THE CASCADING EFFECTS OF BEHAVIORAL PARENT TRAINING ON CAREGIVER DEPRESSIVE SYMPTOMS: AN EXAMINATION OF GENERALIZED TREATMENT EFFECTS AND POTENTIAL MODULATING MECHANISMS OF CHANGE IN LOW- INCOME FAMILIES

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ABSTRACT

MICHELLE GONZALEZ: The Cascading Effects of Behavioral Parent Training on Caregiver Depressive Symptoms: An Examination of Generalized Treatment Effects and Potential Modulating Mechanisms of Change in Low-Income Families
(Under the direction of Deborah J. Jones)

Preliminary evidence suggests that Behavioral Parent Training (BPT) for early onset disruptive behavior disorders (DBDs) may also alleviate caregiver depressive symptoms; however, less is known about the interrelationship of depressive symptoms and BPT skill use throughout the course of treatment. Accordingly, this study replicated and extended the literature by preliminarily examining caregiver depressive symptoms among low-income families (N = 13) of children with early onset DBDs who participated in either a standard course or technology-enhanced version of BPT. Findings suggested that BPT holds promise in reducing caregiver depressive symptoms. Specifically, data trends revealed reductions in depressive symptoms among caregivers who completed BPT. Although baseline caregiver depressive symptoms were not correlated with baseline use of BPT skills as predicted, evidenced emerged suggesting possible relationships between relationship enhancing skills (BPT skills learned in Phase I) and child compliance (BPT skills learned in Phase II) and caregiver depressive symptoms. Preliminary findings also provide support for caregiver-child relationship quality, caregiver warmth, and child defiance as potential mechanisms of change accounting for the cascading effect of BPT on caregiver depressive symptoms. Findings have important implications for guiding clinical judgment and treatment planning for families with this common constellation of symptoms.

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LIST OF ABBREVIATIONS

ADHD	Attention Deficit/Hyperactivity Disorder
BATD	Brief Behavioral Activation Treatment for Depression
BDI-II	Beck Depression Inventory – 2nd Edition
BPT	Behavioral Parent Training
CI	Clear Instructions
COPE	Communication Parent Training
DBDs	Disruptive Behavior Disorders
DC	Defiant Children
ECBI	Eyberg Child Behavior Inven
HNC	Helping the Noncompliant Child
IPI-A	Integrated Parenting Intervention for ADHD
IFIRS	Iowa Family Interaction Rating Scales
IY	Incredible Years
MDD	Mild Depressive Disorder
NC	North Carolina
PA	Post Assessment
PCIT	Parent Child Interactive Therapy
PMT	Parent Management Training
PSE	Parenting Self Efficacy
TE-HNC	Technology Enhanced Helping the Noncompliant Child
TO	Time out

Introduction

Early onset disruptive behavior disorders (DBDs) are among the most common reasons for the referral of young children (3 to 8) for mental health services (e.g., Egger & Angold, 2006; Lundahl, Risser, & Lovejoy, 2006; Zisser & Eyberg, 2010; also see Polanczyk, Salum, Sugaya, Caye & Rohde, 2015, for a review). Low-income families are more likely to have a child with an early onset DBD, including oppositional defiant disorder and conduct disorder, which co-occur with attention deficit/hyperactivity disorder, as well as psychopathology in other members of the family (Campbell, Shaw, & Gilliom, 2000; Shaw, Vondra, Hommerding, Keenan, & Dunn, 1994; see Shaw & Gross, 2008, for a review). Behavioral Parent Training (BPT), the standard of care for early onset DBDs, yields improvements in the parent-child relationship and, in turn, reduces not only child disruptive behaviors, including aggression, noncompliance, and oppositionality, but some work suggests improvement in caregiver depressive symptomatology as well (Chronis-Tuscano et al., 2013; Lees & Ronan, 2008; Timmer et al., 2011; also see Carpenter, Puliafico, Kurtz, Pincus, & Comer, 2014, for a review). Consistent with the National Institutes of Health's (NIH, 2015) stated priority of using interventions to target the "core mechanisms common across mental illnesses," this study aimed to replicate and extend prior work by examining the course of caregiver depressive symptoms among low-income families of children with early onset DBDs during the course of BPT, as well as how the practice elements characteristic of BPT programs may be linked to change (see Gonzalez & Jones, 2016, for a review). In preparation for these aims, the reader will be familiarized with an overview of BPT, as well as its theoretical underpinnings. Next, several lines of research will be reviewed and

integrated to inform a conceptual model for how caregiver involvement in BPT may have important, albeit unintended, positive side-effects for caregiver depressive symptoms. Third, the rationale for conducting this study with low-income families enrolled in a study comparing standard to technology-enhanced BPT will be provided. Fourth, research questions and study hypotheses will be outlined, followed by an explanation of methods, report of analytic results, and discussion of findings.

Behavioral Parenting Training: Overview and Theory

Within the DBDs literature, two types of developmental models have been identified: early childhood onset and adolescent or late-starting onset (e.g., Aguilar, Sroufe, Egeland, Carlson, 2000; Moffitt, 1993; Shaw & Gross, 2008). Growing interest in identifying the pathways that place young children in particular at risk for early onset DBDs has been motivated by findings from several studies comparing early versus late-starting youth with conduct problems (Moffitt, 1993; Patterson, Capaldi, & Bank 1991). Compared to youth who begin engaging in delinquent behavior in mid – to late adolescence, early-starters show a more persistent and chronic trajectory of behavioral problems extending from middle childhood to adulthood (Masi, Milone, Manfredi, Pari, Paziente, Millepiedi, 2008; Moffitt, 1993; Moffitt & Caspi, 2001). In addition, early-starters, who represent a relatively small percent (6 to 7%) of the population, are responsible for almost half of adolescent crimes and the majority (75%) of violent crimes (Offord, Boyle, & Raccine, 1991). Given the societal and relational implications, such as increased stress in family and peer relationships and economic costs associated with youth delinquency, later adult criminality, and secondary disorders such as substance abuse (e.g., Loeber & Stouthamer-Loeber, 1998; Reinke, Eddy, Dishion & Reid, 2012; Schaeffer et al.2006), great emphasis has been placed on intervening as early as possible with early-starter youth.

With the aim of understanding the development of DBDs, as well as the rationale underpinning treatment, the dominant conceptual understanding of the development of early onset disruptive behaviors is referred to as the early-starter model, also known as child-onset type (Moffitt et al., 2008), or the cascade model (Dodge, Greenberg, & Malone, 2009). Each of these models is characterized by the coercive cycle (see McMahon & Forehand, 2003, for a review), which is illustrated by the following example. A parent issues an instruction (e.g., "clean up the toys"), which the child responds to by whining, protesting, tantruming, or other noncompliance. In this scenario, the parent may acquiesce by rescinding the instruction, with the immediate goal of decreasing the averseness of the interaction (e.g., parent cleans up toys or moves on to next activity without making child clean up toys). Although such acquiescence may indeed alleviate both the child's and the parent's distress in the short-term, it is also true that the parent unintentionally, but quite effectively, reinforced the not okay behavior (e.g., whining, protesting, tantruming). In other words, the coercive cycle teaches the child that behaving in a defiant manner will eventually, if not immediately, result in the removal of an instruction or a parent's acquiescence. As a result, parents may increase harsh parenting practices (e.g., yelling, spanking) in an attempt to reassert their role as parent and achieve compliance, if only due to the child's fear, resulting in a coercive cycle between the parent and the child.

In addition to negative reinforcement processes characteristic of the coercive cycle, the development and maintenance of noncompliance can also be attributed to positive reinforcement processes. Indeed, the "positive reinforcement trap," a term coined by Wahler (1976), describes a pattern in which disruptive behaviors are reinforced when parents respond to such behaviors with attention (e.g., spending time with the child talking about "why" he or she is engaging in certain behaviors, before providing a consequence.). Although appropriately directed attention is

necessary for good parenting, giving attention to undesirable behaviors ultimately becomes a powerful motivator for young children to continue to engage in noncompliance and other disruptive behaviors (McMahon & Forehand, 2003).

Given the positive and negative reinforcement processes involved in the development of early onset DBDs, BPT was designed to both disrupt coercive cycles within the parent-child relationship (i.e., teaching parents more adaptive contingencies for their children's negative behaviors) and to prevent the "positive reinforcement trap" (i.e., teaching parents to attend to and reinforce positive rather than negative behaviors). Building upon formative behavioral research on the coercive cycle and related developmental, clinical, and behavior constructs, three groups in the United States initiated research that would come to be collectively referred to as Behavioral Parent Training (BPT; also called Parent Management Training or PMT) with the aim of disrupting the maladaptive pattern of parent-child interactions implicated in early onset behavior disorders: Gerald Patterson in the Department of Psychology at the University of Oregon (and later the Oregon Social Learning Center), Robert Wahler in the Department of Psychology at the University of Tennessee, and Constance Hanf at the University of Oregon Medical School (now the Oregon Health and Science University) (see Kaehler, Jacobs, & Jones, 2016; Patterson, 2005; Reitman & McMahon, 2013, for reviews). This review focuses on one BPT tradition, the Hanf-Model, given that it includes a range of programs with a common history and practice elements from which to gather examples: *Communication Parent Training (COPE*; Cunningham, Brember, & Boyle, 1995); *Defiant Children (DC*; Barkley, 1987; 1997); *Helping the Noncompliant Child (HNC*; McMahon & Forehand, 2003); *Incredible Years (IY*; Webster-Stratton, 2000); *Parent-Child Interaction Therapy (PCIT*; Hembree-Kigin & McNeil, 1995). Although Hanf Model programs do vary in some ways (e.g., *IY, COPE*, and *DC* were

primarily developed to be group-based, while *HNC* and *PCIT* were designed to be administered to individual families), at the core there is a collective focus on treating noncompliance and other disruptive and defiant behavior in young children, especially those of preschool and early elementary school age, as well as common elements of structure and skills taught to parents (Kaehler, Jacobs, & Jones, 2016; McMahon & Forehand, 2003; Reitman & McMahon, 2013). In addition to didactic instruction and discussion in BPT, therapists make extensive use of modeling of skills and parent role-plays during sessions to teach parents a set of skills that aim to 1) increase positive attention for appropriate child behavior (e.g., "Attends", "Rewards"), 2) remove caregiver attention for inappropriate child behavior (e.g., "Ignoring"), and 3) implement more effective instructions and consequences for noncompliance (e.g., "Clear Instruction Sequence"). In addition to in-session practice of skills, BPT programs collectively emphasize and incorporate home practice assignments and exercises.

Given the rich clinical and theoretical history that has informed development, it is perhaps not surprising that research findings support BPT, collectively demonstrating the largest effect sizes for the treatment of disruptive behaviors (see Chorpita et al., 2011; Dretzke et al., 2009; Eyberg, Nelson, & Boggd, 2008; Kaminiski, Valle, Filene, & Boyle, 2008; Lundahl et al., 2006; McCart, Priester, Davies, & Azen, 2006; McMahon, Wells, & Kotler, 2006; Serketich & Dumas, 1996 for reviews). As such, BPT has emerged as the gold standard treatment for early onset DBDs and remains the only evidence-based treatment for such disorders (e.g., Baydar, Reid, & Webster-Stratton, 2003; McCart, Priester, Davies, & Azen, 2006; Shaw, Dishion, Supplee, Gardner, & Arnds, 2006). Yet, in addition to efficacy for DBDs, research findings, although limited, suggest a promising but perhaps unintended side effect of BPT: alleviation of caregiver depressive symptoms as well. To more fully elucidate the link between caregiver

depressive symptoms and BPT both theoretically and empirically, this review will first consider the association between caregiver depression, parenting, and child externalizing problems.

Caregiver Depressive Symptoms, Parenting, and Child Externalizing Problems

A literature amassed over the past 35 years suggests that children and adolescents residing with a depressed caregiver are at a substantial risk for a variety of psychosocial adjustment difficulties from infancy through adulthood, including an increased risk for externalizing problems characteristic of DBDs (see Cummings & Davies, 1994; Downey & Coyne, 1990; Goodman & Gotlib, 1999, for reviews). In recent years, mechanisms of transmission of risk have been the focus of greater research attention, with deficits in parenting receiving substantial support as a likely mechanism. Research suggests that depressed individuals are typically more negative, critical, unresponsive, helpless, and passive toward others, including their children, resulting in parenting practices characterized by low levels of warmth and behavioral control and higher levels of unresponsiveness and hostility.

Low levels of warmth (e.g., lack of support or involvement), for example, may interfere with a child's capacity to modulate and regulate arousal (Tronick, 1989). A child may, as a result, be less capable of considering the consequences of his or her actions and refraining from problematic or disruptive behaviors (Brody, Dorsey, Forehand, & Armistead, 2002). Children who are socialized with hostility or unresponsiveness in their family interactions may be more likely to use similar techniques in interactions outside the family, further perpetuating their problem behaviors (e.g., Conger et al., 1994; Forehand & Wierson, 1993; Patterson et al., 1982). While higher levels of behavioral control may exert firm and consistent limits that foster self-regulation and compliance in children and adolescents, lax control and inconsistent monitoring may deprive children of valuable learning experiences necessary for the development of

emotional and behavioral control (Hart, Newell, & Olsen, 2003). Not surprisingly, these parenting practices (i.e., lower levels of warmth and behavioral control and higher levels of hostility and unresponsiveness) have been linked to the development and/or exacerbation of disruptive behavior problems in preschool and school age children (Goodman & Gotlib, 1999; Lovejoy, Graczyk, O'Hare, Newman, 2000; Renken, Egeland, Marvinney, Mangelsdorf, & Sroufe, 1989; Shaw, Keenan, & Vondra, 1994; Shaw et al., 2006). Despite this mounting body of evidence for the link between caregiver depression/depressive symptoms and deficits in parenting behaviors more broadly, it remains unknown *how* caregiver depressive symptoms affect (and are affected by) the specific BPT skills that are integral to treatment of theDBDs. *Therefore, the first aim of this dissertation was to examine the association between caregiver depressive symptoms and BPT skills at baseline to understand how depressive symptoms may be shaping the occurrence (or lack of) these skills at the beginning of treatment.* It was hypothesized that the presence of more depressive symptoms would be associated with lower frequency of BPT skills use at baseline. This has clinical implications as understanding the association between depressive symptoms and the use of BPT skills prior to treatment may help guide treatment planning.

In addition to being conceptualized as a risk factor for behavioral and emotional difficulties in youth, a growing body of literature is shedding light on the potential reciprocal models of child behavior and depressive symptoms in caregivers (Gross, Shaw, Moilanen, Dishion, & Wilson, 2008). Rather than consider parent effects on children and child effects on parents to be separate processes, reciprocal models of socialization regard parenting and child behaviors as recurrent, transactional exchanges over time, where both parties affect the other (Bell, 1968; Gross et al., 2008; Sameroff, 1995). Although there is an extensive body of research

on reciprocal effects between child disruptive behavior and parenting in general (e.g., Bell & Harper, 1977; Danforth, Barkley, & Stokes, 1991; Hummel, Kiel, Zvirblyte, 2015), researchers have paid substantially less attention to potential bidirectional effects between child disruptive behavior and parental mental health, such as depressive symptoms.

In fact, high rates of child behavior problems and irritability have been associated with the persistence and onset of maternal clinical depression (e.g., Ghodsian, Zajicek, & Wolkind, 1984; Murray, Stanley, Hooper, King, & Fiori- Cowley, 1996). Similar findings have been supported in experimental research, in which adults who interacted with defiant children showed more depressive symptoms than those who interacted with non-defiant children (Pelham et al., 1997). Finally, additional research has explicitly tested reciprocal models of child behavior and maternal depressive symptoms in a sample of low-income boys. For example, research by Gross and colleagues (Gross, Shaw, Burwell, & Nagin, 2009; Gross et al., 2008) reported significant child effects on subsequent maternal depression, which, in turn, were associated with subsequent externalizing problems in participating youth. If caregiver depressive symptomology leads to deficits in parenting that are associated with the emergence and/or maintenance of disruptive behaviors *and* disruptive behaviors help maintain, at least in part, caregiver depressive symptoms, then a cycle may develop. Accordingly, in this cycle, a caregiver experiencing depressive symptoms may engage in less optimal parenting practices that lead to child problem behaviors, which may partially maintain caregivers' depressive symptoms, then again, leading to and/or maintaining negative parenting practices and so on. Given that BPT directly targets two of these three constructs, notably parenting and child problem behaviors, BPT, may in fact, provide unintended alleviation of caregiver depressive symptomology as well. Indeed, promising yet limited research has found some support for improvement in caregiver depressive

symptomatology among caregivers engaged in BPT.

Preliminary Findings Linking BPT and Caregiver Depressive Symptoms

As highlighted above, BPT programs were not explicitly developed to target the comorbidity of depressive symptoms among caregivers and disruptive behaviors among their children, but building research suggests promise (see Gonzalez & Jones, 2016, for a review). For example, a study conducted by Timmer and colleagues (2011) investigated the efficacy of one of the aforementioned BPT programs, *Parent–Child Interaction Therapy (PCIT*; Hembree-Kigin & McNeil, 1995), in reducing children's behavior problems (i.e., clinical elevations on the Externalizing Subscale of the Child Behavior Checklist (CBCL; Achenbach, 2001) and clinical elevations on the Eyberg Child Behavior Inventory (ECBI; Eyberg, 1999) in families in which the primary caregiver attending sessions reported clinical levels of depressive symptoms [i.e., clinical elevations on two depressive symptom inventories: Symptom Checklist 90-R (SC-90R; Derogotis, 1994) and Brief Symptom Inventory (BSI; Derogotis, 1993)]. Results revealed significant pre- to post-treatment effects on the CBCL and ECBI for problem behaviors among children of depressed and non-depressed mothers. In addition, the majority (79.3%) of mothers at post-treatment moved from clinical elevations of depressive symptoms to normal ranges, yielding a significant pre- to post-treatment reduction in depressive symptoms for the depressed group.

Other work has compared BPT's effects on caregiver depression to other treatments that more explicitly are intended to target depressive symptomatology in the context of parenting. For example, Chronis-Tuscano and colleagues (2013) examined how BPT, in this case *Defiant Children (DC*; Barkley, 1997), produced changes in maternal depression from pre-to-post treatment with 98 mothers experiencing at least mild depressive symptoms evident by a minimal

score of 10 on the Beck Depressive Inventory-II (BDI-II; Beck, Steer, & Brown 1996). Mothers were then randomized to one of two treatment conditions: *Defiant Children (DC*; Barkley, 1997), or to *Integrated Parenting Intervention for ADHD* (*IPI-A*; Chronis-Tuscano & Clark, 2008), a cognitive behavioral treatment for depressed caregivers of children with ADHD, which included parenting components. In addition to self-report measures of depression, researchers also collected observational and parent-reported data regarding child disruptive behavior. While both *IPI-A* and *DC* produced small to moderate pre-to post- treatment effect sizes on maternal depressive symptoms and on both measures of child disruptive behavior, *DC* produced moderate to large effects sizes on positive parenting at follow-up, highlighting the potential for BPT to equally (or even more optimally), albeit indirectly, address caregiver depressive symptomology.

Lastly, researchers have examined the extent to which BPT may yield changes in parental mood among families who may be most vulnerable to both caregiver depression and child behavior problems, including low-income families. For example, a study conducted by Lees and Ronan (2008) assessed the effectiveness of *Incredible Years (IY*; Webster-Stratton, 2000), with a sample of low-income, single mothers. Mothers with a child between the ages of six and nine with a diagnosis of ADHD attended weekly group sessions for twenty weeks. At pre-treatment, families completed parent-report measures of family functioning, child behavior, parenting confidence, stress, and depression. These constructs were also assessed at post-treatment, and results showed an increase in family functioning and parenting confidence, as well as reductions in child behavior, stress, and notably maternal depressive symptoms.

In summary, preliminary findings suggest promise for the cascading effects of BPT for caregiver depressive symptoms. *Therefore, the second aim of this dissertation was to examine the patterns of change in caregiver depressive symptoms throughout the course of BPT*

treatment. It was predicted that depressive symptoms would generally decrease from pretreatment to post-treatment. These findings add more rich and detailed description of depressive symptoms throughout the course of BPT treatment to this emerging literature that aid in the flexible use BPT.

Although examining the course of depressive symptoms contributes further to this emerging literature, identifying the mechanisms by which BPT may be alleviating depressive symptoms among caregivers is equally important. Additionally, this dissertation aimed to extend and fill a vital gap, that is the identification of the potential processes by which the skills that parents are learning and using in BPT that manage child problem behavior may impact maternal depressive symptomology. Although the lack of attention to process may simply reflect the relative infancy of this work, the translation of the empirical literature into clinical practice depends on a more nuanced conceptual understanding of *how* BPT impacts caregiver mood, which in turn can be used to guide clinical judgment and treatment planning with families. Accordingly, the next section will provide a theoretically informed framework of the potential mechanisms by which the practice elements taught to parents in BPT may impact caregiver depressive symptomology as well.

Hypothesized Mechanisms by which BPT Shapes Caregiver Depressive Symptoms

Understanding the broader structure of BPT and its main objectives may lend itself to identifying the potential mechanisms by which BPT may be providing relief in depressive symptoms among caregivers (see Gonzalez & Jones, 2016 for a review). As alluded to in less detail earlier, BPT programs have two main objectives. The first objective, sometimes referred to as “differential attention” (McMahon & Forehand, 2003), involves teaching caregivers to increase positive attention for appropriate child behavior and remove caregiver attention for

inappropriate child behavior. During this phase of treatment, the primary goal is to disrupt the coercive cycle of interaction between the parent and child by establishing a positive and mutually reinforcing relationship. In BPT this is accomplished via the use of the parenting skills of "Attends" (i.e., running commentary of child's behavior parents wants to see or see more), "Rewards" (i.e., verbal and physical praise for behavior parents want to see or see more), and "Ignoring" [i.e., limiting parental attention ("no look, no talk, no touch") to behavior parent wants to see less]. The next phase of treatment involves implementing more effective instructions (i.e. "Clear Instruction Sequence") and consequences (i.e., "Time out") for noncompliance to improve child compliance. Given that there are two distinct, yet highly related, objectives inherent in BPT, there may be two processes accounting for changes in caregiver depressive symptoms.

The first hypothesized pathway by which BPT may help alleviate caregiver depressive symptomology is the use of the Phase I skills (e.g., "Attends," "Rewards," and "Ignoring"), which theoretically help to establish a more positive and mutually reinforcing relationship between caregiver and child. By using these relationship-enhancing skills (i.e., Phase I skills), caregivers may be tapping into elements of Behavioral Activation (see Dimidjian, Barrera, Martell, Munoz, & Lewinsohn, 2011 for review), an evidence-based treatment for depression. Broadly defined, behavioral activation is based on operant conditioning principles and suggests that depression results from a change in environmental context that alters the person's access to sources of positive reinforcement. For example, Brief Behavioral Activation Treatment for Depression (BATD; Lejuez, Hopko, & Hopko, 2001) focuses on activity monitoring and scheduling activities with a values-driven framework. Recipients of BATD are asked to (a) identify positive and negative reinforcers that maintain or strengthen depressive behavior and (b)

identifying positive reinforcers of high, personal value that maintain or strengthen healthy behavior across multiple life areas. If depressed caregivers of children with DBDs are experiencing some sort of transactional and reciprocal relationship between child conduct problems and maternal depressive symptoms, the resulting distressed parent-child relationship may reinforce caregiver depressive symptoms. Using the Differential Attention skills, characteristic of the first phase of treatment (e.g., "Attends," "Rewards," and "Ignoring"), may serve as a positive reinforcer as caregivers experience improvements in the parent-child relationship and, in turn, depressive symptoms may begin to lessen. Additionally, the coaching of BPT skills and praise from the therapist to the caregiver adds another opportunity for positive feedback that further reinforces the caregiver's use of BPT skills. Furthermore, the skills learned in the first phase of treatment, as stated above, were designed to promote a mutually reinforcing relationship between the caregiver and children and were not specifically designed to reduce defiant behavior; however, as children begin to engage in more prosocial behaviors through positive reinforcement, "not okay" behaviors tend to decrease (i.e., if children are spending more time engaging in "okay" behavior and being reinforced for those behaviors, then there is less motivation/time to engage in "not okay" behavior). *Given this pathway, the third aim of this study was to examine patterns of change for Phase I skills (referred to as relationship enhancing skills from this point forward) and the interrelationship of this trajectory with that of depressive symptoms.* It was expected that mastery and increase use of relationship enhancing skills (Attends, Rewards, and Ignoring), which focus on increasing child positive behavior through enhancement of the parent-child relationship, will coincide with changes in depressive symptoms among caregivers in Phase I. *The fourth aim of this study was to examine patterns of change among theoretically derived modulating mechanisms hypothesized to account for the*

interrelationship between relationship enhancing skills and depressive symptoms. Although the proposed study did not directly assess behavioral activation, mechanisms underlying behavioral activation were assessed, namely relationship quality between the caregiver and child and child defiance. In addition, caregiver warmth was examined as relationship enhancing skills may increase warmth which could have additional effects on caregiver mood. Specifically, it was expected that increases in warmth and relationship quality and decreases in defiance would complement decreases in depressive symptoms and increases in Phase I.

The second hypothesized mechanism by which BPT may ameliorate depressive symptoms among caregivers is through improvements in child compliance. As noted above, high rates of child behavior problems and irritability have been associated with the persistence and onset of maternal clinical depression (e.g., Ghodsian, Zajicek, & Wolkind, 1984; Murray, Stanley, Hooper, King, & Fiori- Cowley, 1996). Therefore, by improving child behavior problems, alleviation of depressive symptoms may follow. Enhancing the theoretical support between caregiver depression and child compliance is the Parenting Self Efficacy (PSE) literature (see Jones & Prinz, 2005 for a review). Defined as the "beliefs a parent holds of their capabilities to organize and execute the tasks related to parenting a child" (de Montigny & Lacharite, 2005, p. 390), it is rooted in general self-efficacy theory (Bandura, 1977) and has been linked with a range of important parental and child outcomes, notably parental depression and youth conduct problems (e.g., Campbell et al., 2000; Coleman & Karraker, 2003; Shaw & Gross, 2008). For example, Coleman & Karraker (2003) found that 2-year-old children's observed compliance, negativity, and avoidance of caregiver was associated with concurrent ratings of PSE, while higher levels of PSE were associated with less emotionally reactive and more sociable behavior. Furthermore, mothers of clinically referred, 2- to 8-year-old children with

conduct problems reported lower levels of PSE than a comparative community sample (Sanders & Woolley, 2005). Caregiver depression has been found to be associated with low PSE, such that greater depressive symptoms were associated with lower levels of PSE (Bor & Sanders, 2004; Haslam, Pakenham, & Smith, 2006; Teti & Gelfand, 1991; Zayas, Jankowski, McKee, 2005). Given that the hallmarks of depression are feelings of helplessness and worthlessness it is not surprising that caregiver depression and low caregiver PSE are related.

Rather than direct causal pathways between PSE and parental depression or between PSE and child conduct problems, a dynamic and transactional relationship between parent and child variables is likely to be a more accurate depiction of the relationship among these variables (Jones & Prinz, 2005). For example, coping with a difficult child may lead to a gradual erosion of PSE; but low PSE may also mean that the parent is less likely to use positive parenting and is more likely to give up, make internal attributions for failure, and experience anxiety and/or depression in response to challenging situations (Bandura, 1982). In turn, the child may be more likely to respond in 'difficult' ways (e.g. tantrum more, attempt to get more attention, become more noncompliant, etc.) (Beck, 1995). BPT, which targets parenting behaviors to increase child compliance, may lead to increased PSE among caregivers and, in turn, alleviate parental depressive symptoms. Parents who feel more confident in their ability to parent and control their child may begin to feel less helpless and make more positive attributions about their ability to parent and overall self-concept as a parent. Although the proposed study did not include measures to parenting self-efficacy, it is proposed that this construct can be assessed indirectly by assessing child compliance. *Therefore, the fifth aim of the present study was to examine the interrelationship of the trajectories of caregiver Phase II skill mastery and child compliance*. It was predicted that increased child compliance, would parallel changes in caregiverdepressive

symptoms in Phase II (Compliance Training). *In addition, the sixth aim of the present study also examined the variables of caregiver-child relationship quality, child defiance, and caregiver warmth during Phase II for the following reasons*: 1) Caregiver use of Phase I skills and Phase II skills may effect caregiver-child relationship quality, child defiance, and caregiver warm and, in turn, coincide with changes in depressive symptoms seen in Phase II and 2) Child compliance and child defiance reflect different constructs, such that defiance may capture additional behaviors such as whining, yelling, screaming, etc. that the child may engage in outside of the parent issuing a clear instruction, which would not be reflected in the child compliance calculation which is contingent upon the issuance of clear instructions (see Methods section). *The sixth aim of the present study, therefore extended Aim 4 and predicted that increases in warmth and relationship quality and decreases in defiance would complement decreases in depressive symptoms and increases in Phase II.*

Examining BPT and Caregiver Depressive Symptoms in Low-Income Families

As alluded to earlier (Lees & Ronan, 2008), low-income families are more likely to have a child with an early onset DBD, as well as psychopathology in other members of the family, including caregiver depression (see Conger & Donnellan, 2007; Dekovic et al., 2011; Goodman & Gotlib, 1999; Jones et al., 2013; Lundahl et al., 2006; Piquero, Farrington, Welsh, Tremblay, & Jennings, 2009, for reviews). Consistent with the Family Economic Stress Model (see Conger & Donnellan, 2007, for a review), chronic economic disadvantage leads to daily struggles that contribute to economic pressure (e.g., worrying about making ends meet, difficulty in dealing with stressful economic conditions), which in turn affect parental mental health (e.g., depressive symptoms) and subsequent parenting behavior. Accordingly, it is not surprising that low-income caregivers are more vulnerable to 1) develop depressive symptoms and 2) engage in the coercive

cycle of parent–child interaction implicated in the development and exacerbation of DBDs and, in turn, more likely to have a child with an early onset DBD than relatively higher income families (see Dekovic et al., 2011; Jones et al., 2013; Lundahl et al., 2006; Piquero, Farrington, Welsh, Tremblay, & Jennings, 2009, for reviews).

Importantly, data suggest that if low-income families are successfully engaged in BPT services, they benefit as much, if not more, than relatively higher income families, particularly at post-treatment and when the problem behaviors are in the clinical range (see Dekovic et al., 2011; Leijten, Raaijmakers, de Castro, & Matthys, 2013; Reyno & McGrath, 2006, for reviews). Given that low-income families may be more likely to evidence this constellation of symptoms (i.e., caregiver depressive symptoms and child conduct problems), but may not have the financial means to seek simultaneous treatments, examining the potential cascading effect of BPT to treat a multiple constellation of symptoms within low-income families may be of particular relevance.

The Use of Technology, BPT, and Caregiver Depressive symptoms

In addition to utilizing a low-income sample, the present study examined data collected for a randomized control trial that compared a traditional BPT program, *HNC* (McMahon & Forehand, 2003) to a technology-enhanced version of *HNC* (*TE-HNC*; Jones et al., 2014). In recent years, there has been a paradigm shift in the delivery of clinical services to include technology as a method of increasing engagement among hard to reach clients (see Aguilera & Muench, 2012; Comer, 2015; Jones et al., 2013; Kazdin & Blasé, 2011 for reviews), with promise regarding the efficacy of such an approach (e.g., Jones et al., 2014; Whittaker et al., 2012). Given that the rationale for using technology with families of children with DBDs is, in part, grounded in the potential for technology to enhance the relationship and perceived support between the caregiver and therapist and, in turn, enhance caregivers' sense of competence and

autonomy using the BPT skills (Deci & Ryan, 1985; Deci & Ryan, 2002; Ryan & Deci, 2000; Jones et al., 2014), it is plausible that the technology-enhanced treatment group may experience additional reductions (and/or earlier reductions) in caregiver depressive symptoms. Given the small sample size of the present study and the descriptive nature of analyses, the present study examined trends with collapse treatment groups.

Methods

Overview

As noted previously, the proposed hypotheses were examined via secondary analyses of a pilot study comparing one example of a standard BPT program (*HNC*; McMahon & Forehand, 2003) to *Technology-Enhanced Helping the Noncompliant Child* (*TE-HNC*) (Jones et al., 2014). Families were included in the project in they met criteria for "low-income" (i.e., adjusted gross income did not exceed 150% of the federal poverty guidelines, which takes into account both income and number of residents in the home), they had a child in the 3- to 8-year-old age range age (range for which HNC was developed and tested), and the child exhibited disruptive behaviors in the clinical range as evidenced by meeting or exceeding clinical cutoffs on the caregiver-report of the Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999) Severity or Intensity Subscales. Exclusion criteria were (a) child developmental or physical disability that precluded use of HNC skills; (b) caregiver current diagnosis of substance abuse/dependence, severe depression, or psychotic disorder; and/or (c) family involvement with Department of Social Services related to abuse/ neglect. Families in north central North Carolina (NC) were recruited via (a) advertisements targeting areas, work places, and retail outlets with an overrepresentation of low-income parents; (b) healthcare, social service, and other agencies that serve low-income families; (c) local schools; and (d) worth-of-mouth community agencies. Using restricted random assignment to force equal sample sizes, Masters-level therapists randomized interested and eligible families to *HNC* (n = 11) or *TE-HNC (*n = 11).

Of the 22 randomized families, three served as practice cases for each of the three project therapists, 4 families did not complete treatment, and 2 families had missing video session data for all sessions attended, resulting in 13 families for these analyses (*HNC* = 7; *TE-HNC* = 6). Caregivers were 87% female, 33% married or in a long-term relationship, and on average 37 years old (SD = 8.81). 62% of caregivers were Caucasian, 23% were African American, 8% were Latino, and 7% were multiracial. Approximately half (53%) of youth in were male (M = 5.67 years old, SD = 1.72).

Procedures

Interested families contacted a project staff member who conducted a brief phone screen for key eligibility criteria (i.e., 3 to 8 y.o. child, externalizing problems, lower income, coparent, etc.). If caregivers were eligible and interested, caregiver-child dyads were scheduled for a more extensive Screen/Baseline Assessment at the UNC Department of Psychology Community Research Center and Clinic to confirm eligibility criteria and to gather more detailed information on the participating caregiver and child. Following Screen/Baseline Assessment, if caregivers were eligible, each caregiver-child dyad was randomized to Standard (*HNC*) or Technology-Enhanced HNC (*TE-HNC*) Program and informed consent was obtained from the caregiver for his/her and the child's participation. The procedures at post-assessment were similar to baseline assessment procedures with few exceptions (e.g., consent). Caregiver-child dyads were compensated $50 per assessment for their participation. In addition, youth in the *TE-HNC* group received a $100 safe return bonus when the smartphone was returned at the post-assessment.

<u>*HNC* and *TE-HNC* Program:</u>

As briefly described earlier, *HNC* is a manualized program designed to be delivered to individual families to teach effective behavioral child management strategies to caregivers with children who are engaging in oppositional defiant behavior (or related problem behavior/disorders). On average, the program lasted 8 to 12 sessions, with families moving through the program at an individualized pace based on demonstration of their mastery of each skill via behavioral criteria before progressing to the subsequent skill.

Caregivers first learned to identify age-appropriate problematic and adaptive child behaviors. Then, the *HNC* program progressed in two phases: Differential Attention (Phase I) and Compliance Training (Phase II). Within each phase, a series of parenting skills was taught in a sequential manner. In Phase I, the Differential Attention Phase, caregivers learned to increase the frequency and range of social attention to the child and to reduce the frequency of competing verbal behavior. A primary goal of this phase was to break out of the coercive cycle of interaction between the parent and child by establishing a positive and mutually reinforcing relationship. In the context of the "Child's Game", a child-directed caregiver-child activity, the caregiver is taught the following three skills: to increase the frequency and range of positive attention to the child; to eliminate commands, questions, and criticism associated with inappropriate child behavior; and to ignore minor inappropriate child behavior.

In Phase II, Compliance Training, caregivers were taught the difference between unclear and clear instructions and how to give clear instruction sequences when issuing commands to the child as well as a non-physical punishment procedure, timeout, for occasions of child noncompliance. Phase II Skills were taught within the context of the "Parent's Game", a parent-directed parent-child activity. Progression to each new skill was determined by the use of specific behavioral criteria, which the therapist collects via observational coding ofthe

caregiver-child dyad during the initial part of each intervention session. Accordingly, the specific parenting skills built upon one another, and behavioral criteria ensured that caregivers mastered one skill before proceeding to the next skill.

Each skill was taught using the following procedures: explain the skill to the caregiver; model the skill; have the caregiver role play the skill with the therapist, who plays the role of the child; have the caregiver practice with the child and receive feedback form the therapist; provide the caregiver with handouts which review the skills; and assign the caregiver daily homework to practice the skills at home.

Families were scheduled to attend weekly sessions until they graduated through the skills and child behavior problems declined. In addition, therapists conducted mid-week calls to check-in regarding skills practice, to reinforce caregivers for practice, and to problem solve any problems with practice or child behavior.

The *TE-HNC* Program consisted of the Standard *HNC* program enhanced by several smartphone-technology components: (1). Daily assessments of skills practices which guided mid-week calls and sessions; (2). Video record in-home practice sessions for therapist review and feedback; (3). Daily reminders regarding skill practices, as well as reinforcing messages regarding progress; (4). Video calls with the family midweek to problem solve obstacles to skill practice and progress; and (5). Skills videos series to model new parenting skills.

Measures

Demographic information. Caregivers completed a demographic measure that included questions about themselves (e.g., age, education, race), their child (e.g., child age, gender, race), and their families (e.g., household income).

Caregiver Depressive Symptoms. For the present study, caregiver depressive symptoms, the primary variable of interest in the study, was assessed via self-report (Aim 1) and observational data (Aims 1, 2, 3, 4, 5, and 6). The self-report measure included the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996), which consisted of 21 items that assessed cognitive–affective and somatic depressive symptoms of depression during the past 2 weeks. Each item contained four statements reflecting varying degrees of symptom severity with corresponding scores ranging from 0 to 3 (e.g., I do not feel sad, I feel sad some of the time, I am sad all of the time, I am so sad or unhappy that I can't stand it). The total score was the sum of all responses, which can range from 0 to 63 with total scores ranging from: 0 to 13 represent "Minimal" depression; 14 to 19 represent "Mild" depression; 20 to 28 are considered "Moderate" depression; and 29 to 63 are considered "Severe" depression. The BDI-II has been validated with several populations including healthy adults (Dozois et al., 1998), primary care patients (Arnau et al., 2001), and people with Major Depressive Disorder (MDD) (Steer et al., 1998; Steer et al., 1999). All caregivers completed the BDI-II at the baseline assessment and at the post assessment. The Cronbach's alpha coefficient for the BDI-II in the current sample is .84.

In addition to the BDI-II, this study also used video recordings of weekly family sessions to further describe variability in caregiver depressive symptomatology using the Sadness Scale from the Iowa Family Interaction Rating Scales, 5th edition, (IFIRS; Melby et al., 1998). The IFIRS is designed to measure behavioral characteristics of individuals and the quality of behavioral exchanges between group members occurring in interaction settings of two, three, or four people. The scales are intended to tap both verbal and nonverbal behaviors, as well as affective and contextual dimensions of interaction.

The Sadness Scale captured the extent to which the person's behavior communicates

emotional distress that is conveyed as sadness, unhappiness, despondency, depression, and regret. Verbal behavior, such as speaking in a low, slow tone, becoming tearful, or verbally expressing sadness, and nonverbal behavior, such as withdrawal and dysphoria, are considered when coding using the Sadness Scale. For each therapy session, the Sadness Scale was used to code for caregiver depressive symptoms, specifically during the session skill practices (e.g., Child's Game in Phase I and Parent's Game in Phase II) that occurred at the beginning of session. In accordance with the IFIRS system, the scheme that was used in determining the appropriate code level for the Sadness scale is based on a 1 (not at all characteristic) to 9 (mainly characteristic) scale. Caregivers were assigned scores at the end of each 5- to 10-minute skill practices. Coders were blind to participants' depressive symptoms on the BDI-II gathered at the baseline assessment.

Although the Sadness Scale may not capture all of the different depressive symptoms measured in the BDI-II (e.g., loss of interest in sex, changes in appetite, changes in sleep, etc.), it is nonetheless a valuable measure as it captures depressive symptoms that are being expressed and conveyed to the child. The behavioral expression of depressive symptoms is particularly relevant in the context of this study given the interest in understanding the relationship between depressive symptoms, utilization of BPT skills, caregiver-child relationship quality, child defiance, and caregiver warmth. For example, a caregiver's affect may have more impact on the ways in which the caregiver uses BPT skills and relates to his/her child than whether the caregiver has lost interest in sex.

Child Defiance. For the present study, child defiance was assessed by the Defiance Scale from the Iowa Family Interaction Rating Scales, 5th edition, (IFIRS; Melby et al., 1998). This scale measures the extent to which the child actively disobeys or ignores the parent. Children

scoring high on Defiance avoid directives from parents and actively engage in activities contrary to the requests of parents. This scale also considers 1) nonverbal communication, such as facial expression and body posture; 2) emotional expression, such as inappropriate laughter, yelling, angry or irritable responses; and 3) the content of statements themselves (e.g., "No! No!"). Overall, rating capture the extent to which the child actively disobeys, ignores, and resists parent's requests, particularly when reminded. Child defiance using the Defiance Scale was coded during session skill practices (e.g., Child's Game in Phase I and Parent's Game in Phase II) that occurred at the beginning of session. In accordance with the IFIRS system, the scheme that was used in determining the appropriate code level for the Defiance scale was based on a 1 (not at all characteristic) to 9 (mainly characteristic) scale. Children were assigned scores at the end of each 5- to 10-minute skill practices.

Caregiver Warmth. Caregiver warmth was assessed by the Warmth Scale from the Iowa Family Interaction Rating Scales, 5th edition, (IFIRS; Melby et al., 1998). The Warmth Scale measured the degree to which the focal (i.e., participating caregiver) expressed liking, appreciation, praise, care, concern, or support for the other person (i.e., participating child). This scale took into account three types of behavior: 1) nonverbal communication, such as affectionate touching, kissing, and loving smiles; 2) Supportiveness, such as showing concern for the other's welfare, offering encouragement, and praise; and 3) content, such as statements of affirmation, empathy, liking, appreciation, care, and concern. A caregiver who scored high on the Warmth Scale was generally positive and affirming and indicated a high level of support and/or understanding of the child's feelings and emotions. Consistent with Sadness and Defiance, the Warmth Scale was coded during session skill practices (e.g., Child's Game in Phase I and Parent's Game in Phase II) that occurred at the beginning of session. In accordance

with the IFIRS system, the scheme that was used in determining the appropriate code level for the Warmth scale was based on a 1 (not at all characteristic) to 9 (mainly characteristic) scale. Children were assigned scores at the end of each 5- to 10-minute skill practices.

Caregiver-Child Relationship Quality. Caregiver-child relationship quality was also assessed by the Relationship Quality Scale from the Iowa Family Interaction Rating Scales, 5th edition, (IFIRS; Melby et al., 1998). This scale assessed the quality of the caregiver-child relationship. A low score indicated an unhappy, emotionally unsatisfying, or brittle relationship. A high score indicated a warm, open, happy, and emotionally satisfying relationship. A score of 5 or a midpoint score indicated that there was no evidence concerning the quality of the relationship or the evidence was mixed. This scale also took into account Because this scale was used during Child's Game and Parent's Game, activity-based tasks with young children, coders also looked at the ease of interaction, camaraderie, and comfortableness between the child and caregiver.

The interactions were coded by trained observers. Coders included a doctoral level researcher, undergraduate students, and graduate students in the Clinical Psychology program at UNC-Chapel Hill. Each therapy session was coded by one coder, and for interrater reliability, 25% of sessions were coded by a second coder. For sessions that are double coded, there needed to be a minimum of 85% agreement for all codes. The interrater reliability for the present study was 92%. All nonmatching codes were resolved by discussion between coders, which, if not resolved, was coded by a third rater for resolution. For intra-rater reliability purposes, or the degree of agreement among repeated coded observations by a single rater, approximately 25% of session were randomly selected for recoding by the original coder.

Caregiver Use of HNC skills. The current study aimed to assess the extent to which

caregiver depressive symptoms were link to use of *HNC* skills both at baseline, as well as over the course of treatment. For measurement purposes, each of the *HNC* skills are operationalized here, then the criteria that were used to code Phase I skills and Phase II skills are described.

HNC is characterized by 5 skills throughout two Phases: Phase I (Attends, Rewards, Ignoring) and Phase II (Clear Instructions and Time out). Attends, the first skill taught in Phase I of *HNC*, are descriptive phrases that follow and refer to (1) the child's ongoing behavior ("You are stacking the blocks."), (2) objects directly related to the child's activity ("The car you are driving is moving fast."), and (3) his or her spatial position (e.g., "You're standing in the middle of the room"). Rewards, the second *HNC* skill, are praise or approval that refers to the child or the child's activity; Rewards include both specific (labeled --- "Great job of picking up your toys!") and nonspecific (unlabeled --- "Good job!") reference to "praiseworthy" behavior. Physical affection (e.g., hugs, high fives) is also counted as rewards. Ignoring, the third *HNC* skill and the final skill taught in Phase I (Differential Attention), refers to the removal of attention when the child begins to engage in disruptive behaviors (e.g., tantruming, yelling, whining, etc.). Once the child's engagement in a disruptive behavior ends, attention is restored using the skills of Attends and Rewards.

These skills were coded during Child's Game, which is a free-play situation in which the parent is instructed to engage in any activity that the child chooses and to allow the child to determine the nature and rules of the interaction. Child's Game occurred at the beginning of the session. During Child's Game, each instance in which a parent issues an Attend or Reward or engaged in one occurrence of Ignoring, 1 point was coded. Of note, one occurrence of Ignoring is demarcated by the onset of ignoring precipitated by the child's engagement in a disruptive behavior and the termination of ignoring following the child's disengagement in the disruptive

behavior. Points from Child's Game were totaled and divided by time (i.e., minutes spent in Child's Game) to obtain a Phase I skills score, also referred to *relationship enhancing skills*, for the session.

Once caregivers met mastery criteria for Phase I, they progressed to Phase II skills. The first Phase II skill, Clear Instructions, is a command to which a motoric response is appropriate and feasible. For a command to be considered a clear instruction, the caregiver must issue an instruction in which they 1) have the child's attention, 2) are specific in what they tell the child to do, 3) give one command at a time and do not issue another command before the child has had the opportunity to comply to the first command, and 4) allow the child 5 seconds to comply before proceeding to consequences for noncompliance. Time out is an action on the part of the parent that removes the child from positive reinforcement. The parent issues a verbal statement to the child ("Since you didn't hand me the block, you have to go to Time out") 5 to 10 seconds after stating the clear instruction and leads the child to a chair in the corner within 5 seconds following child noncompliance. Time out is the last skills taught in Phase II and the caregiver's involvement in treatment ends once the Phase II skills are mastered.

The goal of Phase II skills, the combination of Clear Instructions and Time out, is increasing child compliance. Accordingly, the child compliance mastery criteria were used as a proxy for the mechanism through which *HNC* is expected to lead to change to caregiver depressive symptoms in Phase II. Child compliance was measured using a ratio of child compliance to the number of clear instructions issued. For example, if a child complied 15 times during an instance in which 20 total clear instructions were issued, the Child Compliance for this child would be 75 meaning that the child complied 75% of the time. Of note, when a parent issues an unclear instruction and the child does not comply, this is not captured in the child

compliance ratio. The rationale being that it is unfair to punish a child in the instance of noncompliance if the child did not understand the instruction. Although predicating compliance on the issuance of a clear instruction is not in of itself problematic, balancing scientific rigor and clinical application can lead to rigidity that does not always lend itself to clinical judgement. For example, if a parent issues what is considered a clear instruction (e.g., "pick up the toys), but issues a reward slightly too soon (e.g., states "great job picking up the toys" while child reaches for toys rather than when child picks up toy) the instructions is then considered unclear. If the child then does not comply, this instance of noncompliance is not calculated in the child compliance ratio. As noted earlier, coding for child compliance and child defiance, together, may provide a more clinically accurate representation of child compliance, which is why the author of this study coded for both constructs in Phase II.

Child Compliance was coded during Parent's Game. In Parent's Game, the parent was instructed to engage the child in activities whose rules and nature were determined by the parent. The Parent's Game is essentially an "instruction" situation where the parent is in charge. During Phase II, parents engage in Parent's Game at the beginning of each Phase II session. The Child Compliance ratio for each Parent's Game for each session was calculated to obtain one Child Compliance ratio for each Phase II session.

For the Aim 1 analyses examining the association between depressive symptoms and use of HNC skills at baseline, a total Attends, Rewards, Ignoring, Clear Instruction, and Time out total score were composited for each family's baseline observation of Child's Game and Parent's Game. The total scores for each skill will be a simple aggregation of 1 point for every instance of that specific skill. Of note, all baseline observations lasted 10 minutes so average for time was unnecessary.

Results

First, analyses corresponding to Aim 1 will be presented. Second, a case study of each of the thirteen participating caregivers will be provided, including demographics and a description of depressive symptoms. Specifically, both baseline and post assessment subjective measures of depressive symptoms will be included, as well as the trajectory of caregiver depressive symptoms (i.e., Sadness Scale) throughout the course of the intervention. Each case study will also include a description of the trajectory of relationship enhancing skills (i.e., Phase I skills) for Phase I, as well as how that trajectory coincided with the trajectory of caregiver sadness. For Phase II, each case study will describe the trajectory of child compliance and how that trajectory coincided with changes in caregiver sadness during the same interval. Lastly, each case study will present the trajectories for child defiance, caregiver warmth, and caregiver-child relationship quality. Each of those study variables will also be discussed in terms of their fluctuations relative to changes in caregiver sadness.

With regard to notation, when referencing increases or decreases in study variables (i.e., sadness, warmth, child defiance, caregiver-child relationship quality, relationship enhancing skills, child compliance) from session to session, information regarding the session number (i.e., session 1, session 2, etc.), coding score (i.e., 0-9 for all variables based on Iowa Family Coding System) or computational score (i.e., calculated score relationship enhancing skills and child compliance), Phase (i.e., Phase I or Phase II), and skill being taught for that corresponding session (i.e., Orientation session, Attends, Rewards, Ignoring, Clear Instructions, Time out, Post Assessment) will be provided in parentheticals. For example, if referencing to a score of 5 on the

sadness scale in session two, the following will be included in parentheticals (S2 = 5, Phase I-Attends). S2 refers to session 2. The number 5 refers to a score of 5. Phase I refers to the Phase in which the family was in at the time of session 2. Lastly, Attends refers to the skill the family was learning in session 2.

Following case study descriptions, general patterns of study variables that emerged from the data will be described. Of note, parsing out Phase I cumulative effects, although ideal, is not possible with the sample size of the present study; therefore, the patterns of findings will be cautiously described to inform hypotheses for future, more highly powered studies.

Bivariate associations for HNC Skills (Attends, Rewards, Ignoring, Clear Instructions and Time out) and caregiver depressive symptoms using subjective, caregiver-report (BDI-II) and objective, observational measures (Sadness Scale) at baseline were conducted. As shown in Table 1, caregiver depressive symptoms, regardless of type of measure, were not significantly associated with any of the HNC skills. Despite these nonsignificant correlations, the magnitude of these correlations suggested the presence of moderate associations between baseline measures of depressive symptoms and HNC skills, which likely would have been significant with a larger sample size. For example, at baseline: Attends (r = -.48, p = *ns*), Rewards (r = -.43, p = *ns*), and Clear Instructions (r = -.47, p = *ns*) had correlations of moderate magnitudes with scores on the BDII. Similarly, baseline scores for caregiver sadness were also not significantly correlated with HNC skills; yet the magnitude of these correlations were moderately large, suggesting that greater power likely would have yielded significant findings [Attends (r = -.39, p = *ns*), Rewards (r = -.03, p = *ns*), Ignoring (r = .38, p = *ns*), and Clear Instructions (r = -.49, p = *ns*).

Unlike the correlations discussed above, the associations between the HNC skills of

Ignoring (r = .09, p = *ns*) and Time out (no computation as there were zero Time outs for all baseline observations) and BDI-II scores had very small magnitude sizes.

Case Studies

Case 1

Case 1 was a 35-year-old Caucasian, married, female who was the biological mother of the participating child. This family was randomized to the TEHNC group. At baseline, the caregiver reported depressive symptoms in the minimal range (BDI-II = 2). At post assessment, caregiver-reported depressive symptoms remained stable and in the minimal range (BDI-II = 2). Her score on the Sadness Scale was a two at baseline, also indicative of "minimal characteristics" of depressive symptoms (see Figure 1). Throughout the course of treatment, the caregiver evidenced a 1-point increase on the Sadness Scale at session two (S2 = 3, Phase I-Attends) (see Figure 1). Starting at session three, the caregiver's sadness score declined (S3 = 1, Phase I-Rewards) and remained at 1 for the remainder of treatment (see Figure 1), reflecting relative stability in low levels of depressive symptoms and, in turn, seemingly little correlation with the progress of treatment.

Caregiver 1 required 4 sessions to complete Phase I and evidenced a steady increase in the rate of Relationship Enhancing Skills (S1 = 2.04, Phase I-Orientation; S2 = 7.23, Phase I-Attends; S4 = 11.33, Phase I-Ignoring), except for a minor decrease in rate in session three (S3 = 5.43, Phase I-Rewards). The increase of caregiver sadness observed at session two (S2 = 3, Phase I-Attends) did not reflect a decrease or low rate of relationship enhancing skills at session two (S2 = 7.23, Phase I-Attends) (see Figure 2).

Caregiver 1 transitioned to Phase II at session five. The compliance ratio was zero at session five [S5 = 0, Phase II-Clear Instructions (CI)], but increased to 100 at session 6 (S6 =

100, Phase II-Time out (TO)] and remained at 100 for the last two sessions [S7 = 100, Phase II-TO; SPA = 100, Phase II – Post Assessment (PA)). Sadness remained at a score of 1 throughout Phase II (see Figure 2).

Child defiance at baseline indicated behaviors "somewhat characteristic" of child defiance (S1 = 5, Phase I-Orientation). At sessions two (S2 = 1, Phase I-Attends), three (S3 = 1, Phase I-Rewards), and four (S4 = 1, Phase I-Ignoring), child defiance decreased to 1. An increase in caregiver sadness (S2 = 3, Phase I-Attends) did not correspond to an increase in child defiance (S2 = 1, Phase I-Attends). Child defiance decreased to 1 in sessions seven (S7 = 1, Phase II – TO) and at Post Assessment (SPA = 1, Phase II-PA), which mirrored low levels of caregiver sadness (S7 = 1, Phase II – TO; SPA = 1; Phase II – PA) (see Figure 1).

For warmth, Caregiver 1 yielded a score of 6 at baseline (S1 = 6, Phase I-Orientation), a score considered in between "somewhat characteristic" and "moderately characteristic" of warmth. Caregiver warmth fluctuated throughout the course of treatment (See Figure 1). With regard to sadness, an increase in caregiver sadness (S2 = 3, Phase I-Attends) corresponded to a decrease in caregiver warmth (S2 = 3, Phase I-Attends). By the last treatment session, caregiver warmth had increased (S7 = 9, Phase II-TO), indicating behavior "mainly characteristic" of warmth (see Figure 1).

Caregiver-child relationship quality in Case 1 at baseline was a 7, which described a "somewhat positive" relationship. This score increased to an 9 by the end of treatment (S7 = 9, Phase II - TO), indicating a positive relationship. Regarding sadness, an increase in sadness (S2 = 3, Phase I-Attends) corresponded with a decrease in caregiver-child relationship quality (S2 = 6, Phase I-Attends) (see Figure 1).

Overall, this caregiver evidenced low sadness throughout the course of treatment. A small

increase in sadness at session 2 did correspond to a slight reduction in warmth and caregiver-child relationship quality, but did not appear to correspond with child defiance. In addition, while caregiver warmth and caregiver-child relationship quality increased to high levels and child defiance decreased to a low range by the end of treatment, sadness remained low.

Case 2

Case 2 was a 34-year-old Caucasian, divorced, female who was the biological mother of the participating child. This family was randomized to the TEHNC group. At baseline, the mother reported depressive symptoms in the minimal range (BDI-II = 10); however, at post assessment the caregiver reported depressive symptoms in the mild range (BDI-II = 19). Her score on the Sadness Scale was a two at baseline (S1 = 2, Phase I-Orientation), also indicative of "minimally characteristic" of depressive symptoms. By session four, her sadness score began to increase (S4 = 3, Phase I-Attends) and peaked at session five (S5 = 4, Phase I-Rewards). This caregiver's sadness reduced to a score of 1 by session seven (S7 = 1, Phase I-Ignoring) and remained low until post assessment in which the caregiver had a score of 3 (SPA = 3, Phase II-PA) (See Figure 3).

Caregiver 2 required seven sessions to complete Phase I and evidenced a consistently low rate of Relationship Enhancing Skills (S1 = 0, Phase I-Orientation; S2 = 13, Phase I-Attends; S3 = 2.92, Phase I-Attends; S4 = 2.56; Phase I-Attends; S5= 1.34, Phase I-Rewards) with slight increases in level by sessions six (S6 = 3.71, Phase I-Rewards) and seven (S7 = 3.54, Phase I-Ignoring). The increase in sadness from sessions three to five (S3 = 2, Phase I-Attends; S4 = 3, Phase I-Attends; S5 = 4, Phase I-Rewards) mirrored low rates of relationship enhancing skills for the same corresponding sessions (S3 = 2.92, Phase I-Attends; S4 = 2.56, Phase I-Attends; S5 = 1.34, Phase I-Rewards). Decreases in caregiver sadness at sessions 6 (S6 = 3, Phase I-Rewards)

and 7 (S6 = 1, Phase I-Ignoring) coincided with slight increases in relationship enhancing skills for the same sessions (S6 = 3.71, Phase I-Rewards; S7 = 3.54, Phase I-Ignoring). The increase in caregiver sadness in the post assessment session (SPA = 3, Phase II-PA) also coincided with a very low rate of relationship enhancing skills (SPA = 0.5, Phase II-PA) (See Figure 4).

Caregiver 2 transitioned to Phase II at session eight. The compliance ratio was 87 at session eight (S8 = 87, Phase II-CI), decreased at session nine to 66 (S9 = 66, Phase II-CI), increased to 100 at session ten (S10= 100, Phase II-TO), and decreased to 75 at post assessment (SPA = 75, Phase II-PA). Sadness remained at 1 throughout Phase II (S8 = 1, Phase II- CI; S9 = 1, Phase II-CI; S10 = 1, Phase II-TO) but evidenced an increase at the post assessment (SPA = 3), which mirrored a decrease in child compliance (SPA = 75, Phase II-PA) (See Figure 4).

At baseline, behaviors coded for child defiance were considered "moderately characteristic" (S1 =7, Phase I-Orientation). Child defiance decreased at session 2 and remained "minimally characteristic" (S2 =3, Phase I-Attends) or "not at all characteristic" (S2 = 1, Phase I-Attends) until session 5 when child defiance increased to 7 (S7 = 5, Phase I-Ignoring) ("moderately characteristic"). Child defiance decreased again at session 6 (S6 = 1, Phase I-Rewards) and remained "minimally characteristic" or "not at all characteristic" until post assessment when child defiance increased to a score of 6 (SPA = 6, Phase I-Rewards). As child defiance peaked at session 5 (S5 = 7, Phase I-Rewards) and post assessment (SPA = 6, Phase II-PA) so did caregiver sadness (S5 = 4, Phase I-Rewards; SPA = 3, Phase II-PA). As child defiance scores indicated "minimally characteristic" (score = 3) or "not at all characteristic" (score = 1) defiant behavior, caregiver sadness also remained in the same range (See Figure 3).

Caregiver 2 warmth was "minimally characteristic" (S1 = 3; Phase I-Orientation) at baseline. Caregiver warmth fluctuated throughout the course of treatment between a score of 1,

indicative of "not at all characteristic" of warmth (S4 =1, Phase I-Attends), and 3, indicative of "minimally characteristic" of warmth, (S1 = 3, Phase I-Attends; S2 =3, Phase I-Attends; S6 = 3, Phase I-Rewards; S7= 3, Phase I-Ignoring; S8 =3, Phase II-CI) with few exceptions. For example, at sessions 5, 10, and post assessment, caregiver warmth reached scores indicative of interactions "somewhat characteristic" of warmth (S3 = 4, Phase I-Attends; S5 = 5, Phase I-Rewards; S10 = 5, Phase II-TO; SPA = 5, Phase II-PA). With regard to depressive symptoms, a slight increase in caregiver sadness (S4 =3, Phase I-Attends) corresponded to a decrease in caregiver warmth in session 4 (S4 = 1, Phase I-Attends). When caregiver's behavior was "not at all characteristic" of sadness (S7 = 1, Phase I-Ignoring; S8 = 1, Phase II-CI; S10 = 1, Phase II-TO), caregiver child interactions were minimally to "somewhat characteristic" of warmth (S7 = 3, Phase I-Ignoring; S8 = 3, Phase II-CI; S10 = 5, Phase II-TO) (See Figure 3).

Caregiver-child relationship quality at baseline was a 5 (S1 = 5, Phase I-Rewards) indicating a relationship that is not excessively negative or excessively positive. Regarding sadness, an increase in sadness (S5 = 4, Phase I-Rewards; SPA = 3, Phase II-PA) corresponded with a decrease in caregiver-child relationship quality (S5 = 3, Phase I-Rewards, SPA = 5, Phase II-PA) at session 5 and at post assessment (See Figure 3).

Overall, this caregiver evidenced low sadness throughout the entire course of treatment; however, there was notable fluctuation in sadness. Specifically, when sadness increased in sessions 4 and 5, caregiver warmth and caregiver-child relationship quality decreased while child defiance showed increases. This similar pattern was observed at post assessment.

Case 3

Case 3 was a 29-year-old biracial, single, female who was the biological mother of the participating child. This family was randomized to the TEHNC group. At baseline, the mother

reported depressive symptoms in the minimal depression range on the BDI-II (BDI-II = 1) and remained in the minimal range (BDI-II = 1) by post assessment. Her score on the Sadness Scale was a three at baseline (S1 = 3, Phase I-Orientation), also indicative of "minimal characteristic" of sadness (see Figure 5). This score increased at session 2 (S2 =5, Phase I-Attends), began decreasing at session 3 (S3 = 2, Phase I-Attends), and remained low through session 6 (S 4 = 1, Phase I-Rewards; S5 = 1, Phase I-Ignoring; S6 = 1, Phase II-CI). At session 7, the caregiver evidenced a small increase in sadness (S7 = 3, Phase II-TO), but her sadness decreased in the last treatment session (S8 =2, Phase II-TO) and remained at 2 by post assessment (SPA=2, Phase II-PA) (see Figure 5). Overall, despite some fluctuations in sadness throughout the course of treatment, this caregiver showed a 1-point decrease in sadness from baseline (S1 = 3, Phase I-Orientation) to post assessment (SPA = 2, Phase II-PA).

Caregiver completed 6 sessions in Phase I and evidenced a steady increase in the rate of Relationship Enhancing Skills from sessions 1 through 3 (S1 = 3.33, Phase I-Orientation; S2 = 5.24, Phase II-Attends; S3 = 6.77-Phase I-Attends). There was a slight decrease in rate of use of Relationship Enhancing Skills in session 5 (S5 = 5.25, Phase I-Ignoring) and a considerable decrease in session 6 (S6 = 0.83; Phase II-CI). These reductions in the rate of use of Relationship Enhancing Skills did not coincide with an increase in sadness (S5 = 1, Phase I-Ignoring; S6 = 1, Phase II-CI).

Caregiver transitioned to Phase II at session 7. The compliance ratio was 85.7 at session 7 (S7 = 85.7, Phase II-TO), decreased to 75 at session 8 (S8 = 75, Phase II-TO) and increased again at post assessment (SPA = 87.5, Phase II-PA). Changes in compliance did not correspond to changes in caregiver sadness as expected. For example, when child compliance decreased from session seven (S7 = 85.71, Phase II-TO) to session eight (S8 = 75, Phase II-TO), so did

caregiver sadness (S7 = 3, Phase II-TO; S8 = 2, Phase II-TO).

Child Defiance at baseline was a 3 indicating “minimally characteristic” child defiant behavior. Child defiance gradually decreased and remained low (S2 = 2, Phase I-Attends; S3 = 1, Phase I-Attends; S4 = 1, Phase I-Rewards) until session 5 (S5 = 3, Phase I-Ignoring) where an increase was overserved. Another increase in child defiance was again observed in session seven (S7 = 5, Phase II-TO). Although a small reduction in child defiance was overserved in the last treatment session (S8=4, Phase II-TO), child defiance increased at post assessment (SPA=5, Phase II-PA), indicating behavior that was “moderately characteristic” of child defiance. The increase child defiance observed in Phase II (S7 = 5, Phase II-TO) corresponded to an increase in caregiver sadness (S7 = 3, Phase II-TO).

Caregiver warmth at baseline yielded a score of 5, indicative of behaviors “moderately characteristic” of warmth. There were several drastic increases and decreases in caregiver warmth throughout the course of treatment. For example, caregiver warmth plummeted from session one (S1 = 5, Phase I-Orientation) to session two (S2 = 1, Phase I-Attends). This reduction also corresponded to an increase in caregiver sadness from session one (S1 = 3, Phase I-Orientation) to session two (S2 = 5, Phase I-Attends). From sessions two to four, warmth gradually increased (S2 = 1, Phase I-Attends; S3 = 3, Phase I-Attends; S4 = 7, Phase I-Rewards). This increase also mirrored a decrease in caregiver sadness (S2 = 5, Phase I-Attends; S3 = 2, Phase I-Attends; S4 = 1, Phase I-Rewards). A slight decrease in caregiver warmth from sessions five through seven (S5 = 6, Phase I-Ignoring; S6 = 3, Phase II-CI; S7 = 3, Phase II-TO) also corresponded to a slight increase in caregiver sadness from session five through 7 (S5 = 1, Phase I-Ignoring; S6 = 1, Phase II-CI; S7 = 3, Phase II-TO). By the last treatment session, caregiver warmth had increased (S8 = 5, Phase II-TO) and remained unchanged at post assessment (SPA =

5, Phase II-PA). This coincided with a decrease in caregiver sadness (S8 = 2, Phase II-TO) that also remained unchanged at post assessment (SPA = 2, Phase II-PA).

Caregiver-child relationship quality at baseline was a 6 indicative of a relationship that was slightly more positive than negative. Consistent with caregiver warmth, there were several drastic increases and decreases in caregiver-child relationship quality throughout the course of treatment. For example, caregiver-child relationship quality decreased substantially from session one (S1 = 6, Phase I-Orientation) to session two (S2 = 2, Phase I-Attends). This reduction also corresponded to an increase in caregiver sadness from session one (S1 = 3, Phase I-Orientation) to session two (S2 = 5, Phase I-Attends). From sessions two to four, caregiver-child relationship quality gradually increased (S2 = 2, Phase I-Attends; S3 = 5, Phase I-Attends; S4 = 7, Phase I-Rewards). This increase also mirrored a decrease in caregiver sadness (S2 = 5, Phase I-Attends; S3 = 2, Phase I-Attends; S4 = 1, Phase I-Rewards). By the last treatment session, caregiver-child relationship quality had increased (S8 = 7, Phase II-TO) following fluctuations between sessions five through 7. This remained unchanged at post assessment (SPA = 7, Phase II-PA). This coincided with a decrease in caregiver sadness (S8 = 2, Phase II-TO) that also remained unchanged at post assessment (SPA = 2, Phase II-PA).

Overall, this caregiver evidenced behaviors that ranged from “not at all characteristic” of sadness to “somewhat characteristic” of sadness throughout the entire course of treatment. By post assessment, this caregiver had experienced a 1-point reduction in sadness relative to baseline. Although fluctuations in Relationship enhancing skills and child compliance did not appear to coincide with changes in sadness as predicted, major increases and decreases in caregiver warmth, caregiver-child relationship quality, and to some extent child defiance coincided with decreases and increases in caregiver sadness as hypothesized.

Case 4

Case 4 was a 57-year-old African American, single, female whose was the maternal grandmother of the participating child. This family was randomized to the HNC group. At baseline, this caregiver reported depressive symptoms in the mild depression range on the BDI-II (BDI-II = 14). At post assessment, this caregiver reported a reduction in depression symptoms that placed her in the minimal depression range (BDI-II = 9). Her score on the Sadness Scale was a 1 at baseline (S1 = 1, Phase I-Orientation), indicative of behaviors "not at all characteristic" of sadness (see Figure 7). This score increased at session 3 (S3 =3, Phase I-Attends) but quickly decreased at session 4 (S4 = 1, Phase I-Attends). This caregiver's sadness scores remained at 1 from session 4 to the post assessment.

Caregiver completed 7 sessions in Phase I and evidenced a steady increase in the rate of Relationship Enhancing Skills from session three through session seven (S3 = 0.32, Phase I-Attends; S4 = 4.95, Phase I-Attends; S5 = 6.88, Phase I-Attends; S6 = 7.07, Phase I-Rewards; S7 = 8.25, Phase I-Ignoring). This steady increase in Relationship Enhancing Skills use corresponded with low, stable scores of sadness (S4 = 1, Phase I-Attends; S5 = 1, Phase I-Attends; S6 = 1, Phase I-Rewards; S7 = 1, Phase I-Ignoring). Lastly, when sadness was at its highest score (S2=3, Phase I-Attends), the rate of use for Relationship Enhancing skills was at its second lowest score (S2 = .32, Phase I-Attends).

Caregiver transitioned to Phase II at session eight. The compliance ratio was 100 and remained at 100 at session nine (S9 = 100, Phase II-TO) and at post assessment (SPA = 100, Phase II-PA). When child compliance was at 100, caregiver sadness remained at its lowest possible score (S8 =1, Phase II- CI; S9 =1, Phase II-TO; SPA = 1, Phase II-PA).

Child defiance at baseline was a 1 indicating that child behaviors were "not at all

characteristic" of defiance. Child defiance dramatically increased at session three (S3 = 7, Phase I-Attends), which corresponded to an increase in caregiver sadness (S3 = 3, Phase I-Attends). Following session three, child defiance slightly reduced in session 4 (S4 = 5, Phase I-Attends) and continued to decrease in the following sessions (S5 = 2, Phase I-Attends; S6 = 2, Phase I-Rewards; S7 = 1, Phase I-Ignoring; S8 = 1, Phase II-CI; S9 = 1, Phase II-TO; SPA = 1, Phase II-PA). This reduction also mirrored the reduction in caregiver sadness from session three (S3 = 3, Phase I-Attends) to post assessment (SPA = 1, Phase II-PA).

Caregiver warmth at baseline yielded a score of 7, indicative of behaviors "moderately characteristic" of warmth. Consistent with child defiance, caregiver warmth dramatically decreased at session three (S3 = 2, Phase I-Attends) which mirrored an increase in caregiver sadness (S3 = 3, Phase I-Attends). As warmth generally increased between session three (S3 =2, Phase I-Attends) and the post assessment (SPA = 8, Phase II-PA), caregiver sadness decreased from session three (S3 = 3, Phase I-Attends) to the post assessment (SPA = 1, Phase II-PA) as well.

Caregiver-child relationship quality at baseline was a 9 indicative of a very positive relationship. This score, however, decreased in session 3 (S3 = 4, Phase I-Attends), which corresponded to an increase in caregiver sadness (S3 = 3, Phase I-Attends). As caregiver-child relationship quality improved (S4 = 4, Phase I-Attends; S5 = 7, Phase I-Attends; S6 = 7, Phase I-Rewards; S7 = 7, Phase I-Ignoring; S8 = 7, Phase II-CI; S9 = 9, Phase II-TO; SPA = 8, Phase II-PA), caregiver sadness decreased and remained low (S4 = 1, Phase I-Attends; S5 = 1, Phase I-Attends; S6 = 1, Phase I-Rewards; S7 = 1, Phase I-Ignoring; S8 = 1, Phase II-CI; S9 = 1, Phase II-TO; SPA = 1, Phase II-PA).

Overall, this caregiver evidenced behaviors "minimally characteristic" of sadness in 1

session (S3=1, Phase I-Attends), while not evidencing any characteristics of sadness in all other sessions. This increase of sadness in session three also coincided with decreases in caregiver warmth, caregiver-child relationship quality, and rate of Relationship Enhancing skills while also coinciding with increases in child defiance. When this family reached Phase II, compliance remained at 100 percent while sadness remained at a score of 1, indicating caregiver behaviors "not at all characteristic" of sadness.

Case 5

Case 5 was a 31-year-old Caucasian, male, whose was the biological father of the participating child. This family was randomized to the TEHNC group. At baseline, this caregiver reported depressive symptoms in the minimal depression range on the BDI-II (BDI-II = 7). At post assessment, this caregiver reported a 1-point increase in depressive symptoms but remained in the minimal depression range (BDI-II = 8). His score on the Sadness Scale was a 1 at baseline (S1 = 1, Phase I-Orientation), indicative of "minimal characteristics" of sadness (see Figure 7). Caregiver sadness proceeded to vacillate between 1 and 2 for the remainder of treatment (S1 =1, Phase I-Orientation; S2 = 2, Phase I-Attends; S3 = 1, Phase I-Rewards; S4 = 2, Phase I-Ignoring; S5 = 1, Phase I-Ignoring; S6 = 1, Phase II-CI; S7 =2, Phase II-TO; S8 =1, Phase II-TO; SPA =1, Phase II-PA) and concluded the program with a sadness score of 1 (SPA =1, Phase II-PA).

Caregiver completed 5 sessions in Phase I and evidenced a steady increase in the rate of Relationship Enhancing Skills from session one through session four (S1 = 0.55, Phase I-Orientation; S2= 4.5, Phase I-Attends; S3 = 7.4, Phase I-Rewards; S4 = 7.27, Phase I-Ignoring). This steady increase in Relationship Enhancing Skills use corresponded with low scores of sadness (S1 =1, Phase I-Orientation; S2 = 2, Phase I-Attends; S3 = 1, Phase I-Rewards; S4 = 2, Phase I-Ignoring), although these scores did alternate between scores of 1 and 2, which were still

below the threshold of behaviors “minimally characteristic” of sadness.

Caregiver transitioned to Phase II at session six. The compliance ratio at session six was 47.06, 66.67 at session seven, 100 at session eight, and 92.31 at post assessment. Fluctuations in child compliance did not appear to correspond with sadness scores, remaining relative low (S6 = 1, Phase II-CI; S7 = 2, Phase II-TO; S8 = 1, Phase II-TO; SPA = 1, Phase II-PA).

Child defiance at baseline was a 1 indicating that child behaviors were “not at all characteristic” of defiance. Child defiance remained at a score 1 throughout phase I. At session 6, child defiance dramatically increased (S6 = 7, Phase II-CI), which did not correspond to an increase in caregiver sadness (S6 = 1, Phase II-CI). When child behavior was observed to be “somewhat characteristic” of defiance in session seven (S7 = 5, Phase II-TO), there was a very slight increase in sadness (S7 = 2, Phase II-TO). Child defiance continued to decrease as did sadness until both were given a score of 1 at post assessment (SPA = 1, Phase II-PA).

Caregiver warmth at baseline yielded a score of 4, indicative of behaviors “minimally characteristic” of warmth. A slight reduction in warmth (S2 = 2, Phase I-Attends) coincided with a very slight increase in caregiver sadness (S2 = 2, Phase I-Attends) in session 2 of treatment. No other fluctuations in caregiver warmth coincided with increases or decreases in caregiver sadness in expected directions.

Caregiver-child relationship quality at baseline was a 7 indicative of a somewhat positive relationship. This score slightly decreased in session 2 (S2 = 5, Phase I-Attends), which corresponded to slight increase in caregiver sadness (S2 = 2, Phase I-Attends). A moderate increase in caregiver-child relationship quality in session five (S5 = 8, Phase I-Ignoring) mirrored a slight decrease in caregiver sadness (S5 = 1, Phase I-Ignoring). No other fluctuations in caregiver-child relationship quality coincided with increases or decreases in caregiver sadness

in expected directions.

Overall, this caregiver never evidenced behaviors that reached the threshold that could be considered “minimally characteristic” of sadness (scores between equal to or greater to 3). There were limited instances in which a decrease or lower score in caregiver warmth or caregiver-child relationship quality mirror an increase in caregiver sadness. There did not appear to be any detectable relationship or pattern between caregiver sadness and child defiance, relationship enhancing skills, or child compliance for this family.

Case 6

Case 6 was a 28-year-old African American, divorced, female whose was the biological mother of the participating child. This family was randomized to the HNC group. At baseline, this caregiver reported depressive symptoms in the mild depression range on the BDI-II (BDI-II = 18). At post assessment, this caregiver reported a 16-point reduction in depression symptoms that placed her in the minimal depression range (BDI-II = 2). Her score on the Sadness Scale was a 2 at baseline (S1 = 2, Phase I-Orientation), indicative of behaviors in between “not at all characteristic” and “minimally characteristic” of sadness (see Figure 11). This score increased at session four (S4 = 3, Phase I-Rewards) and session six (S6 =4, Phase II-CI) and decreased at session seven (S7 = 3, Phase II-CI) and session eight (S8 = 1, Phase II-TO). This caregiver’s sadness scores remained at 1 at the post assessment (SPA = 1, Phase II-PA).

Caregiver completed 5 sessions in Phase I, and her progress in the rate of Relationship Enhancing Skills varied from session to session (S1 = 0.16, Phase I-Orientation; S2 = 4, Phase I-Attends; S3 = 3.56, Phase I-Attends; S4 = 1.40, Phase I-Rewards; S5 = 4.67, Phase I-Ignoring). The lowest rates of relationship enhancing skills corresponded with the highest scores in caregiver sadness in Phase I sessions (S1 = 2, Phase I-Orientation; S4 = 3, Phase I-Rewards).

Caregiver transitioned to Phase II at session six. The compliance ratio was 90.91 at session six, 84.62 at session seven, 100 at session eight, and 100 at post assessment. When child compliance was at 100% in session eight and at post assessment, caregiver sadness was observed at the lowest score possible (S8 =1, Phase II-TO; SPA = 1, Phase II-PA).

Child defiance at baseline was a 2 indicating that child behaviors were in between "not at all characteristic" and "minimally characteristic" of defiance. Child defiance increased at session two (S2 = 3, Phase I-Attends), session six (S6 = 3, Phase II-CI), and at post assessment (SPA = 3, Phase II-PA). Caregiver sadness, however, only corresponded to an increase in session six (S6 = 4, Phase II-CI) relative to child defiance.

Caregiver warmth at baseline yielded a score of 4, indicative of behaviors in between "minimally" and "somewhat characteristic" of warmth. Caregiver warmth frequently fluctuated throughout treatment (See Figure 11). Notable scores include a relatively high score of caregiver warmth at session three (S3 = 7, Phase I-Attends) and post assessment session (SPA = 7, Phase II-PA) corresponding to a low score of caregiver sadness at session three (S3 = 1, Phase I-Attends) and post assessment (SPA =1, Phase II-PA).

Caregiver-child relationship quality at baseline was a 7 indicative of a somewhat positive relationship. As with caregiver warmth, caregiver-child relationship quality fluctuated greatly throughout the course of treatment. At times decreases in caregiver- child relationship quality (S2 = 3, Phase I-Attends; S7 = 5, Phase II-CI) corresponded with decreases in caregiver sadness (S2 = 3, Phase I-Attends; S7 = 4, Phase II-CI), which was in support of study hypotheses

Overall, this caregiver evidenced sadness scores between 1 ("not at all characteristic" of sadness) and 4 (in between "minimally characteristic" and "somewhat characteristic" of sadness) throughout session. At times the changes in caregiver sadness corresponded with changes in

relationship enhancing skills, child compliance, child defiance, caregiver warmth, and caregiver-child relationship quality in the expected direction. At other times, changes in relationship enhancing skills, child compliance, child defiance, caregiver warmth, and caregiver-child relationship quality did not correspond to changes in caregiver sadness in the hypothesized directions.

Case 7

Case 7 was a 47-year-old Caucasian, divorced, female whose was the biological mother of the participating child. This family was randomized to the TEHNC group. At baseline, this caregiver reported depressive symptoms in the minimal depression range on the BDI-II (BDI-II = 10). At post assessment, this caregiver reported a 6-point reduction in depression symptoms and remained in the minimal depression range (BDI-II = 4). Her score on the Sadness Scale was a 1 at baseline (S1 = 1, Phase I-Orientation), indicative of behaviors "not at all characteristic" of sadness (see Figure 7). This score never increased and remained at 1 for the duration of treatment and at the post assessment.

Caregiver completed 4 sessions in Phase I and evidenced a steady increase in the rate of Relationship Enhancing Skills from session one through session four (S1 = 0.29, Phase I-Orientation; S2 = 2.22, Phase I-Attends; S3 = 6.12, Phase I-Rewards; S4 = 7.06, Phase I-Ignoring). While Relationship Enhancing Skills increased, caregiver sadness remained low and stable (S1 = 1, Phase I-Orientation; S2 = 1, Phase I-Attends; S3 = 1, Phase I-Rewards; S4 = 1, Phase I-Ignoring).

Caregiver transitioned to Phase II at session five. The compliance ratio remained high through Phase II (S5 = 100, Phase II-CI; S7 = 100, Phase II- CI; SPA = 93.33, Phase II-PA) with a moderate decrease in session six (S6 = 75, Phase II-CI). Despite a moderate decrease in

compliance, caregiver sadness score remained at 1 for all Phase II sessions and post assessment session.

Child defiance at baseline was a 3 indicating that child behaviors were "minimally characteristic" of defiance. Child defiance decreased at session two (S2=1, Phase I-Attends), increased slightly at session four (S4 = 3, Phase I-Ignoring), decreased again at session six (S6 = 1, Phase II-CI), and ultimately again in the post assessment (SPA = 4, Phase II-PA). Despite fluctuations in child defiance, caregiver sadness never exceeded a score of 1.

Caregiver warmth at baseline yielded a score of 4, indicative of behaviors in between "minimally" and "somewhat characteristic" of warmth. Caregiver warmth steadily increased from session one to session four (S1 = 4, Phase I-Orientation; S2 = 5, Phase I-Attends; S3 = 6, Phase I-Rewards; S4=7, Phase I-Ignoring) and plateaued until session seven where there was a moderate decrease (S7 = 4, Phase II-CI). Although caregiver warmth increased in the last treatment session (S8= 6, Phase II-TO), it slightly decreased in the post assessment session (SPA = 5, Phase II-PA). Regardless of these fluctuations, caregiver depressive symptoms never exceeded a score of 1.

Caregiver-child relationship quality at baseline was a 6, which was 1 point below the somewhat positive relationship threshold. Caregiver-child relationship quality was equal to or greater than a score of 6 for the remainder of treatment with one exception. In session 4, relationship quality moderately decreased (S3=3, Phase I-Rewards). This reduction, however, did not correspond with any increase in caregiver sadness, which remained at a score of 1 for the entire course of treatment.

Overall, this caregiver 7 did not evidence any behaviors characteristic of sadness throughout the entire intervention. Relationship enhancing skills, child compliance, caregiver

warmth, and caregiver-child relationship quality generally increased with minor exceptions. Child defiance fluctuated as well but did not appear to affect or influence caregiver sadness.

Case 8

Case 8 was 32-year-old Caucasian, divorced, female whose was the biological mother of the participating child. This family was randomized to the HNC group. At baseline, this caregiver reported depressive symptoms in the mild range on the BDI-II (BDI-II = 15). At post assessment, this caregiver reported a 2-point reduction in depression symptoms placing her in the minimal range (BDI-II = 13). Her score on the Sadness Scale was a 2 at baseline (S1 = 2, Phase I-Orientation), indicative of behaviors in between "not at all characteristic" and "minimally characteristic" of sadness (see Figure 15). This score slightly increased at session two (S2 = 4, Phase I-Attends) and decreased at session three (S3 = 1, Phase I-Rewards) and proceeded to remain at a score of 1 through session four (S4 = 1, Phase I-Rewards) and session five (S5 = 1, Phase I-Rewards). Similarly, caregiver sadness increased at session six (S6 = 2, Phase I-Rewards) and promptly decreased at session eight (S8 = 1, Phase I-Rewards) and remained at a score of 1 for session nine (S9 = 1, Phase I-Ignoring). Caregiver sadness increased again at session eleven (S11 = 2, Phase II-CI) and session twelve (S12 = 4, Phase II-Timeout). By post assessment, however, sadness had decreased (SPA = 1, Phase II-PA).

Caregiver 8 completed 9 sessions in Phase I. Of note, caregiver did not engage in child's game in sessions seven. Therefore, there was no coding data for that session. Caregiver evidenced a steady increase in the rate of Relationship Enhancing Skills use with moderate reductions in rate of use in sessions four (S4 = 2.4, Phase I-Rewards), six (S6 = 2.9, Phase I-Rewards), and eight (S8 = 2, Phase I-Rewards). Of those three decreases in the rate of use of relationship enhancing skills, caregiver sadness coincided with a slight increase in session six

(S6 = 2, Phase I-Rewards).

Caregiver 8 transitioned to Phase II at session ten; however, as with Phase I, coding data was missing for session ten, in which caregiver did not engage in parent's game. The child compliance ratio for session eleven was 50% (S11 = 50, Phase II-CI) followed by an increase to 88.9% at session twelve (S12 = 88.9, Phase II-TO). By post assessment, compliance decreased to 66.7% (SPA = 66.7, Phase II-PA). Caregiver sadness did not coincide with compliance in the expected directions; rather, sadness had scores of 1 (S11 = 1, Phase II-CI; SPA = 1, Phase II-PA) when child compliance was relatively low (S11 = 50%, Phase II-CI; SPA = 66.7 %, Phase II-PA). Meanwhile, an increase in child compliance (S12 = 88.9%) corresponded with a moderate increase in caregiver sadness (S12 = 4, Phase II-TO).

Child defiance at baseline was a 3 indicating that child behaviors were minimally characteristic of defiance. Child defiance increased at session two (S2=5, Phase I-Rewards), which mirrored an increase in caregiver sadness (S2 = 2, Phase I-Rewards). In session three, child defiance decreased by 4 points (S2 = 1, Phase I-Rewards) and remained at a score of 1 ("not at all characteristic") at sessions four (S4 = 1, Phase I-Rewards) and five (S5 = 1, Phase I-Rewards). Similar to child defiance, sadness also decreased moderately at Session three (S3 = 1, Phase I-Rewards) and remained at a score of 1 for the proceeding two session (S4 = 1, Phase I-Rewards; S5 = 1, Phase I-Rewards). At session 6, child defiance increased (S6 = 3, Phase I-Rewards), which also corresponded to an increase in caregiver sadness (S6 = 2, Phase I-Rewards). For sessions eight and nine, both child defiance and caregiver sadness remained at the lowest score possible (S8 = 1, Phase I-Rewards; S9 = 1, Phase I-Ignoring). Although child defiance increased again in session seven, (S11 = 3, Phase II-CI), caregiver sadness did not increase (S11 = 1, Phase II-CI). Child Defiance peaked at session twelve (S12 = 7, Phase II-TO)

which coincided with a moderate increase in caregiver sadness (S12 = 4, Phase II-TO). Lastly, as child defiance dramatically decreased at the post assessment (SPA = 1, Phase II-PA), caregiver sadness also evidenced a decrease (SPA = 1, Phase II-PA).

Caregiver warmth at baseline yielded a score of 2 (S1 = 2, Phase I-Orientation), indicative of behaviors in between "not at all characteristic" and "minimally characteristic" of warmth. Caregiver warmth increased at sessions two (S2 = 3, Phase I-rewards), three (S3 = 5, Phase I-Rewards), and four (S4 = 7, Phase I-Rewards) before evidencing a 5-point reduction at session five (S5 = 2, Phase I-Rewards). Caregiver warmth demonstrated increases again at sessions eight (S8 = 7, Phase I-Rewards), eleven (S11 = 5, Phase II-CI), and post assessment (SPA = 7, Phase II-PA) with minor decreases at sessions nine (S9 = 4, Phase I-Ignoring) and twelve (S12 = 4, Phase II-TO). Consistent with study hypotheses, caregiver sadness remained low (S3 = 1, Phase I-Rewards; S4 = 1, Phase I-Rewards; S8 = 1, Phase I-Rewards; S11= 1, Phase II-CI; SPA= 1, Phase II-PA) when warmth was moderate to high (S3 = 5, Phase I-Rewards; S4 = 7, Phase I-Rewards; S8 = 7, Phase I-Rewards; S11= 5, Phase II-CI; SPA= 7, Phase II-PA). Additionally, low levels of warmth (S2 = 3, Phase I-Attends; S6 = 3, Phase I-Rewards) coincided with a moderate increase in caregiver sadness in session 2 (S2 = 4, Phase I-Attends).

Caregiver-child relationship quality at baseline was a 5, indicative of a relationship that is neither excessively positive or negative. This score decreased in session 2 (S2 = 3; Phase I-Attends). Caregiver- child relationship increased at session three (S3 = 7, Phase I-Rewards) and remained at a score of 5 or above with an exception at session twelve (S12 = 4, Phase II-TO). The lower scores on caregiver-child relationship quality (S2 = 3, Phase I-Attends; S12 = 4, Phase II-TO) corresponded with moderate scores of caregiver sadness (S2 = 4, Phase I-Attends; S12 = 4, Phase II-TO), while moderate to high scores on caregiver warmth (S1 = 5, Phase I-

Orientation; S3 = 7, Phase I-Rewards; S4 = 8, Phase I-Rewards; S5 = 5, Phase I-Rewards; S6 = 5, Phase I-Rewards; S8 = 8, Phase I-Rewards; S9 = 7; Phase II-Ignoring; S11 = 6, Phase II-CI; SPA = 8; Phase II-PA) coincided with low caregiver sadness scores (S1 = 2, Phase I-Orientation; S3 = 1, Phase I-Rewards; S4 = 1, Phase I-Rewards; S5 = 2, Phase I-Rewards; S6 = 1, Phase I-Rewards; S8 = 1, Phase I-Rewards; S9 = 1; Phase II-Ignoring; S11 = 1, Phase II-CI; SPA = 1; Phase II-PA).

Overall, Caregiver 8 started treatment with a low sadness score, which decreased even further by the end of treatment. Although caregiver 8 did not generally exhibit high levels of depressive symptoms, caregiver sadness did peak twice during the intervention. These peaks were accompanied by increases in child defiance and decrease in caregiver warmth and caregiver-child relationship quality. Also noteworthy is the general pattern of low sadness scores coinciding with moderate to high levels of caregiver warmth and caregiver-child relationship quality and low child defiance.

Case 9

Case 9 was 51-year-old African American, separated, female whose was the biological mother of the participating child. This family was randomized to the HNC group. At baseline, Caregiver 9 reported depressive symptoms in the minimal range on the BDI-II (BDI-II = 5). At post assessment, this caregiver reported a 4-point reduction in depression symptoms remaining in the minimal range (BDI-II = 1). Her score on the Sadness Scale was a 3 at baseline (S1 = 3, Phase I-Orientation), indicative of behaviors “minimally characteristic” of sadness (see Figure 17). This score remained stable at sessions three (S3 = 3, Phase I-Rewards) and four (S4 = 3, Phase I-Ignoring) and slightly increased at session five (S5 = 4, Phase II-CI) before slightly decreasing at session six (S6 = 3, Phase II-TO) and at post assessment (SPA = 2, Phase II-PA).

Caregiver 9 completed four sessions in Phase I. Of note, caregiver did not engage in child's game in session two; therefore, coding data were not available for session two (Attends). Caregiver evidenced a steady increase in the rate of Relationship Enhancing Skills use with from session one to session three (S1 = 0, Phase I-Orientation; S3 = 4.76, Phase I-Rewards) with a very minor decrease in session four (S4 = 4.15, Phase I-Ignoring). The trajectory of relationship enhancing skills did not correspond with any fluctuations in caregiver sadness, which remained at a steady score for the corresponding Phase I sessions (S1 = 3, Phase I-Orientation; S3 = 3, Phase I-Rewards; S4 = 3 Phase I-Ignoring).

Caregiver 9 transitioned to Phase II at session five. The child compliance ratio for Phase II sessions were as follows: 88.3 (S5 = 88.3, Phase II-CI), 100 (S6 = 100, Phase II-TO), and 100 (SPA = 100, Phase II-PA). High ratios of child compliance corresponded with consistent decrease of caregiver sadness (S5 = 4, Phase II-CI; S6 = 3, Phase II-TO; SPA = 2, Phase II-PA).

Child defiance at baseline was a 1 indicating that child behaviors were "not at all characteristic" of defiant behavior. Child defiance remained low throughout the entire intervention with very few and minor increases (S1 = 1, Phase I-Orientation; S3 = 2, Phase II-Rewards; S3 = 1; Ignoring; S4 = 1, Phase II-CI; S5 = 1, Phase II-TO; SPA = 2, Phase II, PA). The trajectory of caregiver sadness did not correspond to fluctuations in child defiance.

Caregiver warmth at baseline yielded a score of 2 (S1 = 2, Phase I-Orientation), indicative of behaviors in between "not at all characteristic" and "minimally characteristic" of warmth. Caregiver warmth remained low (S4 = 3, Phase I-Ignoring; S5 = 3, Phase II-CI; S6 = 3, Phase II-CI) with slight increases in sessions two (S3 = 4, Phase I-Rewards) and post assessment (SPA = 4, Phase II-PA). In relation to sadness, as caregiver warmth approached moderate levels S3 = 4, Phase I-Rewards; SPA = 4, Phase II-PA, caregiver sadness remained low (S3 = 1, Phase

I-Rewards; SPA = 1, Phase II-PA).

Caregiver-child relationship quality at baseline was a 6, indicative of a relationship that is slightly positive. Caregiver-child relationship quality remained moderate to high for all sessions (S1 = 6, Phase I-Orientation; S3 = 5, Phase I-Rewards; S4 = 5, Phase I-Ignoring; S5 = 5, Phase II-CI; S6 = 7, Phase II-TO; SPA = 6; Phase II-PA), which corresponded to low sadness scores (S1 = 3, Phase I-Orientation; S3 = 3, Phase I-Rewards; S4 = 3, Phase I-Ignoring; S6 = 3, Phase II-TO; SPA = 2; Phase II-PA), with an exception for session five (S5 = 4, Phase II-CI).

Overall, Caregiver 9 generally exhibited low levels of sadness throughout treatment. This corresponded with moderate to levels of caregiver-child relationship quality and low levels of child defiance. Contrary to study hypotheses, caregiver warmth remained generally low despite low levels of caregiver sadness.

Case 10

Case 10 was 40-year-old Caucasian, married, female whose was the biological mother of the participating child. This family was randomized to the HNC group. At baseline, this caregiver reported depressive symptoms in the minimal range on the BDI-II (BDI-II = 11). At post assessment, this caregiver reported a 5-point increase in depression symptoms placing her in the mild range (BDI-II = 16). Contrariwise, her score on the Sadness Scale was a 1 at baseline (S1 = 1, Phase I-Orientation) and remained at a 1 for the remainder of treatment sessions (S1 = 1, Phase I-Orientation; S2 = 1, Phase I-Attends; S3 = 1, Phase I-Attends; S4 = 1, Phase I-Rewards; S5 = 1, Phase I-Ignoring; S6 = 1, Phase II-CI; S7 = 1, Phase II-TO) and post assessment (SPA = 1, Phase II-PA).

Caregiver 10 completed five sessions in Phase I. Caregiver used Relationship Enhancing Skills at moderate to high rates with slight fluctuations S1 = 0, Phase I-Orientation; S2 = 9,

Phase I-Attends; S3 = 5.3, Phase I-Attends; S4 = 5.1, Phase I-Rewards; S5 = 8, Phase I-Ignoring). As reported earlier, caregiver sadness remained at a score of 1 for all of Phase I sessions.

Caregiver 10 transitioned to Phase II at session six. The child compliance ratio for Phase II sessions were 94.7 (S6 = 94.7, Phase II-CI), 80 (S7 = 80, Phase II-TO), and 84.7 (SPA = 84.7, Phase II-PA). While child compliance fluctuated slightly between Phase II sessions, child compliance remained high nonetheless. Consistent with Phase I, caregiver sadness remained low for all Phase II sessions (S6 = 1, Phase II-CI; S7 = 1, Phase II-TO; SPA = 1, phase II-PA).

Child defiance at baseline was a 3 indicating that child behaviors were minimally characteristic of defiance. Child defiance decreased at session two (S2 = 1, Phase I-Attends) and remained at a score of 1 for the remainder of the intervention (S3 = 1, Phase I-Attends; S4 = 1, Phase I-Rewards; S5 = 1, Phase I-Ignoring; S6 = 1, Phase II-CI; S7 = 1, Phase II-TO; SPA = 1, Phase II-PA). These low scores also coincided with low sadness scores (S1 = 1, Phase I-Orientation; S2 = 1, Phase I-Attends; S3 = 1, Phase I-Attends; S4 = 1, Phase I-Rewards; S5 = 1, Phase I-Ignoring; S6 = 1, Phase II-CI; S7 = 1, Phase II-TO; SPA = 1, Phase II-PA).

Caregiver warmth at baseline yielded a score of 5 “somewhat characteristic” of warmth (S1 = 5, Phase I-Orientation). Caregiver warmth generally remained moderate to high (S3 = 7, Phase I-Attends; S5 = 7, Phase I-Ignoring; S6 = 7, Phase II-CI; S7 = 7, Phase II-TO; SPA = 7, Phase II-PA) with exceptions in sessions two (S2 = 3, Phase I-Attends) and four (S4 = 4, Phase I –Rewards). In relationship to caregiver sadness, sadness remained low (S1 = 1, Phase I-Orientation; S2 = 1, Phase I-Attends; S3 = 1, Phase I-Attends; S4 = 1, Phase I-Rewards; S5 = 1, Phase I-Ignoring; S6 = 1, Phase II-CI; S7 = 1, Phase II-TO; SPA = 1, Phase II-PA) when caregiver warmth evidenced moderate to high levels (S1 = 5, Phase I-Orientation; S3 = 7, Phase

I-Attends; S5 = 7, Phase I-Ignoring; S6 = 7, Phase II-CI; S7 = 7, Phase II-TO; SPA = 7, Phase II-PA and when caregiver warmth had slight decreases (S2 = 3, Phase I-Attends; S4 = 4, Phase I – Rewards).

Caregiver-child relationship quality at baseline was a 4, indicative of a relationship that was slightly negative. This score increased in session 2 (S2 = 6; Phase I-Attends) and remained at a score of 6 (S4 = 6, Phase I-Rewards) or higher (S3 = 8, Phase I-Attends; S5 = 8, Phase I-Ignoring; S6 = 8, Phase II-CI; S7 = 7, Phase II-TO; SPA = 7, Phase II – PA) throughout the remainder of treatment. These scores coincided with low caregiver sadness scores (S1 = 1, Phase I-Orientation; S2 = 1, Phase I-Attends; S3 = 1, Phase I-Attends; S4 = 1, Phase I-Rewards; S5 = 1, Phase I-Ignoring; S6 = 1, Phase II-CI; S7 = 1, Phase II-TO; SPA = 1, Phase II-PA).

Overall, Caregiver 10 started treatment with a low sadness score, which remained low throughout the entire treatment. These low scores coincided with moderate to high rates of relationship enhancing skills and moderately high ratios of child compliance. Low sadness scores also generally coincided with low levels of child defiance and moderate to high levels of caregiver warmth and caregiver-child relationship quality.

Case 11

Case 11 was 32-year-old Caucasian, divorced, female whose was the biological mother of the participating child. This family was randomized to the TEHNC group. At baseline, this Caregiver 11 reported depressive symptoms in the minimal range on the BDI-II (BDI-II = 5). At post assessment, caregiver 11 reported a 1-point increase in depressive symptoms having her remain in the minimal range (BDI-II = 6). Similarly, Caregiver 11, had a sadness score of 1 at baseline (S1 = 1, Phase I-Orientation), which remained at 1 until post assessment when the score increased to 3 (SPA = 3, Phase II-PA).

Caregiver 11 completed four sessions in Phase I; however, data from session 2 were missing. Caregiver 11's rate of use of Relationship Enhancing Skills steadily increased throughout Phase I (S1 = .4, Phase I-Orientation; S3 = 4.3, Phase I-Rewards; S4 = 6.4, Phase I-Ignoring. These increases in use of Relationship Enhancing Skills coincided with low levels of caregiver sadness (S1 = 1, Phase I-Orientation; S3 = 1, Phase I-Rewards; S4 = 1, Phase I-Ignoring).

Caregiver 11 transitioned to Phase II at session five. The child compliance ratios for Phase II sessions were 33.3 (S5 = 33.3, Phase II-CI), 75 (S6 = 75, Phase II-CI), 100 (S7 = 100, Phase II-TO), 57.1 (S8 = 57.1, Phase II-TO), and 100 (SPA = 100, Phase II-PA). While child compliance fluctuated moderately between Phase II sessions, caregiver sadness remained low (S5 = 1, Phase II-CI; S6 = 1, Phase II-CI; S7 = 1, Phase II-TO; S8 = 1, Phase II-TO; SPA = 3, Phase II-PA). Of note, at post assessment, an increase in child compliance (SPA = 100, Phase II-PA) was accompanied by an increase in caregiver sadness, SPA = 3, Phase II-PA); however, this increase in sadness was still categorized as "minimally characteristic" of sadness.

Child defiance at baseline was a 2 indicating that child behaviors were in between "not at all characteristic" and "minimally characteristic" of defiance. Child defiance remained relatively low despite slight fluctuations throughout treatment (S1 = 2, Phase I-Orientation; S3 = 1, Phase I-Rewards; S4 = 1, Phase I-Ignoring; S5 = 2, Phase II-CI; S6 = 1, Phase II-CI; S7 = 3, Phase II-TO; S8 = 2, Phase II-TO; SPA = 2, Phase II-PA). These low scores also coincided with low sadness scores (S1 = 1, Phase I-Orientation; S3 = 1, Phase I-Rewards; S4 = 1, Phase I-Ignoring; S5 = 1, Phase II-CI; S6 = 1, Phase II-CI; S7 = 1, Phase II-TO; S8 = 1, Phase II-TO; SPA = 3, Phase II-PA).

Caregiver warmth at baseline yielded a score of 4, indicative of behaviors in between

“minimally characteristic” and “somewhat characteristic” of warmth (S1 = 4, Phase I-Orientation). Caregiver warmth increased at session 3 (S3 = 7, Phase I-Rewards; S4 = 7) generally remained moderate to high for the remainder of treatment (S3 = 7, Phase I-Rewards; S4 = 7, Phase I-Ignoring; S5 = 6, Phase II-CI; S6 = 7, Phase II-CI; S7 = 8, Phase II-TO; S8 = 5, Phase II-TO; SPA = 5, Phase II-PA). In relation to caregiver sadness, sadness remained low (S1 = 1, Phase I-Orientation; S3 = 1, Phase I-Rewards; S4 = 1, Phase I-Ignoring; S5 = 1, Phase II-CI; S6 = 1, Phase II-CI; S7 = 1, Phase II-TO; S8 = 1, Phase II-TO; SPA = 3, Phase II-PA) when caregiver warmth evidenced moderate to high levels.

Caregiver-child relationship quality at baseline was a 7, indicative of a relationship that was somewhat positive. This score increased in session 3 (S3 = 8; Phase I-Rewards) before staying stable at a score of 7 for the rest of treatment sessions (S4 = 7, Phase I-Ignoring; S5 = 7, Phase II-CI; S6 = 7, Phase II-CI; S7 = 7, Phase II-TO; S8 = 7, Phase II-TO). These scores also corresponded with low sadness scores (S1 = 1, Phase I-Orientation; S3 = 1, Phase I-Rewards; S4 = 1, Phase I-Ignoring; S5 = 1, Phase II-CI; S6 = 1, Phase II-CI; S7 = 1, Phase II-TO; S8 = 1, Phase II-TO). Caregiver-child relationship quality did slightly decrease to a score of 5 in the post assessment (SPA = 5, Phase II-PA), which coincided with a slight increase in caregiver sadness (SPA = 3, Phase II-PA).

Overall, Caregiver 11 started treatment with a low sadness score, which remained low throughout treatment sessions with a slight increase at post assessment. These low scores coincided with a steady increase in relationship enhancing skills use. Greater variations in child compliance during Phase II did not coincide with any fluctuations in caregiver sadness which remained low in Phase II. Low sadness scores generally coincided with low levels of child defiance and moderate to high levels of caregiver warmth and caregiver-child relationship

quality.

Case 12

Case 12 was 29-year-old Caucasian, married, female whose was the biological mother of the participating child. This family was randomized to the HNC group. At baseline, this caregiver reported depressive symptoms in the moderate range on the BDI-II (BDI-II = 22). At post assessment, this caregiver reported a 17-point decrease in depression symptoms placing her in the minimal range (BDI-II = 5). Caregiver 12's score on the Sadness Scale was a 3 at baseline (S1 = 3, Phase I-Orientation) , which decreased and remained at 1 for the remainder of treatment sessions (S2 = 1, Phase I-Attends; S3 = 1, Phase I-Attends; S4 = 1, Phase I-Rewards; S5 = 1, Phase I-Rewards; S6 = 1, Phase I-Ignoring; S7 = 1, Phase II-CI; S8 = 1, Phase II-CI; S9 = 1, Phase II-CI; S10 = 1, Phase II-TO; S11 = 1; Phase II-TO; SPA = 1, Phase II-PA).

Caregiver 12 completed six sessions in Phase I. Caregiver used Relationship Enhancing Skills at moderate to high rates with slight fluctuations (S1 = 0, Phase I-Orientation; S2 = 7.6, Phase I-Attends; S3 = 8.2, Phase I-Attends; S4 = 10.9, Phase I-Rewards; S5 = 5.63, Phase I-Rewards; S6 = 7.38, Phase I-Ignoring). As reported earlier, caregiver sadness remained at a score of 1 for all of Phase I sessions with the exception of session 1 (S1 = 3, Phase I-Orientation).

Caregiver 12 transitioned to Phase II at session seven. The child compliance ratios for all of Phase II sessions were 100 (S7 = 100, Phase II-CI; S8 = 100, Phase II-CI; S9 = 100, Phase II-CI; S10 = 100, Phase II-TO; S11 = 100, Phase II-TO; SPA = 100, Phase II-PA). While child compliance remained at 100 during Phase II, caregiver sadness remained at 1 during Phase II.

Child defiance at baseline was a 1 (S1 = 1, Phase I-Orientation) indicating that child behaviors were "not at all characteristic" of defiance. Child defiance remained at 1 for most of treatment (S2 = 1, Phase I-Attends; S3 = 1, Phase I-Attends; S4 = 1, Phase I-Rewards; S5 = 1,

Phase I-Rewards; S7 = 1, Phase II-CI; S8 = 1, Phase II-CI; S9 = 1, Phase II-CI; S10 = 1, Phase II-TO; S11 = 1; Phase II-TO; SPA = 1, Phase II-PA) with a slight increase in session six (S6 = 2, Phase I-Ignoring). These low scores also coincided with low caregiver sadness (S1 = 1, Phase I-Orientation; S2 = 1, Phase I-Attends; S3 = 1, Phase I-Attends; S4 = 1, Phase I-Rewards; S5 = 1, Phase I-Rewards; S6 = 1, Phase I-Ignoring; S7 = 1, Phase II-CI; S8 = 1, Phase II-CI; S9 = 1, Phase II-CI; S10 = 1, Phase II-TO; S11 = 1; Phase II-TO; SPA = 1, Phase II-PA).

Caregiver warmth at baseline yielded a score of 3 "minimally characteristic" of warmth (S1 = 3, Phase I-Orientation). Caregiver warmth increased in session two (S2 = 7, Phase I-Attends) and generally remained moderate to high (S3 = 8, Phase I-Attends; S4 = 7, Phase I-Rewards; S5 = 8, Phase I-Rewards; S6 = 7, Phase I-Ignoring; S7 = 7, Phase II-CI; S8 = 6, Phase II-CI; S9 = 7, Phase II-CI; S10 = 7, Phase II-TO; S11 = 6; Phase II-TO; SPA = 8, Phase II-PA) for the remainder of treatment. In relationship to caregiver sadness, sadness remained low (S2 = 1, Phase I-Attends; S3 = 1, Phase I-Attends; S4 = 1, Phase I-Rewards; S5 = 1, Phase I-Rewards; S7 = 1, Phase II-CI; S8 = 1, Phase II-CI; S9 = 1, Phase II-CI; S10 = 1, Phase II-TO; S11 = 1; Phase II-TO; SPA = 1, Phase II-PA) when caregiver warmth evidenced moderate to high levels (2 = 7, Phase I-Attends; S3 = 8, Phase I-Attends; S4 = 7, Phase I-Rewards; S5 = 8, Phase I-Rewards; S6 = 7, Phase I-Ignoring; S7 = 7, Phase II-CI; S8 = 6, Phase II-CI; S9 = 7, Phase II-CI; S10 = 7, Phase II-TO; S11 = 6; Phase II-TO; SPA = 8, Phase II-PA).

Caregiver-child relationship quality at baseline was a 7, indicative of a relationship that was "somewhat positive". This score fluctuated between 7 and 8 for all sessions, except for session six (S6 = 5, Phase I-Ignoring). The moderate to high levels of caregiver-child relationship quality corresponded to low levels of sadness.

Overall, Caregiver 12 started treatment with a low sadness score, which remained low

throughout the entire treatment. These low scores coincided with moderate to high rates of relationship enhancing skills and high ratios of child compliance. Low sadness scores also generally coincided with low levels of child defiance and moderate to high levels of caregiver warmth and caregiver-child relationship quality.

Case 13

Case 13 was 40-year-old Caucasian, married, male whose was the biological father of the participating child. This family was randomized to the HNC group. At baseline, this Caregiver 13 reported depressive symptoms in the minimal range on the BDI-II (BDI-II = 12). At post assessment, caregiver 11 reported a 6-point increase in depressive symptoms having him remain in the minimal range (BDI-II = 6). Caregiver 13, had a sadness score of 3 at baseline (S1 = 3, Phase I-Orientation), which decreased to a score of 1 by session four (S4 = 1, Phase I-Attends) until post assessment when the score increased to 2 (SPA = 2, Phase II-PA).

Caregiver 13 completed seven sessions in Phase I. Caregiver 13's rate of use of Relationship Enhancing Skills were low for sessions one (S1 = .4, Phase I-Orientation), two (S2 = 2.8, Phase I-Attends), and three (S3 = 2.6, Phase I-Attends); however, by session four (S4 = 9.17, Phase I-Attends) the rate of use of relationship enhancing skills increased and remained at a moderate level for the remaining Phase I sessions (S5 = 4.63, Phase I-Rewards; S6 = 4.55, Phase I-Rewards; S7 = 5.4, Phase I-Ignoring). In addition, caregiver sadness decreased to 1 in session four (S4 = 1, Phase I-Attends), when the rate of use of relationship enhancing skills peaked (S4 = 9.17, Phase I-Attends). Caregiver sadness remained at 1 for the rest of Phase I as the rate of relationship enhancing skills remained at a moderate level.

Caregiver 13 transitioned to Phase II at session eight. The child compliance ratios for all of Phase II sessions were 100 (S8 = 100, Phase II-CI; S9 = 100, Phase II-CI; S10 = 100, Phase

II-CI; S11 = 100, Phase II-TO; SPA = 100, Phase II-PA). While child compliance remained at 100 during Phase II, caregiver sadness remained low during Phase II.

Child defiance at baseline was a 2 indicating that child behaviors were in between "not at all characteristic" and "minimally characteristic" of defiance. Child defiance remained relatively low despite slight fluctuations throughout treatment (S1 = 2, Phase I-Orientation; S2 = 2, Phase I-Attends; S3 = 1, Phase I-Attends; S4 = 1, Phase I-Attends; S5 = 1, Phase I-Rewards; S6 = 2, Phase I-Rewards; S7 = 1, Phase I-Ignoring; S8 = 1, Phase II-CI; S9 = 1, Phase II-CI; S10 = 1, Phase II-CI; S11 = 1, Phase II-TO; SPA = 1, Phase II-PA). These low scores also coincided with low sadness scores (S1 = 3, Phase I-Orientation; S2 = 3, Phase I-Attends; S3 = 2, Phase I-Attends; S4 = 1, Phase I-Attends; S5 = 1, Phase I-Rewards; S6 = 1, Phase I-Rewards; S7 = 1, Phase I-Ignoring; S8 = 1, Phase II-CI; S9 = 1, Phase II-CI; S10 = 1, Phase II-CI; S11 = 1, Phase II-TO; SPA = 2, Phase II-PA).

Caregiver warmth at baseline yielded a score of 4, indicative of behaviors in between "minimally characteristic" and "somewhat characteristic" of warmth (S1 = 4, Phase I-Orientation). Caregiver warmth levels generally remained moderate to high (S2 = 5, Phase I-Attends; S3 = 6, Phase I-Attends; S5 = 6, Phase I-Rewards; S6 = 6, Phase I-Rewards; S7 = 6, Phase I-Ignoring; S8 = 5, Phase II-CI; S10 = 7, Phase II-CI; S11 = 5, Phase II-TO). Caregiver did evidence large reductions in warmth at sessions four (S4 = 2, Phase I-Attends), nine (S9 = 2, Phase II-CI), and post assessment (SPA = 3, Phase II-PA). Caregiver sadness did not coincide with these fluctuations with one exception. Caregiver sadness did slightly increase at post assessment (SPA = 2, Phase II-PA) when caregiver warmth also decreased (SPA = 3, Phase II-PA).

Caregiver-child relationship quality at baseline was a 6, indicative of a relationship that

was slightly positive. This score fluctuated between 6 and 7 for the rest of treatment (S1 = 6, Phase I-Orientation; S2 = 6, Phase I-Attends; S3 = 6, Phase I-Attends; S4 = 6, Phase I-Attends; S5 = 7, Phase I-Rewards; S6 = 7, Phase I-Rewards; S7 = 7, Phase I-Ignoring; S8 = 6, Phase II-CI; S9 = 6, Phase II-CI; S10 = 7, Phase II-CI; S11 = 7, Phase II-TO; SPA = 7, Phase II-PA) These scores also corresponded with low sadness scores (S1 = 3, Phase I-Orientation; S2 = 3, Phase I-Attends; S3 = 2, Phase I-Attends; S4 = 1, Phase I-Attends; S5 = 1, Phase I-Rewards; S6 = 1, Phase I-Rewards; S7 = 1, Phase I-Ignoring; S8 = 1, Phase II-CI; S9 = 1, Phase II-CI; S10 = 1, Phase II-CI; S11 = 1, Phase II-TO; SPA = 2, Phase II-PA).

Overall, Caregiver 13 started treatment with a low sadness score, which remained low throughout treatment sessions with a slight increase at post assessment. These low scores coincided with an increase and moderate rates of use of relationship enhancing skills. High ratios of child compliance also corresponded with low levels of sadness. Low sadness scores generally coincided with low levels of child defiance and moderate to high levels of caregiver-child relationship quality. While Caregiver 13 evidenced generally moderate to high levels of warmth, there were a few sessions in which Caregiver 13 demonstrated low levels of warmth. These instances of low warmth, however, were not related to fluctuations of sadness which consistently remained low.

General Patterns

Aim 2. Depressive Symptoms Trajectories Throughout Course of Treatment

Overall, trends generally suggested reductions in depressive symptoms among caregiver as indicated on both types of depressive symptoms measures (i.e., BDI-II and Sadness Scale). First, regarding subjective measures of depressive symptoms, 53.9 % (N = 7) of caregivers reported reductions in depressive symptoms as indicated by pre- and post- scores on the BDI-II

(See Table 2). The percentage of reduction in depressive symptoms ranged from a 13 % to 88.9% symptom decrease. The average percentage of symptom reduction was 57.8 %, suggesting that on average, depressive symptoms reduced by 57.8% on the BDI-II from baseline to post assessment for the seven caregivers who reported symptom reduction at post assessment.

As demonstrated in Table 2, two caregivers did not report any changes on the BDI-II from baseline to post assessment (15.3 % of caregivers). Both these caregivers evidenced very low symptoms at baseline and, therefore, little opportunity for change (i.e., floor effect). For example, Caregiver 1 scored a 2 on the BDI-II at baseline and at post assessment, and Caregiver 3 scored a 1 on the BDI-II at baseline and at post assessment. Despite a lack of change in depressive symptoms for these two caregivers, both caregivers continued to endorse very minimal depressive symptoms.

Four caregivers reported an increase in depressive symptoms on the BDI-II from baseline to post assessment (30.8% of caregivers) (See Table 2). The percentage of depressive symptom increase ranged from a 12.5% to a 47.4% increase, with an average pre-to-post increase of 25.4 %, for these four caregivers.

With regard to objective measures of depressive symptoms, similar findings emerged. Indeed, 53.9 % (N = 7) of caregivers reported reductions in depressive symptoms as indicated by pre- and post- scores on the Sadness Scale (See Table 2). The majority of caregivers (85.7 %, N=6) evidenced a 1-point decrease on the Sadness Scale, while the remaining caregiver (14.3%, N=1) showed a 2-point decrease on the Sadness Scale. Four families (30.8% of caregivers) did not show any changes on the Sadness Scale from baseline to post assessment. Of note, all four families had a score of 1, the lowest possible score on the Sadness Scale, at baseline, producing a flooring effect for these four caregivers. Lastly, two caregivers (15.3% of caregivers)

demonstrated an increase on the Sadness Scale from baseline to post assessment, both of which evidenced a 1-point increase.

Overall, a modest trend emerged in which most caregivers demonstrated a reduction in depressive symptoms from baseline to post assessment. The magnitude of these reductions varied by measurement. For example, the percentage of reduction in depressive symptoms ranged from 13 % to 88.9% with an average of 57.8% on the BDI-II; whereas most caregivers (85.7%) who had a reduction on the Sadness Scale only evidenced a 1-point decrease.

Aim 3. Relationship Enhancing Skills Trajectory and Caregiver Depressive Symptoms in Phase I

Of the families who had evidenced overall depressive symptom reduction on the Sadness Scale (N=7), 85.7% were using Relationship Enhancing Skills at a moderate to high rate (i.e., equal to or greater than 4 Relationship Enhancing Skills per minute) by the end of Phase I (See Table 2). Of these seven caregivers, 71.4% had reduced sadness scores by the end of Phase I. In fact, of the 71.4% of caregivers, 100% had a score of 1 on the Sadness Scale, indicative of behaviors that are considered "not at all characteristic" of sadness. The remaining two families (28.6% of caregivers) did not evidence a decrease in sadness at the end of Phase I relative to baseline sadness scores, despite meeting mastery criteria (i.e., equal to or greater than 4 Relationship Enhancing Skills per minute) by the end of Phase I.

Of the caregivers who did not demonstrate change from baseline to post assessment regarding caregiver sadness (N=4), 100% of caregivers were using relationship enhancing skills at a moderate to high rate. All four of these caregivers had scores of 1 on the Sadness Scale at baseline and at the end of Phase I.

Of the caregivers who evidenced an increase in caregiver sadness from baseline to post assessment (N=2), one caregiver (50%) used Relationship Enhancing Skills at a moderate to high

rate by the end of Phase I while the other caregiver used Relationship Enhancing Skills at a low rate by the end of Phase I (See Table 3). Both caregivers, however, had low sadness scores of 1 by the end of Phase I.

Overall, most caregivers (84.6%) demonstrated moderate to high rates of use of relationship enhancing skills by the end of Phase I. Of caregivers who had sadness scores greater than 1 at baseline and could, therefore, show reductions by the end of Phase I (N = 8) 75% of caregivers evidenced a reduction in sadness scores by the end of Phase I. Of these eight caregivers, 75% were using Relationship Enhancing Skills at a moderate to high rate by the end of Phase I. For the remaining five caregivers, 80% had unchanged sadness scores at the end of Phase I compared to baseline sadness scores and 20% of caregivers showed an increase in sadness scores by the end of Phase I. Of these six caregivers, 100% used Relationship Enhancing Skills at a moderate to high rate by the end of Phase I.

These data suggest that caregivers who evidenced sadness generally saw reductions in sadness by the end of Phase I. Many caregivers who had reductions in sadness or did not have an increase in sadness scores by the end of Phase I were using Relationship Enhancing Skills at a moderate to high rate; however, low use of Relationship Enhancing Skills did not coincide with increased sadness scores at the end of Phase I.

Aim 4. Child Defiance, Caregiver Warmth, Caregiver-Child Relationship Quality and Caregiver Depressive Symptoms in Phase I

At baseline, 61.5% (N = 8) of families had sadness scores greater than 1. By the end of Phase I, 75% of those caregivers evidenced a reduction in sadness and 25% did not evidence any change. Of the 75% of caregivers who had reductions in sadness at the end of Phase I, 66.7% of caregivers had children who showed decreases in child defiance, 12.5% of caregivers had a child

who did not show change in defiance, and 12.5% of caregivers had a child who showed an increase in defiance (See Table 4). Additionally, of these 75% of caregivers, 50% showed increases in caregiver warmth and 66.7% of caregivers showed increases in caregiver-relationship quality at the end of Phase I. 50% of caregivers showed zero changes in warmth and 33.3% of caregivers showed decreases in caregiver-child relationship quality by the end of Phase I. It is worth noting, however, that two-thirds of caregivers who did not show changes in warmth were already engaging in moderate to high levels of warmth (scores equal to or greater than 5) by the end of Phase I. The 33.3% of caregivers who had reductions in caregiver-relationship quality at the end of Phase I, also had children with increases in defiance at the end of Phase I.

Of the 25% of caregivers who had sadness score greater than 1 at baseline but did not evidence reductions by the end of Phase I, 50% had a child who showed an increase in defiance and 50% had a child who showed a decrease in child defiance. 50% of caregivers also showed a decrease in warmth and caregiver-child relationship quality. The other 50% of caregivers showed no change in caregiver-child relationship quality and an increase in warmth.

Five caregivers at baseline had sadness scores equal to 1 (38.5%). All five caregivers (100%) had a sadness score of 1 at the end of Phase I as well. 80% of these caregivers had a child who scored a 1 on the Defiance Scale at the end of Phase I, while 20% of caregivers had a child who scored a 3 on the defiance scale, which was unchanged from baseline defiance scores. 80% of caregivers also demonstrated increases in warmth by the end of Phase I and 20% of caregivers showed decreases in warmth at the end of Phase I. Also, 40% of these caregivers showed increases in caregiver-child relationship qualities at the end of Phase I, 40% of caregivers showed decreases in caregiver-child relationship qualities at the end of Phase I, and 20% did not show any changes in caregiver-child relationship qualities at the end of Phase I.

Also, during Phase I, across families and sessions, 38.5 % of increases in child defiance were accompanied by increases in caregiver sadness, and 55.5% of decreases in child defiance coincided with decreases in caregiver sadness. For warmth, 66.7% of increases in caregiver warmth coincided with decreases in caregiver sadness. 66.7% of decreases in caregiver warmth also coincided with increases in caregiver sadness. Lastly, 71.4% of increases in caregiver-child relationship quality across families and sessions corresponded to decreases in caregiver sadness, and 60% of decreases in caregiver-child relationship quality corresponded to increases in caregiver sadness.

These data modestly suggested that there may be a relationship between child defiance, caregiver warmth, and caregiver-child relationship quality and caregiver sadness in the hypothesized directions for Phase I.

Aim 5. Child Compliance Trajectory and Caregiver Depressive Symptoms in Phase II

Of the families who had evidenced overall depressive symptom reduction on the Sadness Scale (n = 7) from baseline to post assessment, 85.7% of caregivers had a child who complied to at least to 85 % of issued commands by the end of Phase II (See Table 3). Of these seven caregivers, 71.4% had reduced sadness scores by the end of Phase I, which were maintained at Phase II. The remaining two families (28.6%) who did not evidence a decrease in sadness at the end of Phase I did show decreased sadness at the end of Phase II, which coincided with 100% compliance by children for both caregivers at post assessment.

Four caregivers (30.8%) did not demonstrate change from baseline to post assessment regarding caregiver sadness (n = 4). All four caregivers (100%) had a child who complied to at least to 85% of issued commands by the end of Phase II. These four caregivers (100%) had sadness scores of 1 at baseline, at the end of Phase I, and at the end of Phase II.

Of the two caregivers who evidenced an increase in caregiver sadness from baseline to post assessment (n = 2), one caregiver (Caregiver 2) had a child who complied to 75% of issued commands by the end of Phase II. Additionally, Caregiver 2 had a sadness score that had decreased at the end of Phase I and increased at the end of Phase II. The increase in sadness during Phase II coincided with a reduction in child compliance, where the child compliance ratio went from 87.5 at the beginning of Phase II to 75 at the end of Phase II. The other caregiver who had an increase in sadness by the end of treatment (Caregiver 11) had a child who complied to 100% of the issued commands at post assessment. Furthermore, Caregiver's 11 participating child had a compliance ratio that increased from the beginning of Phase II (33.3%) to the end of Phase II (100%).

These data suggest a generally trend of increased child compliance for most families. Another trend emerged in which caregivers who showed decreased sadness scores by the end of Phase II had compliance rations greater than 85. Of the families who had increased sadness score by the end of Phase II, 50% (n = 1) had a compliance ratio that was less than 85 and had decreased since the beginning of Phase II. These findings might suggest a relationship between child compliance and caregiver sadness. Findings are difficult to interpret given that most families, regardless of caregiver sadness demonstrated increased child compliance.

Aim 6. Child Defiance, Caregiver Warmth, Caregiver-Child Relationship Quality and Caregiver Depressive Symptoms in Phase II

At the start of Phase II, 23.1% (n = 3) of families had sadness scores greater than 1. By the end of Phase II, 66.7% (n = 2) of those caregivers evidenced a reduction in sadness and 33% (n = 1) did not evidence any change from the beginning of Phase II to the end of Phase II. Of the 66.7% of caregivers who had reductions in sadness at the end of Phase II, 66.7% of caregivers

had children who showed an increase in child defiance and 33.3% had a child who did not evidence changes in defiance from the beginning of Phase II to the end of Phase II. Additionally, of the caregivers who had reduced sadness scores from the beginning to the end of Phase II (66.7%), 100% showed increases in caregiver warmth and caregiver-relationship quality. The caregiver who had a sadness score greater than 1 and did not evidence any changes in sadness from the beginning of Phase II to the end of Phase II, had a reduction in warmth, and increase in defiance, and an increase in caregiver-child relationship quality.

Ten caregivers at the beginning of Phase II had sadness scores equal to 1 (76.9%). 70% (n = 7) of those caregivers still had sadness scores of 1 at the end of Phase II. Of those seven caregivers, 85.7% (n = 6) either had decreased child defiance scores from the beginning of Phase II to the end of Phase II or had child defiance score of 1 at the beginning and end of Phase II. In addition to defiance, 85.7% of these seven caregivers either had increased levels of warmth from the beginning of Phase II to the end of Phase II or did show changes in warmth during Phase II, but continued to evidence moderately high levels of warmth by the end of Phase II (i.e., score greater than or equal to 7). Regarding caregiver-relationship quality, 71.4% of these seven caregivers had increased scores on caregiver-child relationship quality from the beginning of Phase II to the end of Phase II.

Of the ten caregivers at the beginning of Phase II who had sadness scores equal to 1, 30% (n = 3) had sadness scores increase at the end of Phase II. 66.7% of those caregivers did not show any changes in child defiance from the beginning of Phase II to the end of Phase II while 33.3% of caregivers evidenced an increase in child defiance during Phase II. Regarding warmth and caregiver-child relationship quality, 66.7 % had decreased warmth and caregiver-child relationship quality scores from the beginning of Phase II to the end of Phase II. The remaining

33.3% showed an increase in warmth and caregiver-child relationship quality during Phase II.

Also, during Phase II, across families and sessions, 28.6% of increases in child defiance were accompanied by increases in caregiver sadness, and 100% of decreases in child defiance coincided with decreases in caregiver sadness. For warmth, 100% of increases in caregiver warmth coincided with decreases in caregiver sadness. 28.6% of decreases in caregiver warmth also coincided with increases in caregiver sadness. Lastly, 33.3% of increases in caregiver-child relationship quality across families and sessions corresponded to decreases in caregiver sadness, and 50% of decreases in caregiver-child relationship quality corresponded to increases in caregiver sadness.

Data showed a general trend for caregiver sadness to decrease or remain at the lowest possible scores during Phase II. Additionally, general patterns of low levels of defiance also emerged. Caregiver warmth and caregiver-child relationship quality also appeared to generally increase during Phase II. Although the data appeared to somewhat suggest a possible relationship between child defiance, caregiver warmth, and caregiver-child relationship quality and caregiver sadness in the hypothesized directions for Phase II, the decreased variability in scores in Phase II make it difficult to interpret these patterns in any definitive manner.

Discussion

This project aimed to replicate and extend existing research by examining the interrelationship of treatment course, skill mastery, and depressive symptoms among low-income caregivers of children with early onset DBDs. Although the descriptive nature of this study precludes the ability to make definitive interpretations, cautious interpretation suggests that BPT holds promise in reducing caregiver depressive symptoms, and provides a preliminary window to the possible mechanisms by which BPT may be generating such effects. As expected given prior work (e.g., Chronis-Tuscano et al., 2013; Lees & Ronan, 2008; Timmer et al., 2011), data trends revealed reductions in depressive symptoms among caregivers who completed BPT. In fact, slightly more than half of participating caregivers evidenced reductions in depressive symptoms from baseline to post assessment. Although the percentage of caregivers who reported depressive symptom reductions is somewhat lower than what has been reported in the existing literature (e.g., Chronis-Tuscano et al., 2013; Timmer et al., 2011), the primary focus of prior work has been clinically depressed caregivers or caregivers who met higher depressive symptom cutoffs than are represented in the current study. The present study, in turn, may be more representative of outpatient families seeking services for their children. Moreover, some work suggests that effecting change in mild to moderate levels of depressive symptoms is particularly important (e.g., Beeber, Schwartz, Martinez, Holditch-Davis, Bledsoe, Canuso, & Lewis, 2014; Campbell, Morgan-Lopez, Cox, & McLoyd, 2009; Feder et al., 2009). That is, whereas more severe depressive symptoms have a negative effect on parenting, the effect is typically a consistent one and, therefore, can become predictable for children to navigate; however, mild to moderate

symptoms tend to be associated with more inconsistent parenting and, in turn, are more difficult for children to predict and navigate.

Although baseline caregiver depressive symptoms were not significantly correlated with baseline use of BPT skills (i.e., Attends, Rewards, and Clear Instructions,), the magnitude of these associated were moderately large and in the expected directions with the exception of Ignoring and Time out. It was hypothesized that the presence of more depressive symptoms would be associated with lower frequency of BPT skills use at baseline. The rationale being that depressive symptoms may impair or affect positive parenting practices. These findings suggest that with more highly powered samples, baseline associations with caregiver depressive symptoms and HNC skills, namely Attends, Reward, and Clear Instructions are likely to emerge providing support for this aim. Unlike Attends, Rewards, and Clear Instruction, the HNC skills of Ignoring and Time out had either small or no correlation with caregiver depressive symptoms regardless of significant level. Upon further consideration, however, it stands to reason that most caregivers who are seeking treatment for a child with a DBD are not utilizing more sophisticated skills such as Ignoring and Time out. These findings support the broader literature of parenting and depression and further suggest that caregiver depressive symptoms may add challenges to learning and effectively implementing parenting skills, especially without clinical intervention.

In addition to baseline correlations, the present study also examined relationship enhancing skills, child compliance, and mastery and progress with the practice elements of BPT (i.e., Phase I and Phase II skills). Overall, most caregivers demonstrated moderate to high use of enhancing skill, including those who had reductions in depressive symptoms from baseline to the end of Phase I, and those who had minimal depressive symptoms at baseline and at the end of Phase I. Half of the caregivers who had increased depressive symptoms at the end of Phase I

were using relationship enhancing skills at a relatively low rate. These findings appear to hold promise for a potential association between relationship enhancing skills taught in Phase I and caregiver depressive symptoms. This relationship, however, should be interpreted with caution as most caregivers were using moderate to high rates of relationship enhancing skills, which may be partially explained by the mastery-based structure of HNC. Without formal statistical tests to isolate the variance specific to relationship enhancing skills in regard to reductions in depressive symptoms, these findings are considered preliminary and suggestive rather than conclusive.

The relationship between child compliance and caregiver depressive symptoms during Phase II were more difficult to interpret, given the reduced variability in depressive symptoms during Phase II, and the general trend of improved child compliance across all families. While most caregivers who evidenced overall reductions in depressive symptoms by the end of treatment had children who engaged in high levels of child compliance, the reductions in depressive symptoms appeared greatest at the end of Phase I and remained low during Phase II. These findings may be interpreted in two ways. Although it is possible that increased child compliance more explicitly targeted in Phase II has less of an effect on caregiver depressive symptoms, the more likely explanation is that although Phase I focuses on increasing okay behavior or behaviors caregivers want to see or see, more children tend to start to evidence substantive reductions in not okay behavior as well (McMahon & Forehand, 2003). Accordingly, explicit focus on child compliance in Phase II may serve to maintain, rather than further ameliorate, low depressive symptoms. Additionally, the small number of caregivers who had not evidenced reductions in depressive symptoms in Phase I, but evidenced reductions in depressive symptoms during Phase II, had children with improved compliance. These findings suggest that child compliance and child behavior in Phase II may still be relevant to caregiver depressive

symptoms, particularly for those who have not had major reductions in depressive symptomology prior to the start of Phase II.

Examining the proposed mechanisms of change for Phases I and II may provide additional clarification regarding the differences in depressive symptom reduction seen between Phase I and Phase II. Of note, over half of participating youth whose parents had reductions in caregiver depressive symptoms in Phase I evidenced reductions in defiant behavior. These findings extended into Phase II, such that child defiance continued to decrease or remained low during Phase II for these caregivers. Consistent with the differences in depressive symptom reduction in Phase I and Phase II, defiant behavior had greater reductions in Phase I than in Phase II, where reductions in defiant behavior from Phase I were maintained during Phase II. These findings demonstrate that decreases in caregiver depressive symptoms and maintenance of low depressive symptoms, particularly in Phase II, appear to coincide with reductions in and low levels of child defiant behavior. This trend also highlights that although the goal of Phase I is to teach parents a set of skills that will disrupt the coercive cycle by establishing a positive, mutually reinforcing relationship between the caregiver and child, processes occurring in Phase I, either skill use or improvements in caregiver-child relationship quality, maybe also affect child disruptive behavior and, perhaps, further account for changes in caregiver depressive symptoms.

Interestingly, when examining the trajectory of caregiver-child relationship quality among caregivers who had reductions in caregiver depressive symptoms during Phase I, most caregivers demonstrated improved relationship quality with participating youth. Furthermore, for the small number of caregivers who had reductions in relationship quality at the end of Phase I, they also had children with increased defiant behavior by the end of Phase I. Caregiver-relationship quality continued to improve in Phase II for caregivers with reductions in depressive

symptoms and for caregivers with low levels of depressive symptoms at the beginning of Phase II. As with Phase I, caregivers who evidenced increases in depressive symptoms by the end of Phase II, albeit a small percentage of the overall sample, had decreases in caregiver-child relationship quality. These trends provide some support that relationship quality between caregiver and child may be a potential factor accounting for changes in depressive symptoms in caregivers who complete BPT. Important to highlight as well is the potential relation between child defiance and relationship quality. Initially, the present study had provided theoretical justification for a cycle among caregiver depressive symptoms, deficits in parenting, and child disruptive behaviors. For example, a caregiver experiencing depressive symptoms may engage in less optimal parenting practices that lead to child problem behaviors. These problem behaviors may partially maintain caregivers' depressive symptoms, then again, leading to and/or maintaining negative parenting practices and so on. What remains unclear is the role that relationship quality between the caregiver and child may have within the cycle just described. For example, does increased disruptive and defiant child behavior directly affect relationship quality, and in turn, shape caregiver depressive symptoms? Further, to what extend might caregiver-child relationship quality influence caregiver depressive symptoms above and beyond child defiance and vice versa? Although the current study is not able to definitively address and disentangle these possibilities, findings begin to highlight the intricacies of processes and mechanisms of change occurring within BPT.

Given the potential interrelationship of Phase I skills and a broader positive parenting, this study also examined warmth. During Phase I, most caregivers who had low levels of depressive symptoms at baseline and caregivers who showed reductions in depressive symptoms by the end of Phase I had increased levels of caregiver warmth. This trend remained evident in

Phase II where caregivers with reduced depressive symptoms either maintained moderate to high levels of warmth or showed increased levels of warmth by the end of Phase II. Conversely, caregivers who had increased depressive symptoms in Phase I and/or Phase II engaged in lower levels of warmth by the end of the corresponding Phase. The patterns in the data provide preliminary evidence that caregiver warmth may be another mechanism operating through BPT to account for potential alleviation of caregiver depressive symptoms.

Consistent with the pilot and descriptive analytic approach, findings should be considered preliminary. First, as noted earlier, limitations in sample size and methods precluded more nuanced statistical models that included lagged effects and partial variance of specific study variables (e.g., caregiver warmth, child defiance, caregiver-child relationship quality on caregiver depressive symptoms), significance testing, and, in turn, definitive conclusions. Second, the limited range in caregiver sadness made identification of patterns more challenging, which warranted cautious and modest interpretations than was preferred. Third, although examining study hypotheses among low-income families may strengthen the present study as will be discussed below, certain limitations exist and should be acknowledged. As highlighted above, low-income caregivers are at greater risks for psychopathology, including depression/depressive symptoms (see Conger & Donnellan, 2007; Dekovic et al., 2011; Goodman & Gotlib, 1999; Jones et al., 2013; Lundahl et al., 2006; Piquero, Farrington, Welsh, Tremblay, & Jennings, 2009, for reviews). This study has argued that caregiver depressive symptoms may be associated with child disruptive behaviors; however, there may be additional factors, such as financial stress or single parent status that may be causing and/or worsening depressive symptoms, particularly among low-income families. It is possible that the impact of BPT on caregiver depressive symptoms may vary if the primary factors driving these depressive

symptoms are external (e.g., financial stress, single-parenting, neighborhood danger, etc.) to the parent-child relationship (e.g, child conduct problems). Future work should aim to evaluate the effectiveness of BPT on caregiver depressive symptoms, while also examining the role of external stressors.

Despite these limitations, the study also has several strengths. First, the case series and descriptive analytic approach provided an opportunity to capitalize on the richness of a small sample by examining potential patterns driving secondary therapeutic gains among caregivers in a treatment targeting a childhood disorder. Second, this study integrated several disparate, but interrelated, lines of research to extrapolate how and why BPT may have cascading effects for depressive symptomology in caregivers. This approach is consistent with calls for treatment models that target multiple symptom clusters offering, in this case, a potentially cost-effective, first-line treatment for clusters of mood and behavior problems in multiple family systems. Third, the present study used observational and coding data, a gold-standard in family-based research, but underutilized in studies of the most vulnerable families, to examine patterns of associations and change *throughout* the course of treatment (see Murry, Bynum, Brody, Willert, & Stephens, 2001, for a review). Fourth, the present study examined study hypotheses among low-income families who are more likely to have a child with an early onset DBD, as well as psychopathology in other members of the family, including caregiver depression (see Conger & Donnellan, 2007; Dekovic et al., 2011; Goodman & Gotlib, 1999; Jones et al., 2013; Lundahl et al., 2006; Piquero, Farrington, Welsh, Tremblay, & Jennings, 2009, for reviews). These families, in turn, may be more representative of families seeking services in community mental health setting, underscoring the applicability and relevance of this work.

That said, empirical research is needed to further validate the patterns of associations

proposed here. In fact, most intervention studies in general, and parenting intervention research in particular, fail to statistically test the hypothesized mechanism through which the treatment is expected to work (e.g., Forehand, Parent, & Jones, 2013; Kazdin, 2007; Kazdin, 2009). Moreover, those that do tend to rely on tests of mediation or analyses of how a hypothesized intervening variable accounts for the link between intervention and outcome; however, mediation analyses do not necessarily provide information regarding "how" the intervening process or processes unfold in the context of interventions (i.e., mechanisms; Kazdin, 2007). As such, studies of the mechanisms proposed here should be conducted in such a way to maximize the knowledge gleaned, including simultaneously testing mechanisms in a single study to cost-effectively evaluate likely plausibility of one versus others within and between studies (Kazdin, 2009). In addition, such studies should be able to establish that the mechanism is indeed changing before and, in turn, causing changes in the outcome, a scenario that may rely on more frequent assessments than typical pre-to-post treatment designs (Kazdin, 2009).

Finally, the potential added risk for treatment dropout for depressed caregivers of children with externalizing problems merits further attention as well. Treatment drop-out for families is high as it is, and drop-out rates for BPT are no exception, with the highest drop-out rates for those families who may need and benefit most (e.g., Kazdin, 2000; Leijten et al., 2013; Lundahl et al., 2006). It stands to reason that clinicians may need to find additional ways to support caregivers with even mild to moderate levels of depressive symptoms. For example, standard, but flexible, use of BPT may involve therapists providing more verbal reinforcement and praise to parents with mild to moderate depressive symptoms who may struggle with skill progress and mastery, as well as an increased number of sessions to achieve mastery, in order to boost parenting-efficacy and confidence. Similarly, therapists may emphasize higher levels of

warmth (e.g., positive reinforcement in the form of “Attends” and/or verbal and physical “Rewards) with parents of children and adjust their coaching to help caregivers understand the dual purposes of their BPT skills. Ultimately, continued research on the mechanisms accounting for cascading effect of BPT on caregiver depressive symptoms may help guide the flexible use of BPT with the goal of retaining depressed caregivers.

Building upon future research directions, a corollary and critical clinical question remains, and that is whether standard BPT, at least as a first-line approach, will suffice in families coping with comorbid psychopathology or when concurrent or sequential child- and/or caregiver-directed services would be necessary. In an age when randomized control trials, which remain the gold standard, take more than 5 years to yield usable results, and the grant support for such work has decreased substantially, it is unlikely that research conducted to reflect every iteration of comorbidity within and between families of young children with DBDs will be feasible. There are, however, recommendations for more idiographic, functional models of assessment that may lend themselves quite well to further understanding for whom the potential cascading effects of BPT may be most beneficial (O’Brian, Haynes, & Kaholokula, 2016; Silverman & Kearney, 1991). The extent to which parent and/or child behavior, as well as parent-child interactions, are functioning to maintain and/or exacerbate depressive symptoms in caregivers, as well as DBDs, may predict which families will be most likely to benefit from the secondary effects of BPT.

Table 1: Bivariate correlations among BDI-II, Sadness Scale, Attends, Rewards, Ignoring, Clear Instructions, and Time out as baseline

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1. BDI-II	--	.05	-.48	-.43	.09	-.47	--
2. Sadness Scale	--	--	-.39	-.03	.38	-.49	--
3. Attends	--	--	--	-.69**	-.04	.53	--
4. Rewards	--	--	--	--	-.15	.08	--
5. Ignoring	--	--	--	--	--	-.21	--
6. Clearn Instructions	--	--	--	--	--	--	--
7. Time out	--	--	--	--	--	--	--

**$p < .01$

Table 2: BDI-II scores at baseline and post assessment. Sadness scores at baseline, end of phase I, and end of phase II.

Caregiver	*[a]BDI-II B*	*[b]BDI-II PA*	*[c]Sadness B*	*[d]Sadness PI*	*[e]Sadness PII*
1.	2	2	2	1	1
2.	10	19	2	1	3
3.	1	1	3	2	2
4.	14	9	1	1	1
5.	7	8	1	1	1
6.	18	2	2	2	1
7.	10	4	1	1	1
8.	15	13	2	1	1
9.	5	1	3	2	2
10.	11	16	1	1	1
11.	5	6	1	1	3
12.	22	5	3	1	1
13.	12	6	3	1	2

[a] Beck Depression Inventory-II at baseline [b]Beck Depression Inventory-II at baseline [c] Sadness Scale score at baseline [d]Sadness Scale score at end of Phase I [e]Sadness Scale score at end of Phase II

Table 3: Relationship Enhancing Skills at baseline and end of phase I. Child Compliance at beginning of phase II and post assessment.

Caregiver	[a]*RES B*	[b]*RES PI*	[c]*CC PII*	[d]*CC PA*
1.	2	11.3	0	100
2.	0	3.5	87.5	75
3.	.3	0.8	90	100
4.	.2	8.3	100	100
5.	.6	6.8	47.1	92.3
6.	.2	4.7	90.9	100
7.	.3	7.1	100	93.3
8.	.4	2	50	66.7
9.	.6	4.2	81.3	100
10.	0	8	94.7	84.6
11.	.4	6.4	33.3	100
12.	0	7.4	100	100
13.	.4	5.4	100	100

[a] *Relationship Enhancing Skills at baseline* [b]*Relationship Enhancing Skills at end of Phase I*
[c]*Child Compliance at beginning of Phase II* [d]*Child Compliance at Post Assessment*

Table 4: Mechanism of change variables at baseline, end of phase I, and end of phase II

Caregive	[a]*Def_B*	[b]*Def_PI*	[c]*Def_PII*	[d]*RQ_B*	[e]*RQ_PI*	[f]*RQ_PII*	[g]*Warmth_B*	[h]*Warmth_PI*	[j]*Warmth_PII*
1.	5	1	1	7	8	8	6	8	7
2.	7	1	6	5	6	5	3	3	5
3.	3	1	5	6	6	7	5	6	5
4.	1	1	1	9	7	9	7	4	8
5.	1	1	1	7	8	5	4	8	4
6.	2	1	3	7	7	7	4	3	7
7.	3	3	4	6	3	6	4	7	4
8.	3	1	1	5	7	8	2	4	7
9.	1	1	2	6	5	6	2	3	4
10.	3	1	1	4	8	7	5	7	7
11.	2	1	2	7	7	5	4	7	5
12.	1	2	1	7	5	8	3	7	8
13.	2	1	1	6	7	7	4	6	3

[a]*Defiance at Baseline* [b]*Defiance at end of Phase I* [c]*Defiance at end of Phase II*
[d]*Caregiver-Child Relationship Quality at Baseline* [e]*Caregiver-Child Relationship Quality at End of Phase I*
[f]*Caregiver-Child Relationship Quality at end of Phase II* [g]*Warmth at Baseline* [h]*Warmth at end of Phase I*
[j]*Warmth at end of Phase I*

Figures

Figure 1. Caregiver 1 plots of study variables.

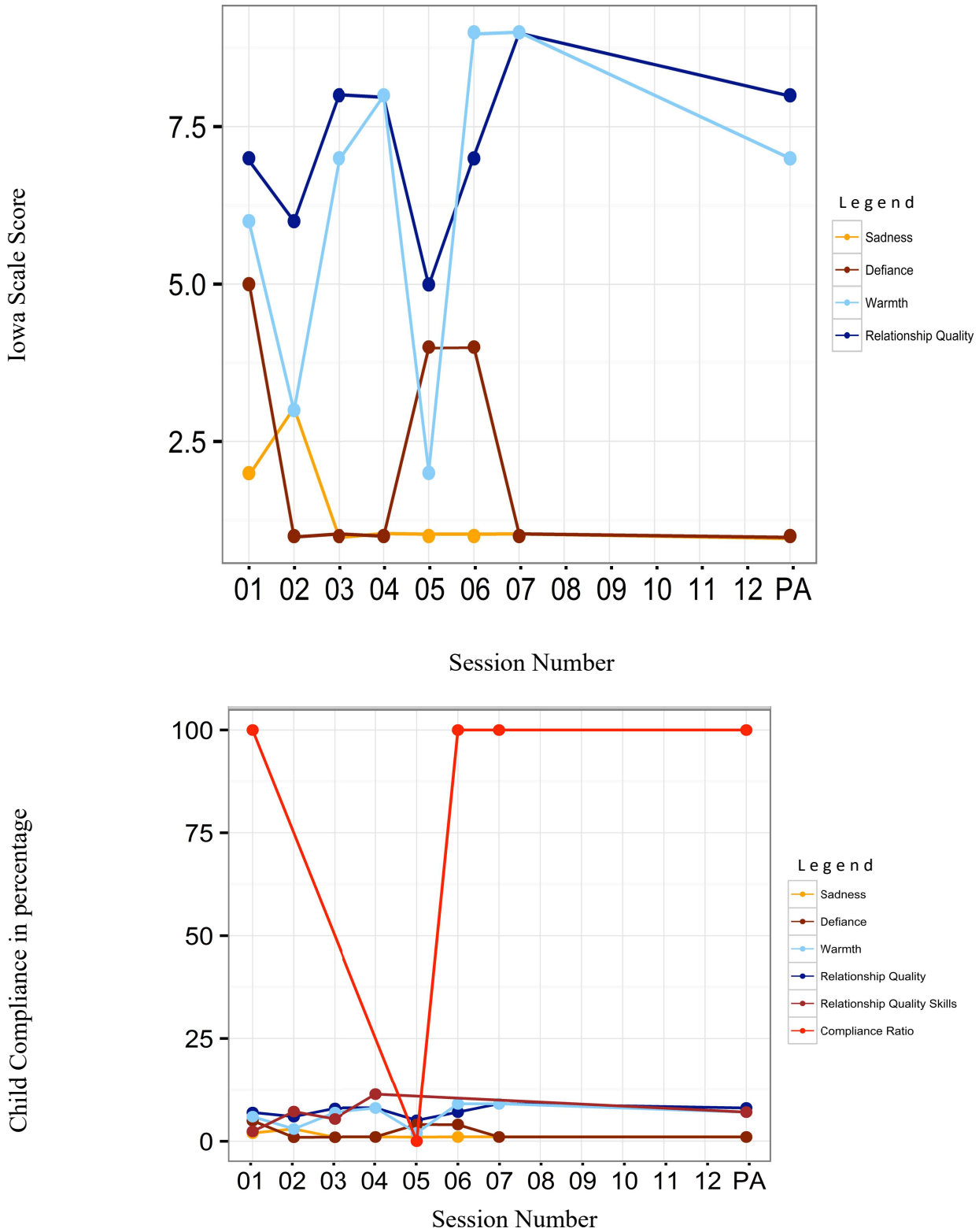
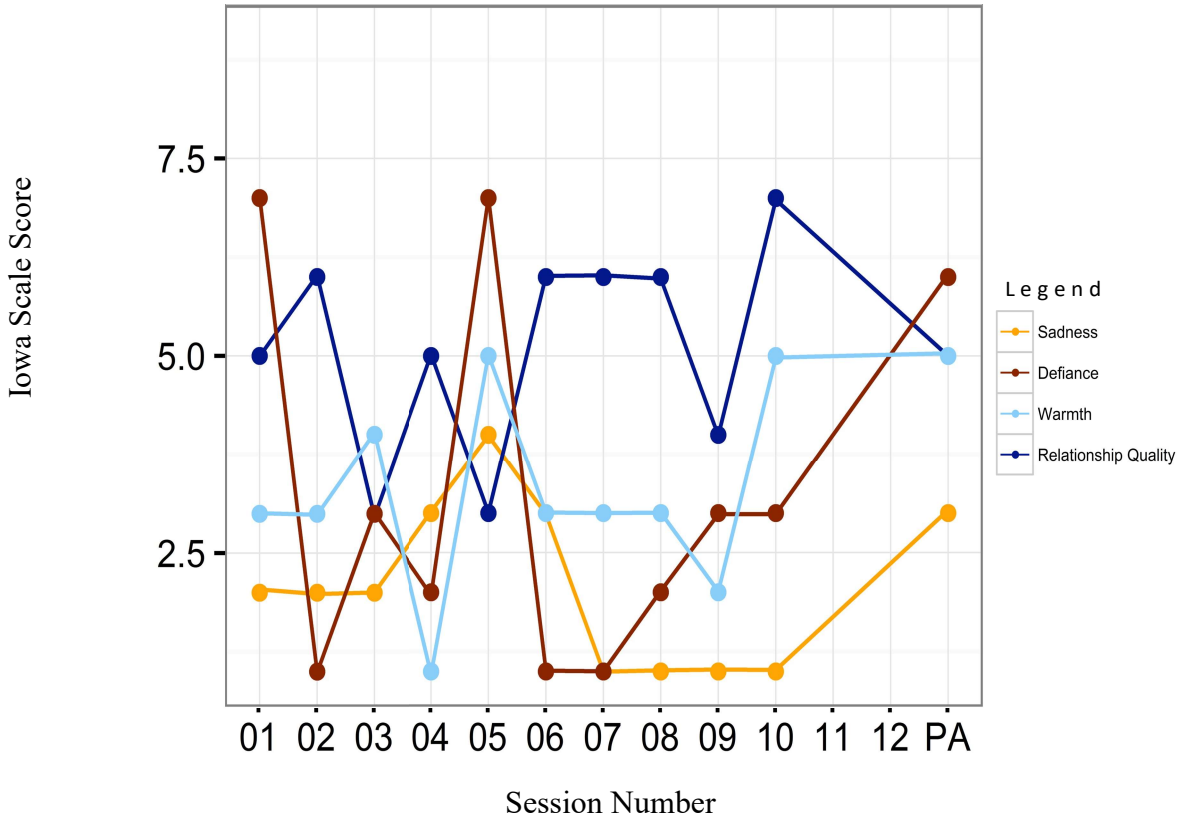


Figure 2. Caregiver 2 plots of study variables



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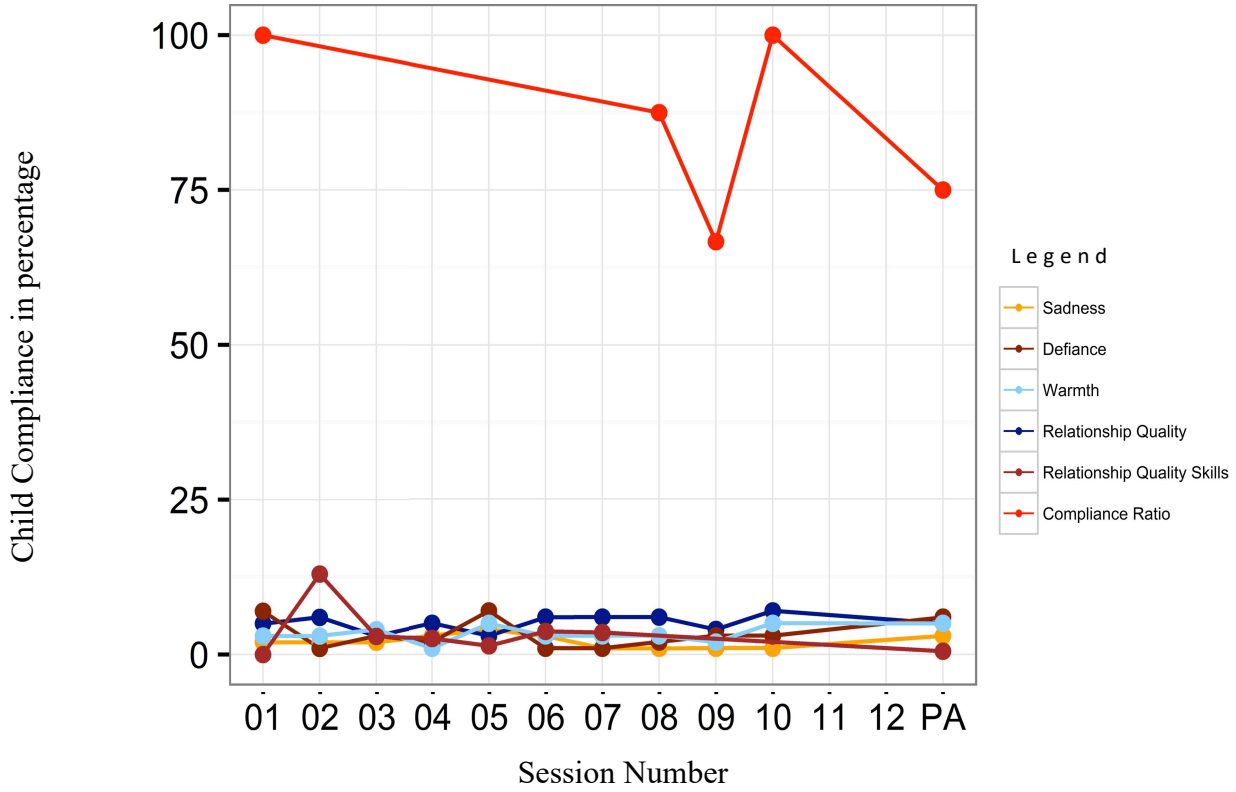
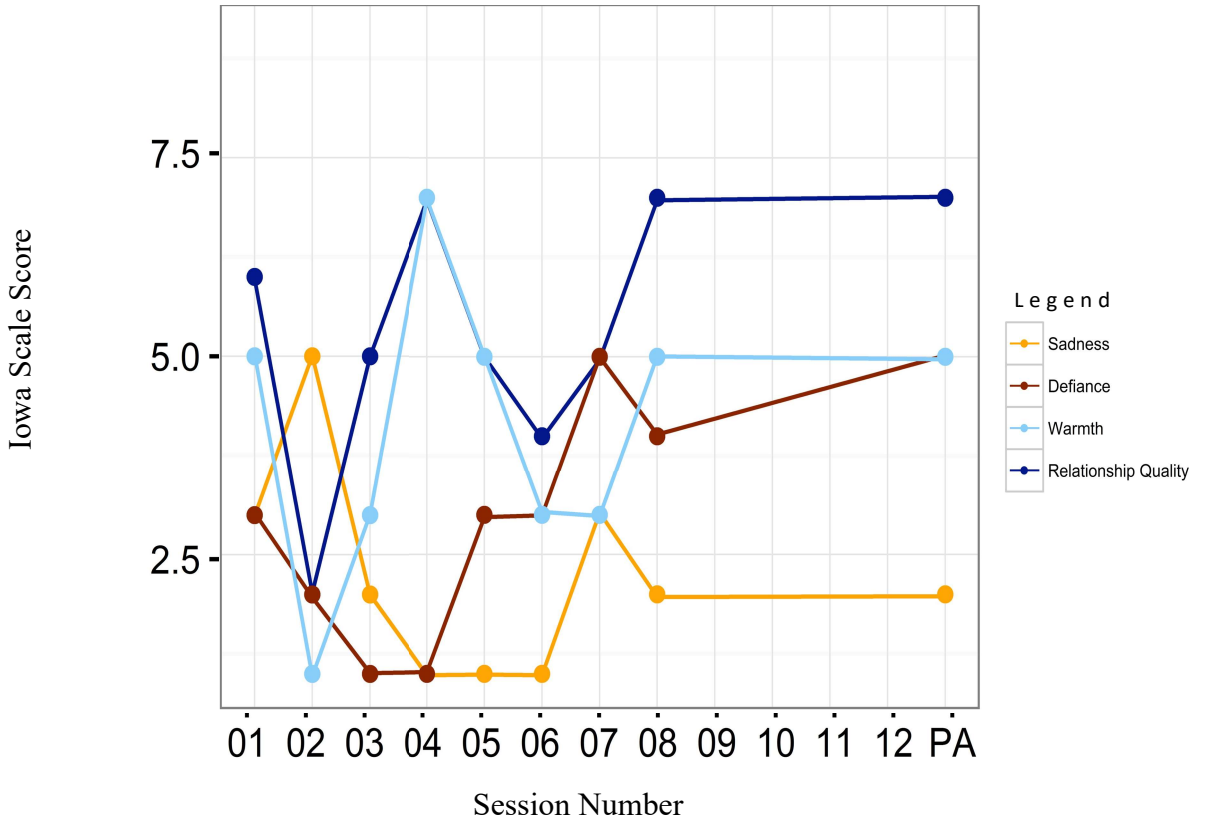


Figure 3. Caregiver 3 plots of study variables.



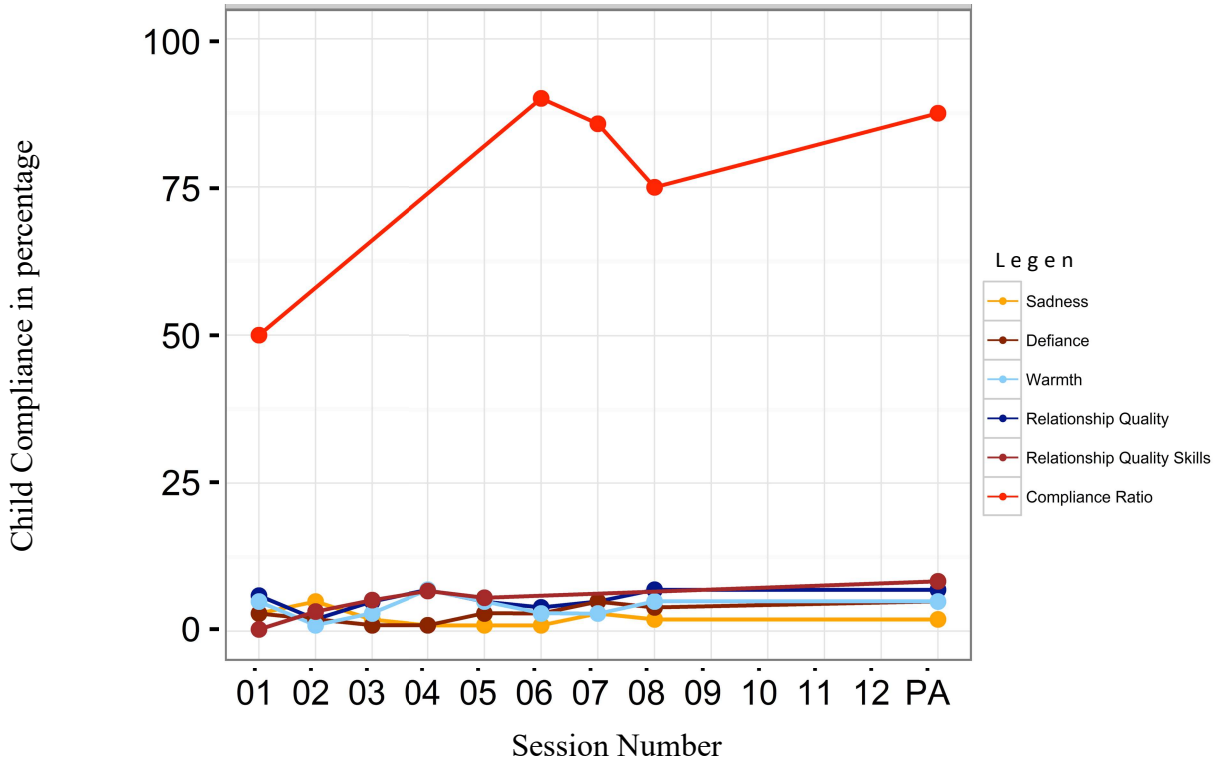
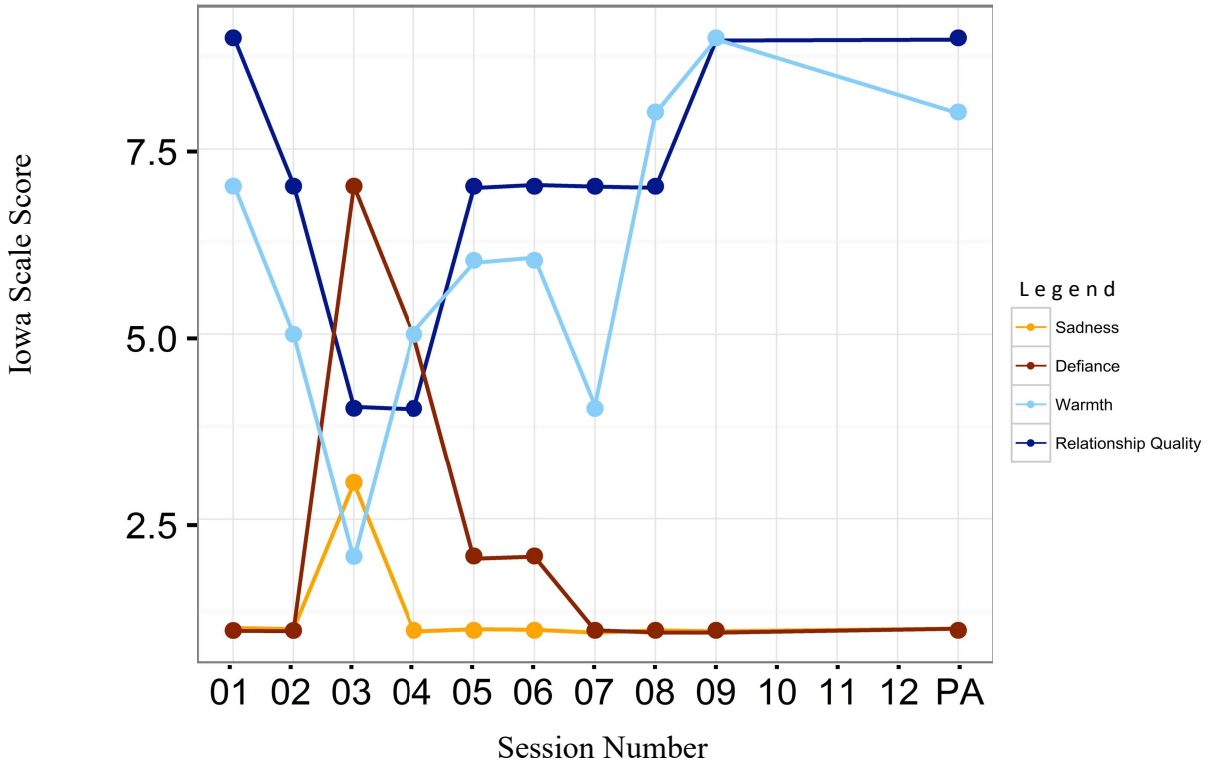


Figure 4. Caregiver 4 plots of study variables.



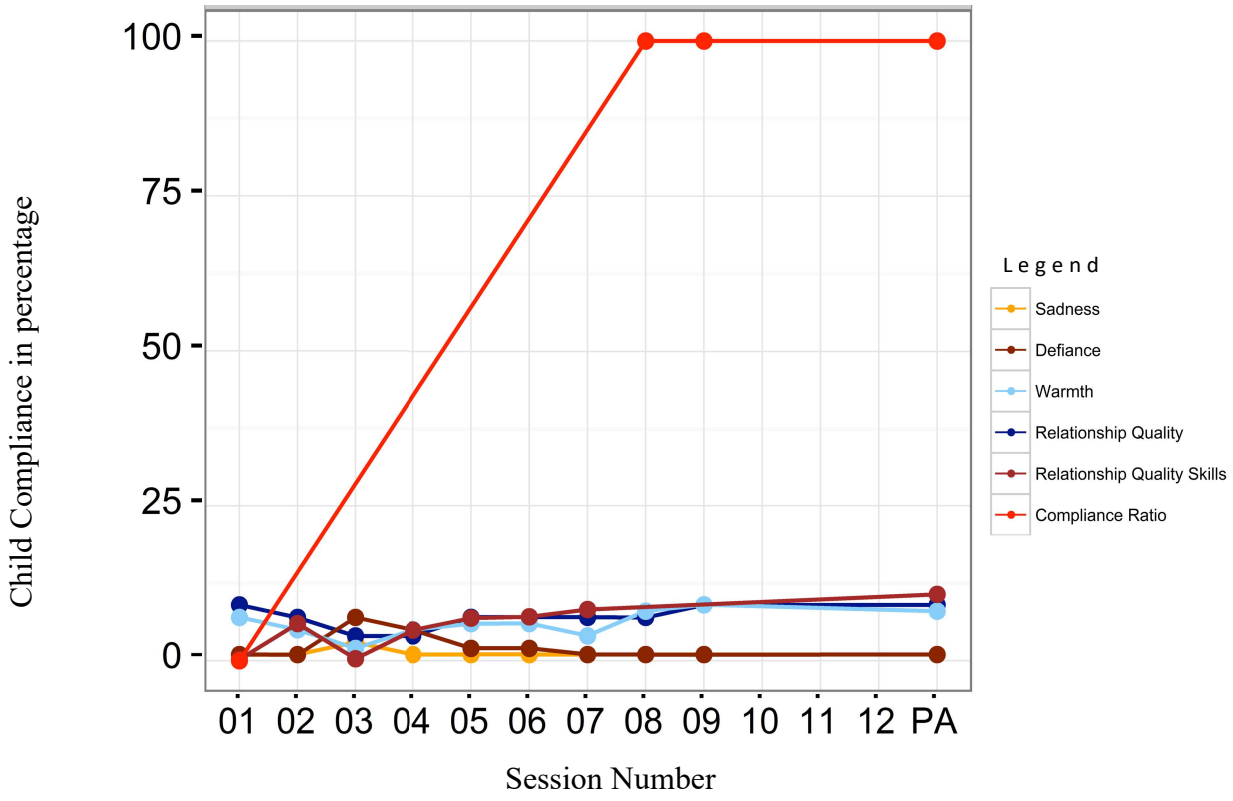
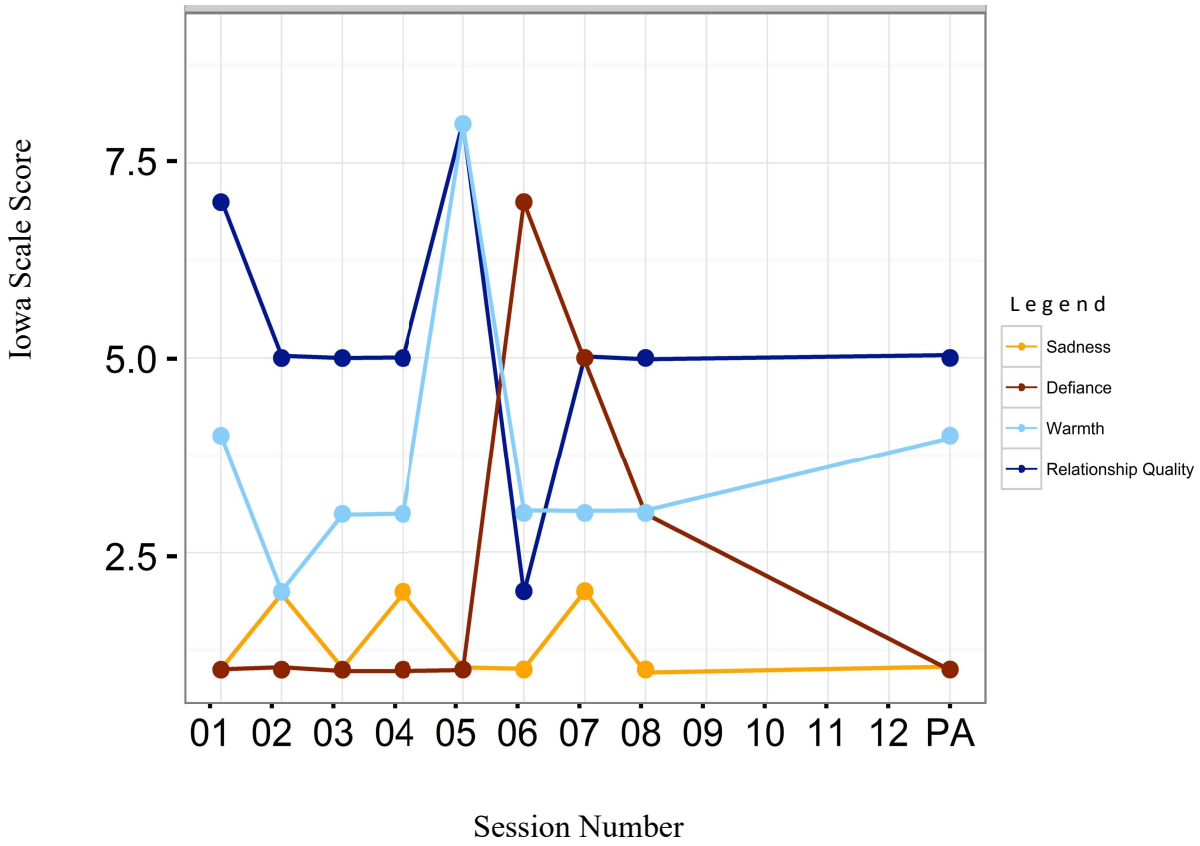


Figure 5. Caregiver 5 plots of study variables.



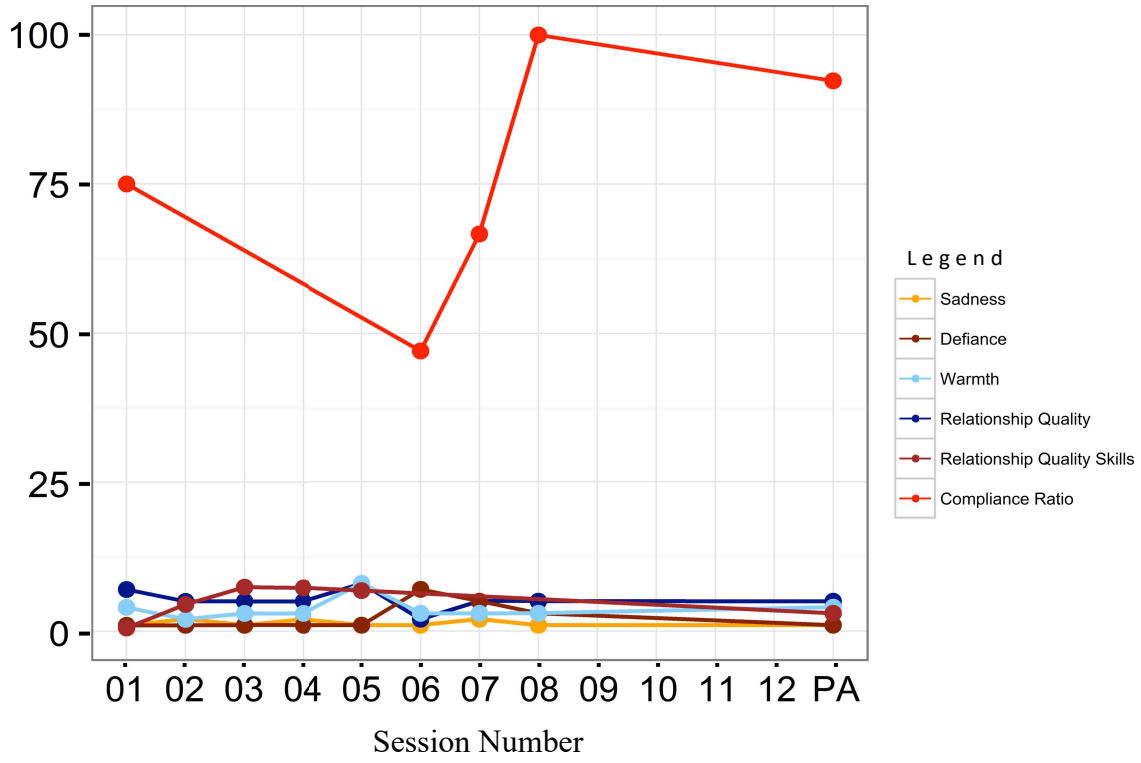


Figure 6. Caregiver 6 plots of study variables.

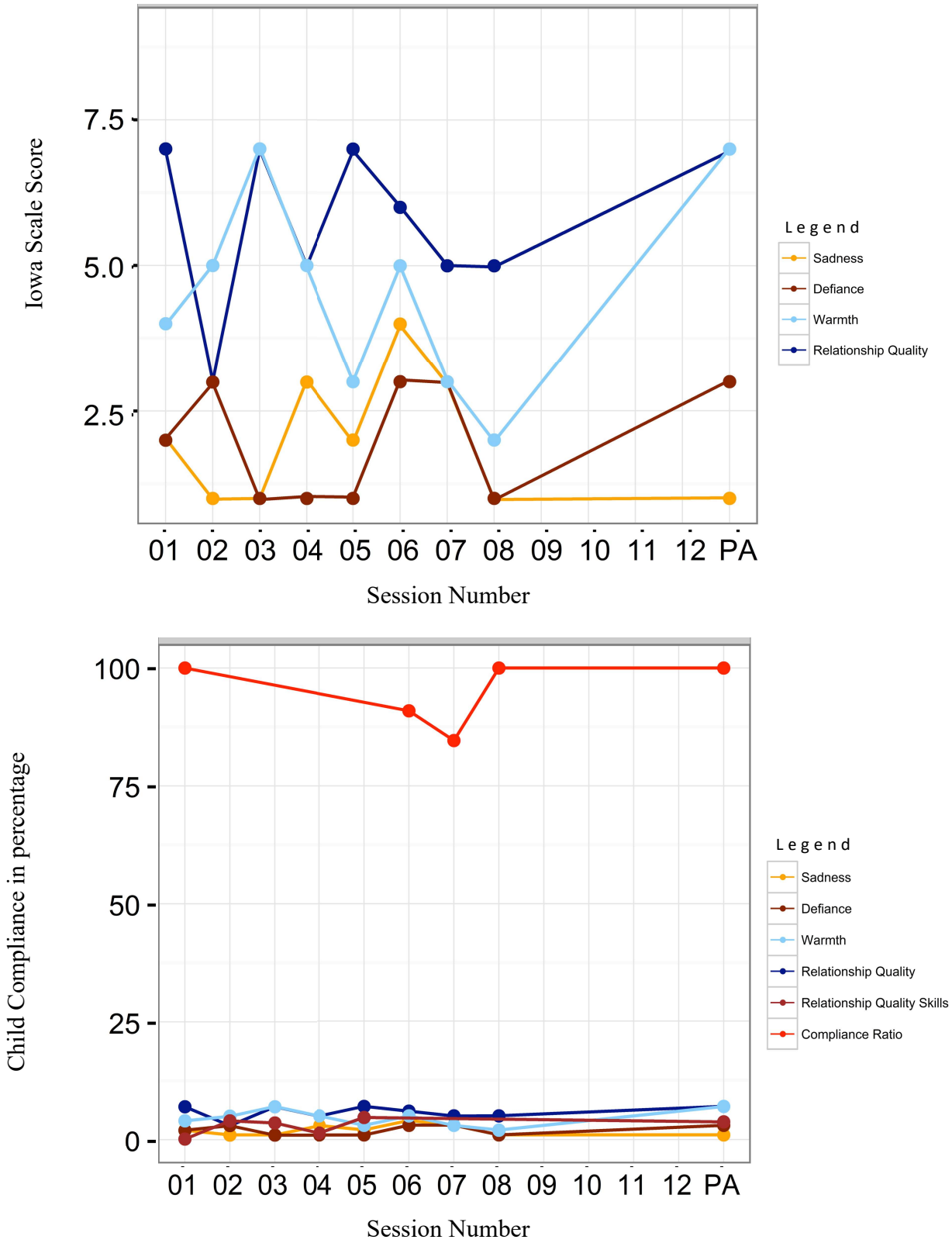
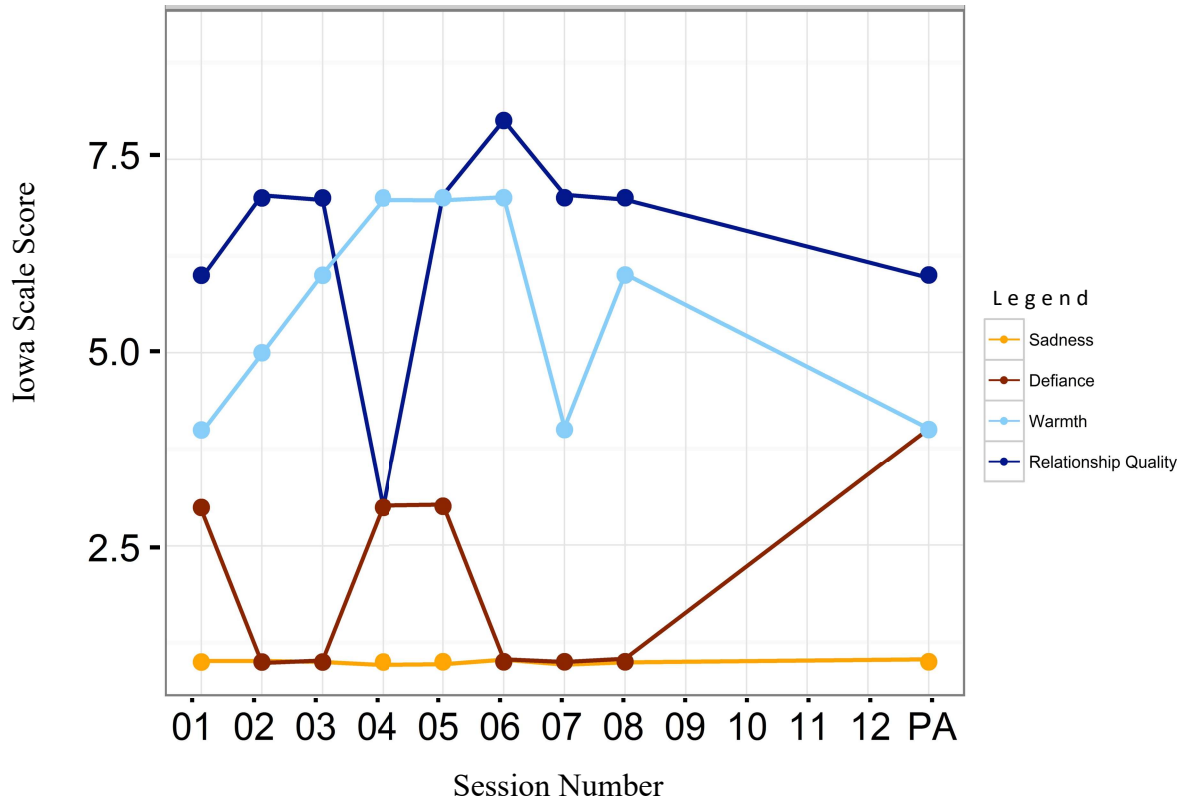


Figure 7. Caregiver 7 plots of study variables.



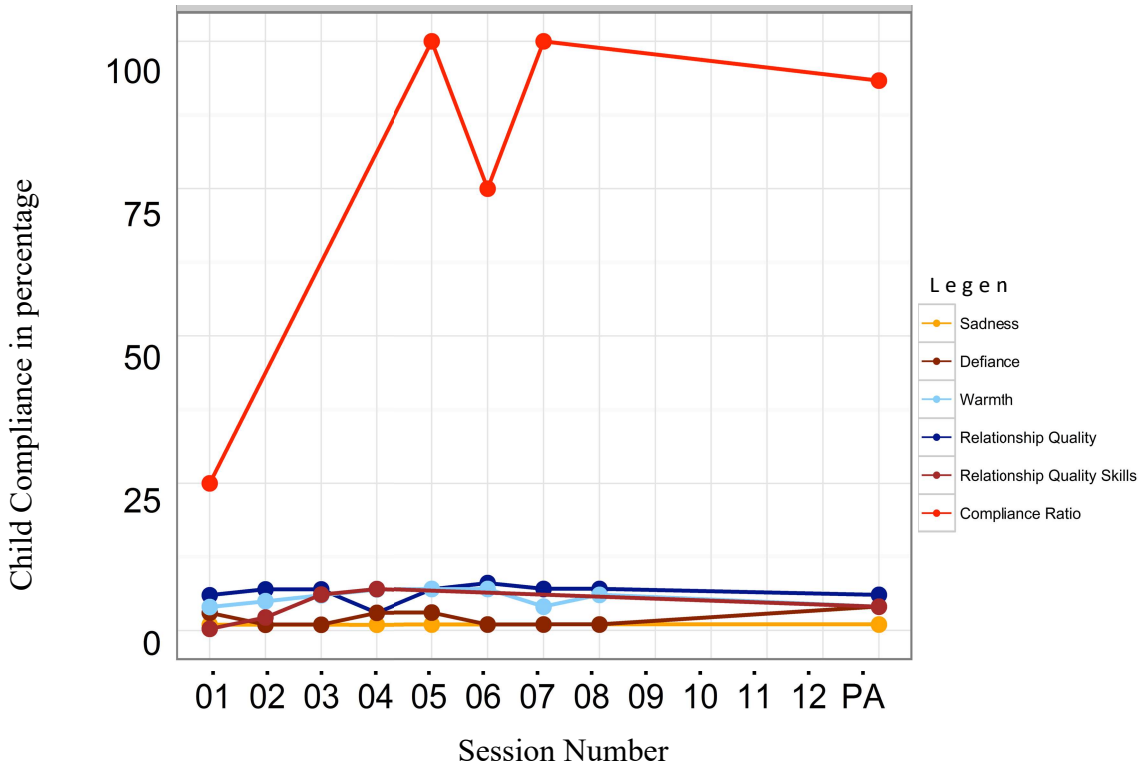


Figure 8. Caregiver 8 plots of study variables.

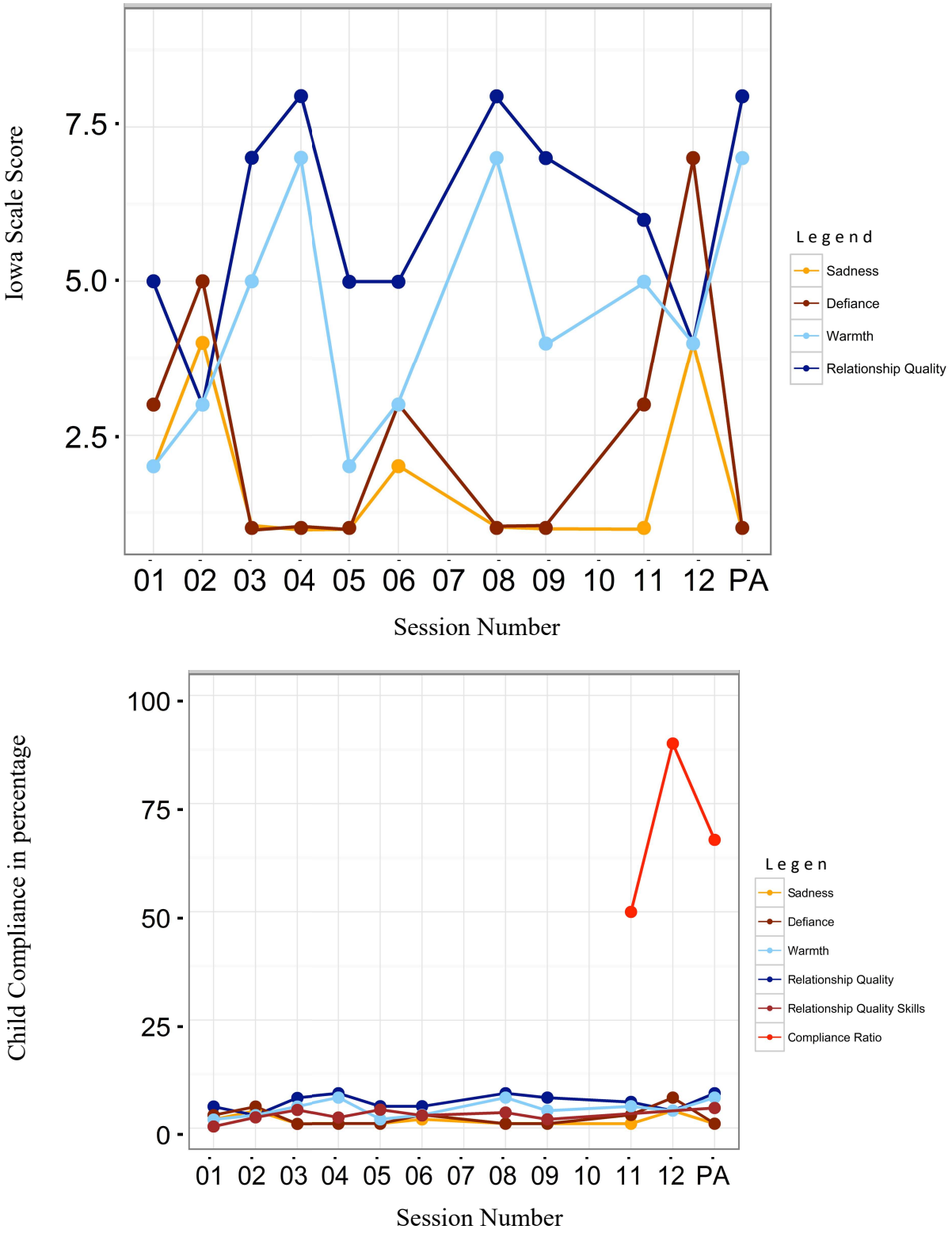


Figure 9. Caregiver 9 plots of study variables.

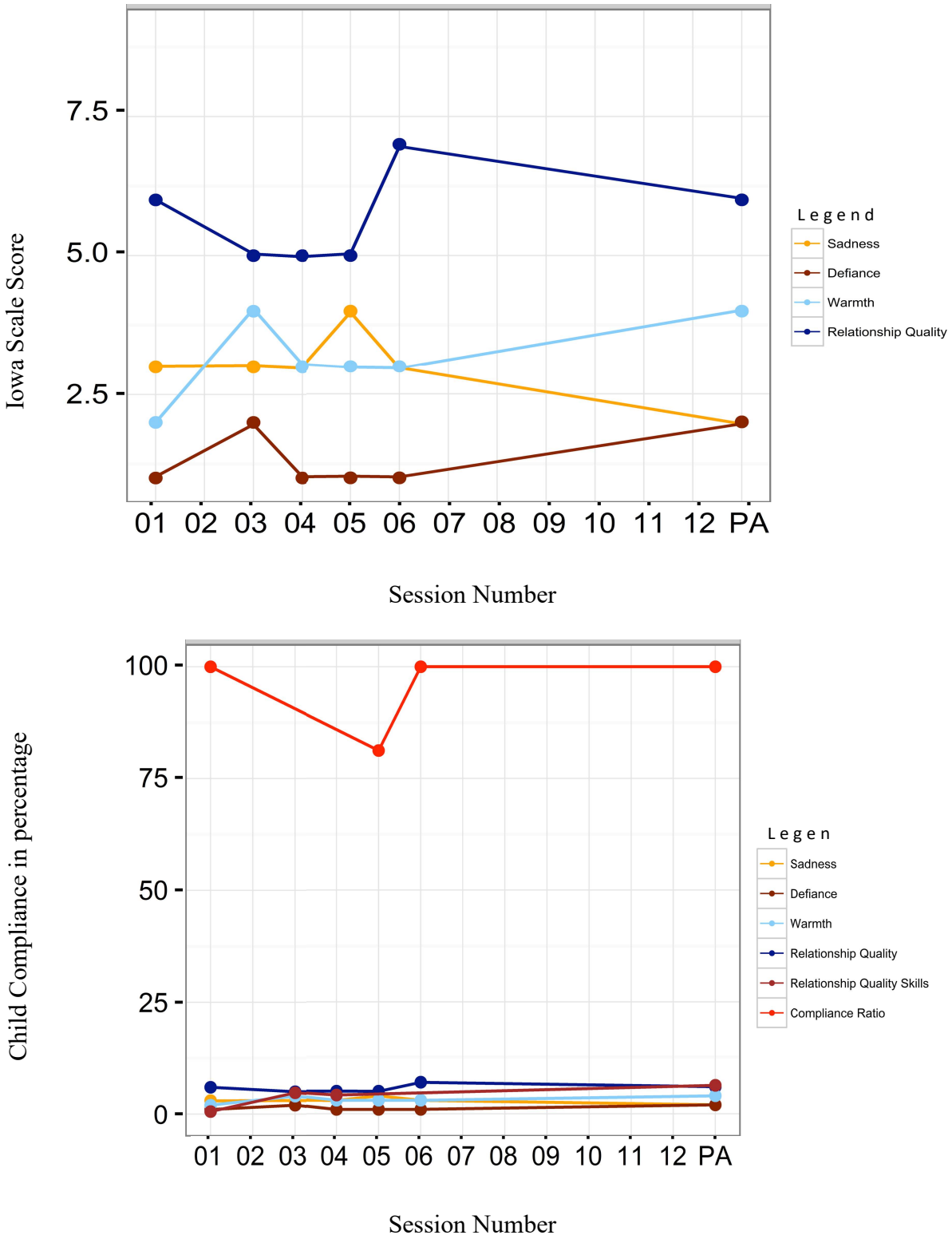
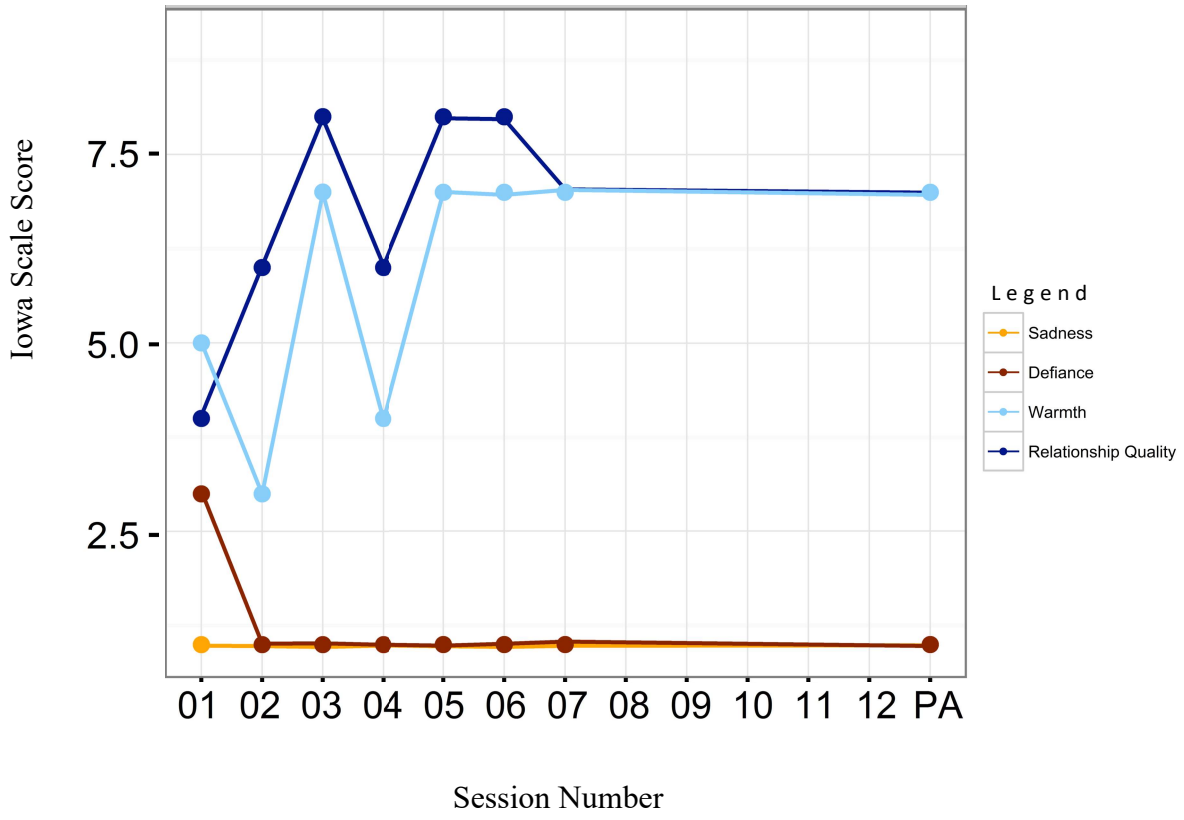


Figure 10. Caregiver 10 plots of study variables.



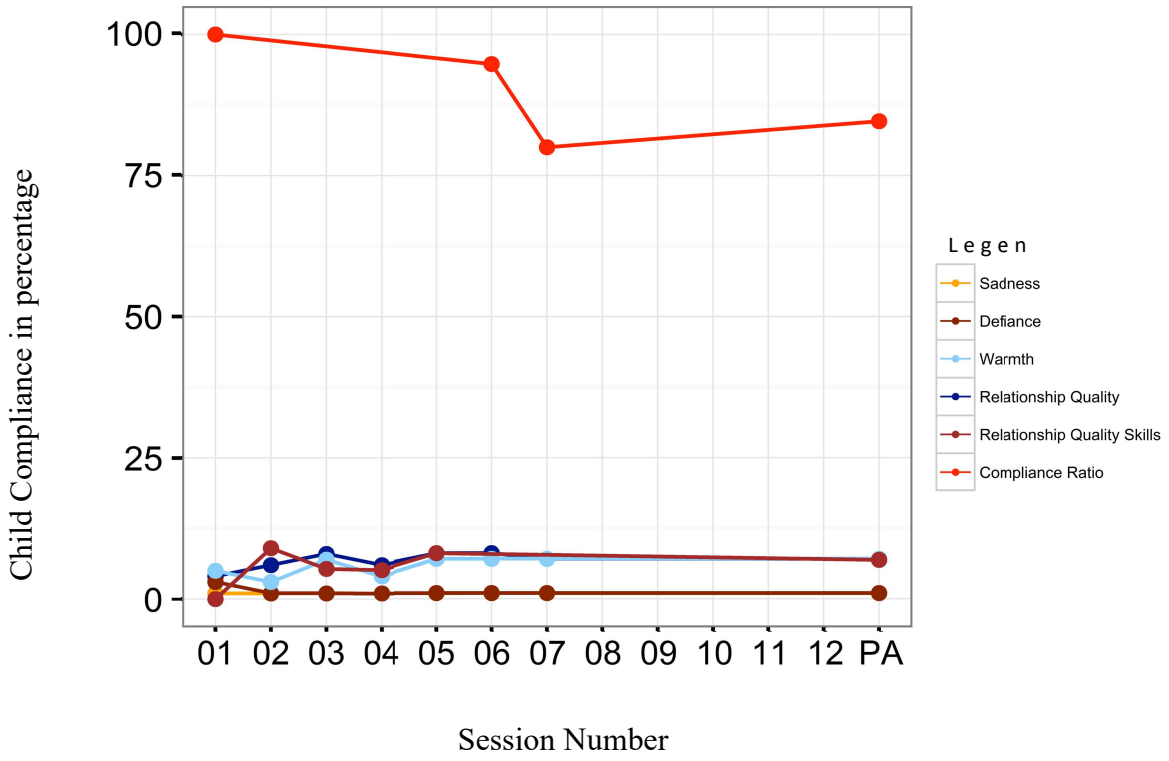


Figure 11. Caregiver 11 plots of study variables.

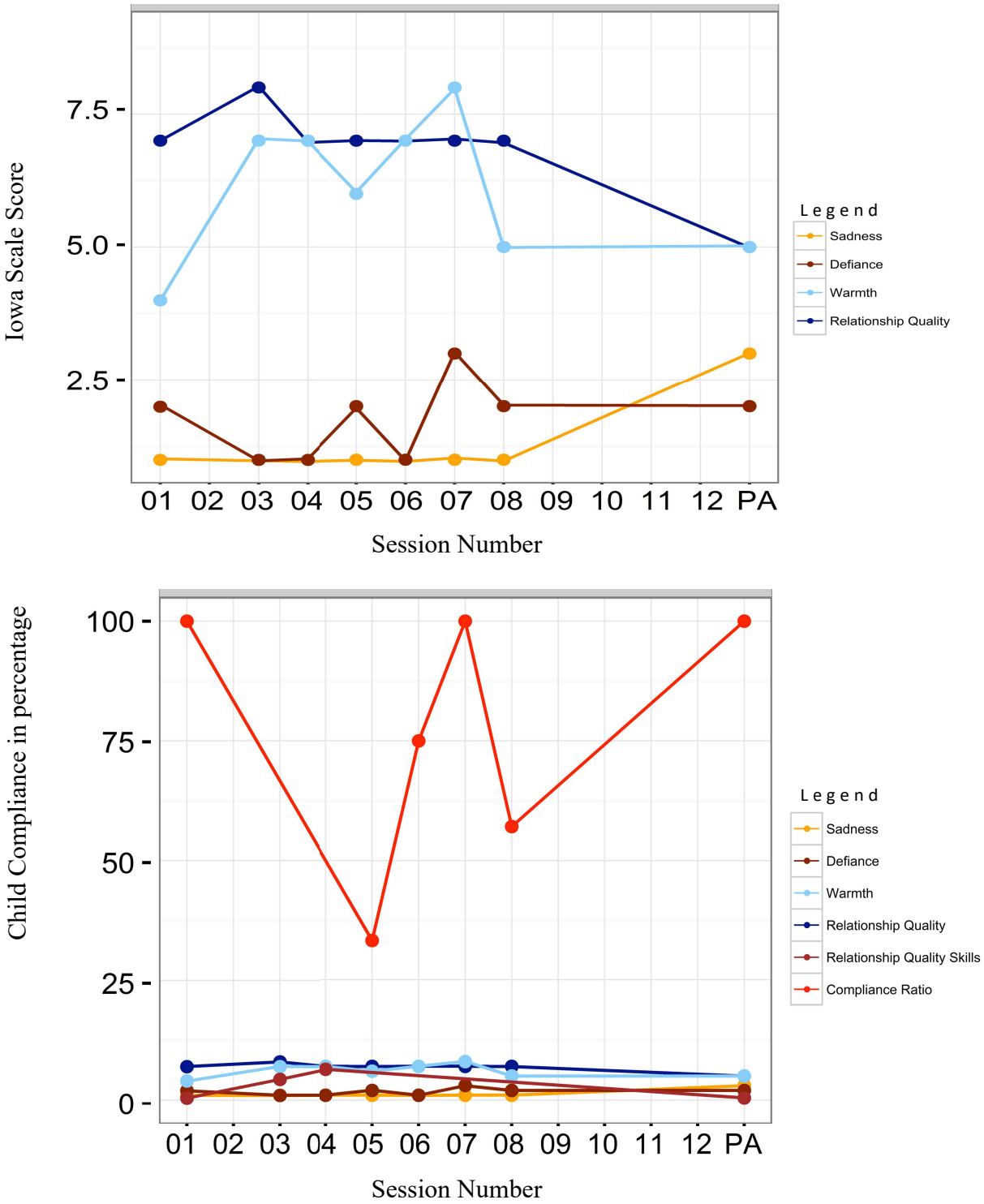
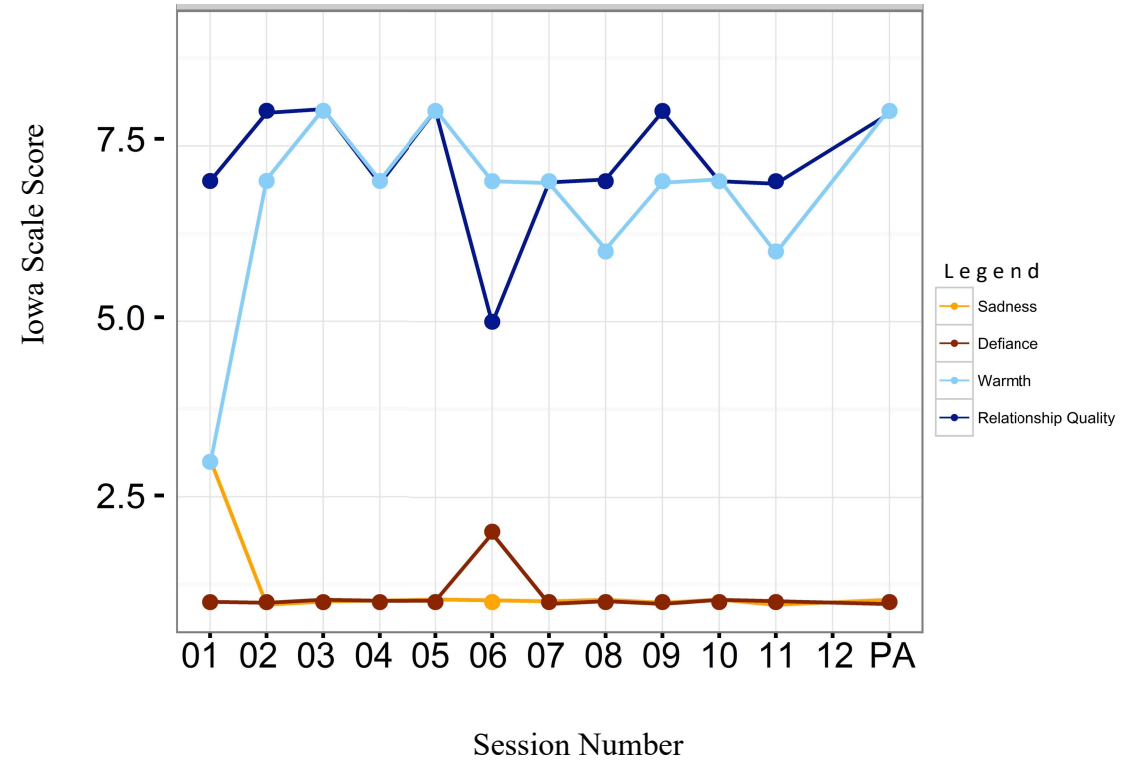


Figure 12. Caregiver 12 plots of study variables.



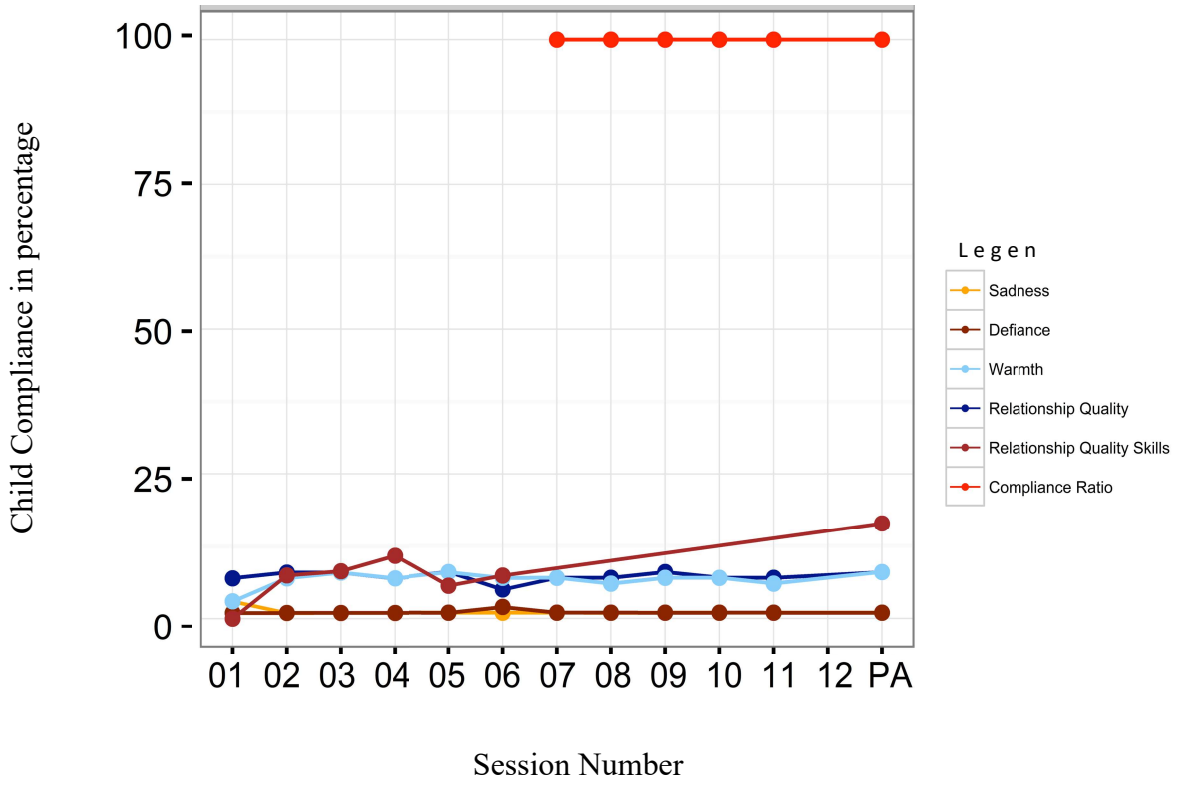
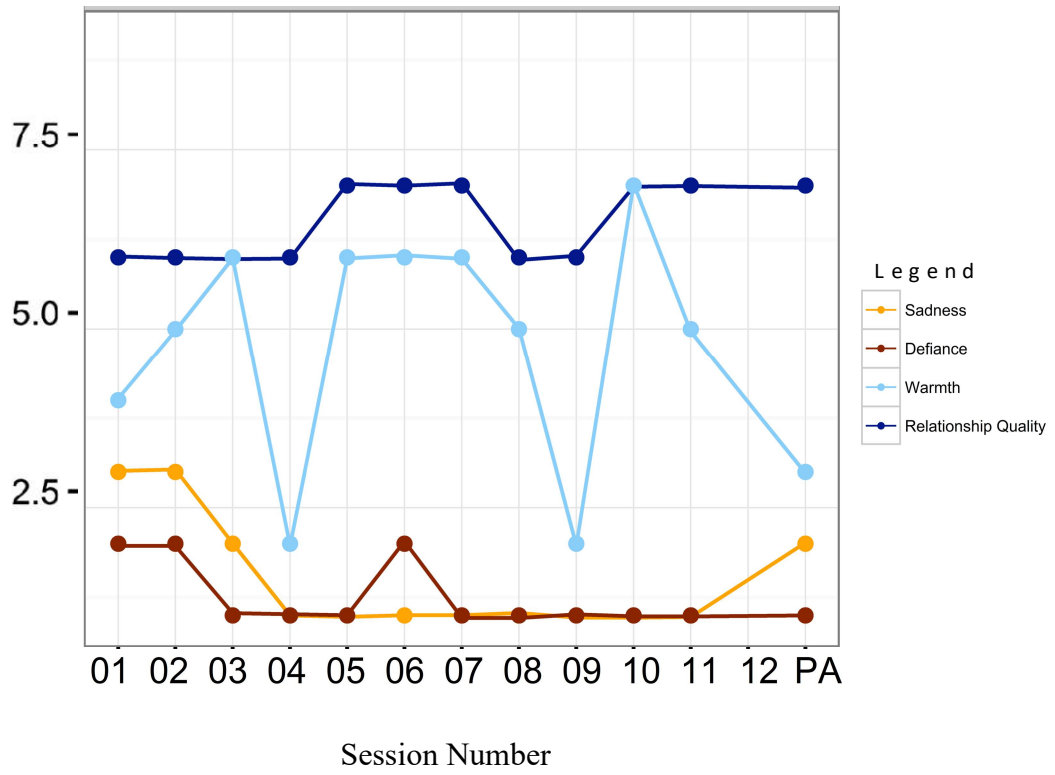
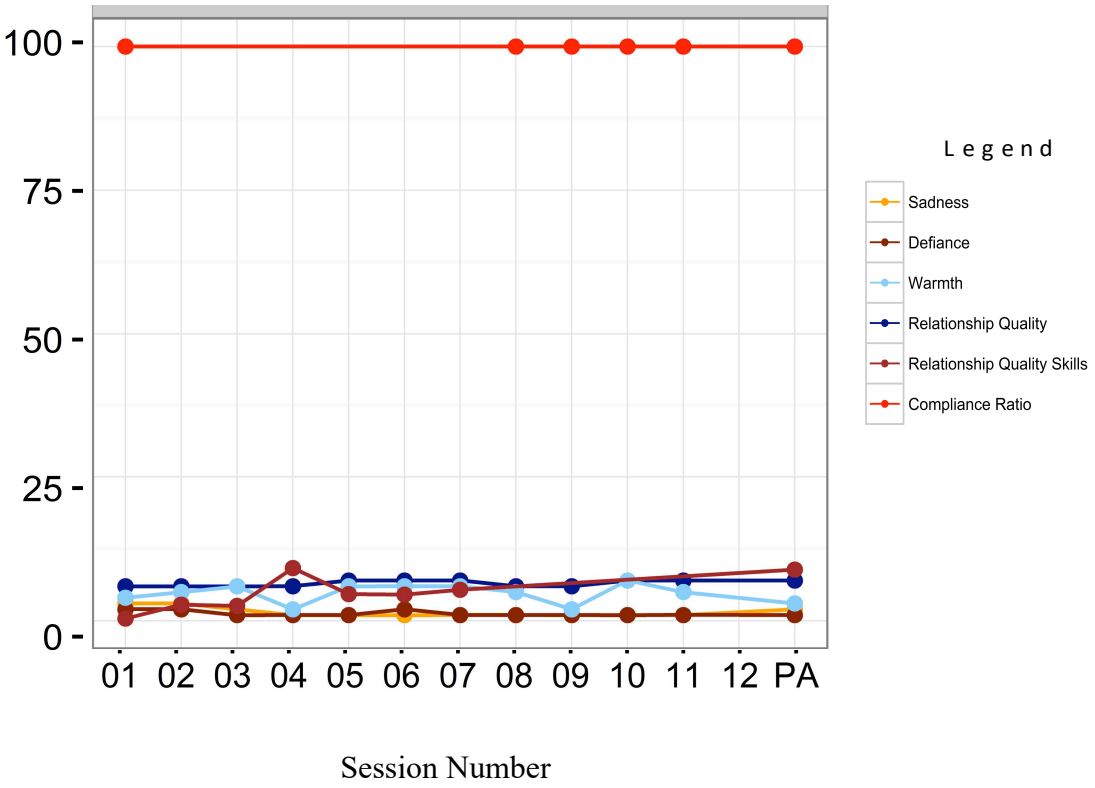


Figure 13. Caregiver 13 plots of study variables.





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