduate Degree	36 (63.2%)	21 (36.8%)
Language PCIT Delivered		
English	43 (75.4%)	44 (77.2%)
Spanish	10 (17.5%)	8 (14.0%)
English & Spanish	4 (7.0%)	5 (8.8%)
Child Age	4.55 (1.46)	
Child Gender		
Male	39 (68.4%)	
Female	18 (31.6%)	
Child Ethnicity		
Hispanic	37 (64.9%)	
Other (e.g., American, Asian, Brazilian, Mixture, Non-Hispanic, White)	20 (35.1%)	
Child Race		

Asian	1 (1.8%)
Black or African American	1 (1.8%)
White	48 (84.2%)
Multiracial	7 (12.3%)



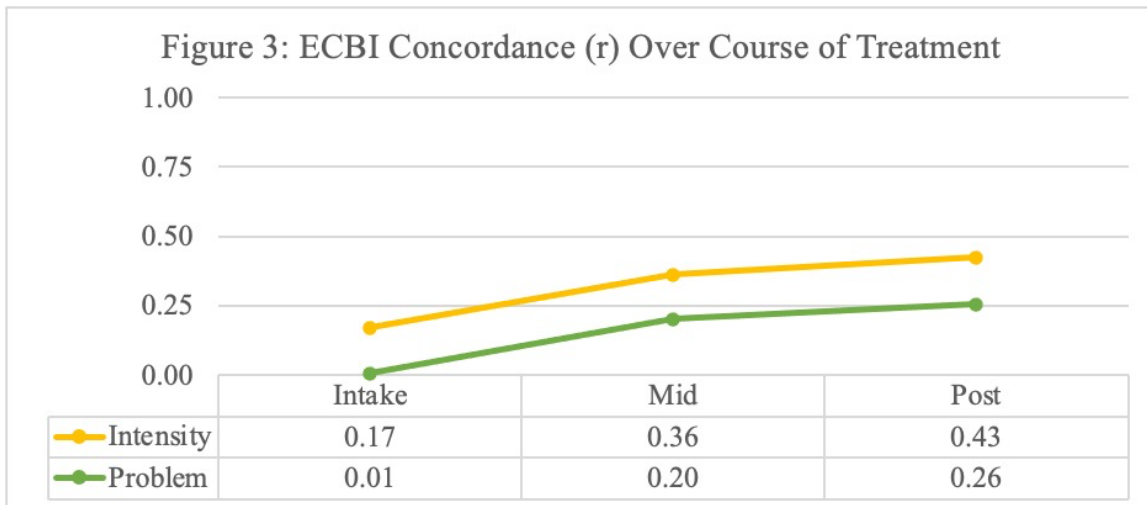


Table 2. Linear regression predicting concordance (diff) at pre-treatment

<i>Variable (Reference)</i>	<i>b</i>	<i>SE</i>	<i>p</i>
(Constant)	20.03	13.17	0.139
Child age	0.24	1.00	0.883
Child gender (male)	0.08	3.61	0.614
Caregiver 1 PSI, total stress percentile	0.24	0.10	0.182
Caregiver 2 PSI, total stress percentile	-0.59	0.09	0.002
Household Income	-0.06	1.01	0.685

Note: Model characteristics are as follows, $R^2 = 0.304$, total $df = 34$, model ANOVA significance = 0.051.

Table 3. Linear regression predicting concordance (diff) at post-treatment

<i>Variable (Reference)</i>	<i>b</i>	<i>SE</i>	<i>p</i>
(Constant)	15.11	10.18	0.148
Child age	0.24	0.78	0.173
Child gender (male)	-0.14	2.79	0.428
Caregiver 1 PSI, total stress percentile	-0.01	0.07	0.946
Caregiver 2 PSI, total stress percentile	-0.37	0.07	0.050
Household Income	-0.18	0.78	0.287

Note: Model characteristics are as follows, $R^2 = 0.197$, total $df = 34$, model ANOVA significance = 0.245.

Table 4. Linear regression predicting change in concordance from pre- to post-treatment (Δ diff)

<i>Variable (Reference)</i>	<i>b</i>	SE	p
(Constant)	2.47	11.50	0.831
Caregiver 2 ‘Do Skills’ at post-treatment	0.15	0.15	0.389
Caregiver 2 ‘Don’t Skills’ at post-treatment	0.06	0.20	0.769
Caregiver 2 CDI homework rate	0.04	0.09	0.843
Caregiver 2 PDI homework rate	0.24	0.08	0.209
Caregiver 2 coach session show rate	-0.17	0.14	0.418

Note: Model characteristics are as follows, $R^2 = 0.055$, total df = 50, model ANOVA significance = 0.760.

Table 5. Linear regression predicting primary caregiver ECBI Intensity t-score at follow-up

<i>Variable (Reference)</i>	<i>b</i>	SE	p
(Constant)	42.15	10.62	<0.001
Post-treatment concordance, diff, absolute value	0.47	0.31	0.019
Child age	0.05	0.89	0.789
Child gender (male)	0.04	3.36	0.860
Caregiver 1 PSI, total stress percentile	-0.21	0.08	0.332
Caregiver 2 PSI, total stress percentile	0.16	0.07	0.432
Household Income	-0.03	0.91	0.881

Note: Model characteristics are as follows, $R^2 = 0.298$, total df = 28, model ANOVA significance = 0.208.