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An Exploratory Study of Patterns of Family Risk, Engagement, and Program Completion in a Home Visiting Intervention

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Home Visiting Intervention

University of Connecticut [2014]

Home visiting programs are a common early intervention for families with young children who are experiencing multiple stressors in the developmental environment. Evaluations of the effectiveness of these programs produce mixed findings; high dropout rates, influenced by both family and program characteristics, are a major challenge for home visiting programs. To understand better for whom these programs are effective under what circumstances, evaluations need to capture the complexity of program experience. This study explored the relation between patterns of risk at intake, engagement quality, and program completion, using a case survey design. Patterns across three domains of family stress were examined: parent-child relationship stress, parent depression, and environmental stress. In addition, three features of engagement were coded: client disposition, insight, connecting to services. The sample consisted of 152 mostly multiple need families in Child First. Results showed that sixty percent of the sample did not complete the program. The patterns of stressors at intake reflecting low levels of stress in all three domains and elevated levels of stress in all three domains occurred more often than expected by chance, suggesting a significant interaction between the three domains within individuals. The most frequently observed pattern was that of high reported environmental stress only. Over half of those who reported elevated environmental stress and high stress in all three domains did not complete the program, and for most of these clients their case notes in their initial visits did not include a discussion of connecting to other community services. In addition, parents who were noted to demonstrate a disposition reflecting greater resistance towards the home visitor during their final visits were more likely to not complete the program than those

who were cooperative; a significant effect of site was also demonstrated. The results of this exploratory study provide initial insight around the influence of psychosocial stress and environmental stress at intake on client's program experience and the utility of measuring the quality of engagement in services. Directions for future studies that would further disentangle the complexity of program experience and inform clinical practice are discussed.

An Exploratory Study of Patterns of Family Risk, Engagement, and Program Completion in a
Home Visiting Intervention

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Doctor of Philosophy Dissertation

An Exploratory Study of Patterns of Family Risk, Engagement, and Program Completion in a
Home Visiting Intervention

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An Exploratory Study of Patterns of Family Risk, Engagement, and Program Completion in a Home Visiting Intervention

Home visiting programs are a fixture in the current spectrum of early interventions available to parents and are increasingly the focus of state and federal legislation and funding initiatives (Daro, Hart, Boller, & Bradley, 2012; Matone et al., 2013). These intervention programs provide in-home, individual family support through the context of the home visitor-client relationship in order to minimize the effect of risk factors and promote resiliency factors present in the developmental environment of children. Although the specific aims of home visiting programs vary, randomized control trials supported the effectiveness of several evidence-based models, such as Early Head Start (EHS), Healthy Families America, and Nurse-Family Partnership, for improving various parent and child outcomes (Azzi-Lessing, 2011; Gomby, 2007; Mattox, Hunter, Kilburn, & Wiseman, 2013).

The effectiveness of home visiting programs has been questioned, however. Following successful initial research demonstrations, mixed findings emerged from larger “scaled-up” and non-randomized studies (Daro et al., 2012; Matone et al., 2013). This discrepancy across studies is partially due to the reality of implementation in non-controlled settings; in other words, replications lack fidelity such that implementation varies across community context and implementation settings (Korfmacher, Kitzman, & Olds, 1998; Matone et al., 2013). The context for and interpersonal aspects of implementation can play a large role in the demonstrated program impacts; further, parent experiences, including their services utilization and emotional investment in the program, can influence outcomes (Daro et al., 2012). Consequently, client influences and outcomes need to be examined not only within initial demonstrations and highly

controlled studies, but also within the contexts in which dropout and client improvement are evidenced (Azzi-Lessing, 2011; Korfmacher et al., 2008).

In order to better understand outcomes, programs have begun to look inside “the black box” at the processes that occur during program involvement that may influence outcomes (Korfmacher, Green, Spellman, & Thornburg, 2007). A major limitation of home visiting programs is their high non-completion or dropout rates, regardless of the number of prescribed visits that are suggested (Daro et al., 2012; Gomby, 2007). Gomby (2007) argues that home visiting implementers need to understand which contextual features, specifically the characteristics and circumstances of both the individual families and the implementation of the program, increase the likelihood that families will undergo services with limited fidelity, experience fewer quality interactions during program enrollment, and demonstrate poorer engagement and outcomes as a result. This knowledge can influence the way home visitors approach and support families (Daro et al., 2012).

These contextual influences are captured well in person-centered approaches that examine individual client experiences and document how characteristics of individuals and programs transact to influence experiences of families and the outcomes of those experiences (Bergman, 1998; Magnusson, 1998). Person-centered approaches acknowledge that each individual’s development is a manifestation of patterns of factors which are a combination of both individual factors (e.g., psychological, biological, behavioral) and environmental factors (e.g., physical, social, cultural; Magnusson, 1998). An assumption underlying this approach then is that variables do not uniformly influence individuals in the same way. Instead, they interact with other variables present in the individual and environment, and it is those unique interactions

that influence the individual's development (Bergman, 1998). In the case of home visiting programs, evaluations need to capture the complexity of an individual's program experience.

The current study uses a person-centered approach to explore factors that influence the likelihood of completing one home visiting program, called Child and Family Interagency Resource, Support, and Training (Child First). Child First is an intensive, home-based early intervention program for families with children younger than six in Connecticut. Serving hard-to-access families who are facing multiple stressors, the program is embedded in a system of care and provides: 1) case management to connect families with a continuum of services and integrate and streamline service delivery; and 2) intensive, dyadic psychotherapy during home-visits. These program goals are achieved through a team-based model. Families are served by a bachelor's level care coordinator and a master's level mental health clinician, both of whom work with the family for the entirety of their time in the program.

The program model is based on an ecological approach, in which the multiple psychological and physical stressors in the child and family's environment are addressed in order to improve the caregiver's functioning and the child's healthy development. Moreover, engagement of family members in psycho-therapeutic treatment and wrap-around services is thought to be the intervening component between enrolling in the program and improved outcomes in parental functioning and child development (Lowell, Carter, Godoy, Paulicin, & Briggs-Gowan., 2011). Families typically remain in the program for six to twelve months, and the number of visits experienced during this time is variable, based on the need of the family. An ideal exit from Child First is when the team and parent(s) agree that the family has made sufficient progress and is ready to exit the program and the family transitions out.

A randomized control trial (RCT) of Child First (Lowell et al., 2011) was conducted with 157 clients from one city in Connecticut. The results showed improved outcomes for both parents and children age birth through 36 months, including decreased levels of depression and mental health problems in parents, improved child behavior and language skills, and decreased child welfare involvement. Furthermore, after 12-months 91.2% of all service needs reported by clients were addressed by the program. A second study, conducted in the same city in Connecticut by Crusto and colleagues (2008), evaluated outcomes for a subsample (N = 82) of Child First families whose children had been exposed to family violence. In addition to examining violence and trauma-related symptomology, they examined service utilization (i.e., length of stay and hours of service provision) and how these factors influenced trauma and violence-related outcomes. Results showed that those who participated in Child First experienced a decrease in exposures to traumatic events, in the child's intrusive and avoidant behaviors, and in parenting stress from intake to discharge. Those who remained in the program longer and who received a greater number of service hours showed greater decreases in post-traumatic related symptoms. In this study, 84% of recommended services were received by families within 90 days of the recommendation.

Since the RCT at the first site of Child First, the program has expanded and has been named an "evidence-based home visiting model" under the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) initiative created by the U.S. Department of Health and Human Services Health Resources and Service Administration (HRSA) and Administration on Children and Families (ACF). Although the program has demonstrated positive outcomes, to date there has been no extensive study of families who did not complete the Child First program. In particular, this study is an exploratory study of the characteristics of clients as they enter the

program, their engagement in the program, and how both of these relate to whether or not a family completes the program.

Research on Dropout from Home Visiting Programs

When programs have a prescribed number of visits, non-completion of the program is often described as dropping out. As previously mentioned, one of the challenges to the growing evidence base of effective home visiting programs and other child and family prevention and intervention programs is the high rate of dropout in these programs (Gomby, 2007). Dropout rates in child and family mental health programs have been reported to be between 40 and 60% (Ingoldsby, 2010; Kazdin, Holland, & Crowley, 1997; Roggman, Cook, Peterson, & Raikes, 2008). Presumably, a large portion of those who dropout of the program is in need of services but choose not to or are unable to remain in the program. For these families, the opportunity for services that address the needs of the family to improve the developmental environment is lost (Staudt, 2007). Understanding the reasons for and the timing of dropout can provide informative feedback for programs about those who are more likely to leave the program abruptly or early in order to better meet the needs of these families (Roggman et al., 2008). Studying those who drop out of programs is a challenge, as program staff and evaluators often do not have access to clients once they are gone. Therefore, few studies have examined the attrition group in depth to understand the circumstances surrounding program exit.

The research that is available suggests that multiple influences accumulate to increase the likelihood of dropping out (Ingoldsby, 2010). Roggman et al. (2008) examined reasons for dropping out among an EHS sample and found that, among the 40% who dropped out early, 50% asked to leave early and another 41% were involuntarily terminated from the program due to poor attendance. When parents were asked why they left the program, 65% relayed that they

lacked the time to participate and 12% stated that the program did not meet their needs. Kazdin and colleagues (1997) conceptualize these reasons for leaving treatment as barriers to treatment and suggest that the likelihood of drop out is influenced by two important domains: (1) individual and family qualities and characteristics and (2) qualities and characteristics of the family's program experience. Examples of family characteristics include housing issues, domestic violence, and parental mental health issues, and program experience variables include a mismatch between parent expectations and program goals, engagement with the service program, and an unfeasible time commitment (Ingoldsby, 2010; Kazdin et al., 1997). To build on this literature, the current study examines the influence of family characteristics, namely patterns of risk at program intake, and program experience, in terms of engagement, on the likelihood of completing treatment in a sample of families from Child First. Drop out will be conceptualized as non-completion for this study as non-completion is a more positive term and the program Child First not have a prescribed number of visits.

The Influence of Multiple Risk Factors

Interventions such as home visiting programs are typically designed for families who are experiencing multiple environmental and psychosocial adverse stressors that are placing the family at-risk for negative long-term outcomes. Research consistently demonstrates that children experiencing multiple negative adverse conditions over time in their developmental environment have the poorest outcomes (Evans, Li, & Whipple, 2013; Sameroff, 1998). Therefore, home visiting programs work with families to address the stressors and barriers to stability present in the family environment to increase the self-sufficiency of the family and ideally improve the developmental trajectory of the children. There are a variety of potential individual and environmental factors that have been documented and explored as sources of risk in the

literature, including maternal age, marital status, ethnicity, education level, maternal depression, mental health issues, substance abuse, and domestic violence, and housing difficulties. All families do not experience the same set of adverse conditions, and each factor individually may not cause significant distress to the family. Rather, it is the interaction of multiple stressors that puts the family at risk and each family has their own constellation of stressors (Sameroff, 1998).

Because home visiting programs, including Child First, are targeting families experiencing multiple stressors, the family's constellation of stressors not only creates the need for services, but it also influences the way the family interacts with, engages in, and ultimately leaves the program (Azzi-Lessing, 2011; McGuigan, Katzev, & Pratt, 2003). That is, a family's individual experience with a program is in part influenced by the family's own history, experiences, and characteristics prior to entering the program (Littell, Alexander, & Reynolds, 2001). These factors that are contributing to the stress the family is experiencing may also make it difficult for parents to focus on the children and may impair their ability to participate and engage in a home visiting program (Korfmacher et al., 1998; Platt, 2012).

In sum, those at highest risk, or those experiencing increased stress from a variety of sources, tend to be those that have the greatest need for services, but they are also the least likely to receive or accept them (Ingoldsby, 2010; Jack, DiCenso, & Lohfield, 2002). Indeed, Kazdin et al. (1997) found that those deemed to be at higher risk in a sample of patients participating in a child mental health treatment experienced more perceived barriers to treatment. Examining patterns of risk among families served by a home visiting program can provide insight about the typology of clients who are more or less likely to complete program services, which can then feed back into service delivery (Azzi-Lessing, 2011). If home visitors are aware that particular stressors are associated with a higher likelihood of poor engagement in or dropping out of the

program, they could alter their approach towards interactions with families who demonstrate those patterns (Robinson et al., 2002). This study investigated whether families demonstrating particular patterns of stressors experience greater difficulty engaging in Child First and whether particular risk patterns are related to program exit.

Parent Engagement

Within the family services field there has been a wide range of conceptualizations for engagement. Similar to recent research in the child welfare field (e.g., Altman, 2008; Farrell, Luján, Britner, Randall, & Goodrich, 2012; Littell et al., 2001; Yatchmenoff, 2005) and in Early Head Start (Korfmacher et al., 2007; Korfmacher et al., 2008), engagement in the current study was defined broadly as the degree to which clients are actively involved in the helping process, including affective, behavioral, and cognitive indicators (King, Currie, & Peterson, 2014; Platt, 2012). Under this definition, engagement is considered a characteristic residing in the parent, rather than a description of the relationship between the parent and home visitor. In other words, home visitors use the staff-parent relationship to evoke and promote parent engagement, or active involvement, in services (Raikes et al., 2006).

Often, evaluations measure engagement through quantity indicators of program participation, such as attendance or number of completed home visits, because they are readily measurable and necessary pre-requisites for program interactions to occur (e.g., Axford, Lehtonen, Kaoukji, Tobin, & Berry, 2012; McGuigan et al., 2003). However, when used as sole indicators of engagement, dosage or quantity indicators have been found to be poor predictors of parent outcomes and do not capture the quality of the parent's involvement during program interactions (Korfmacher et al., 2008; Nix, Bierman, & McMahon, 2009; Sweet & Appelbaum, 2005). For example, in an EHS sample, Raikes et al. (2006) found that quantity indicators of

engagement were no longer significant predictors of outcomes once quality ratings of engagement and demographic characteristics were added into the model.

In recent years, engagement has been conceptualized as a multi-dimensional construct made up of both quantity components (e.g., number of visits) and quality components, such as the parent's behavior during visits, that reflect the interpersonal aspects of program participation (Korfmacher et al., 2008; Littell et al., 2001; McCurdy & Daro, 2001). One challenge to measuring engagement in programs has been to capture the distinctive but interrelated components of engagement. Whereas the quantity indicators of engagement are fairly well articulated in the literature, the quality of engagement has been measured less often in the literature. However, there are a number of theoretical models of engagement and qualitative studies that can inform the measurement of quality. In other words, past studies point to some potential indicators of the quality of parent's investment in the program, i.e., discrete behaviors and verbalizations that reflect whether the parent is engaged in the home visit.

Numerous studies highlight parent disposition, or affective attitude and activity level, during home visits. Littell et al. (2001) present a model where participation can vary based on activity level, ranging from passive to active, and valence, ranging from negative to positive. The intersection of these two qualities creates four categories of parents' behaviors, ranging from hostile and withdrawn to cooperative and compliant. Similarly, King et al. (2014) present a model of engagement that includes affective, cognitive, and behavioral components of engagement. They identify three change processes, corresponding to each component, that demonstrate the client is engaged. The affective and cognitive components of engagement are demonstrated through receptiveness and willingness, two adjectives that suggest the parent is open and has a desire to participate. Finally, McCurdy and Daro (2001) and Platt (2012) identify

attitude towards services as a key client factor that influences if an individual enrolls and engages in a home visiting program. Platt (2012) further identifies the parent's use of the home visitor's contributions and task completion as behavioral indicators of engagement.

Jack, DiCenso, and Lohfield (2002, 2005) conducted qualitative studies in which they interviewed parents and home visitors in the Healthy Babies, Healthy Children program. Home visitors noted that distractions, withdrawal, passivity, and avoidance on the part of the parent detracted from the ability of the home visitor and parent to build a relationship and relayed that the parent did not want to enter into an interaction with the home visitor (Jack et al., 2002). Interviews with the parents revealed that they often felt a degree of fear when entering the home visiting program and when they could not overcome that initial fear they were hesitant and resistant to participate (Jack et al., 2005). In the current study, *client disposition*, therefore, captures the continuum of behaviors that reflect the parent's attitudes towards and willingness to participate in the visit and in interactions with the home visitor, ranging from being withdrawn and hostile to collaborative and actively involved.

Some research also supports the importance of parent insightfulness, or moments of growth and reflection during visits, as well as moments when parents can practice or demonstrate their parenting skills. Platt (2012) notes the importance of parent's ability to communicate with the home visitor and share ideas, including recognition of and openness about their problems, as well as complete tasks asked of them. Put another way, Littell (2001) discusses the difference between parent's complying with the home visitor and collaborating in the helping process. Collaboration refers to a partnership with the home visitor where the parent provides some insight into what they need as a family and are active in working with the home visitor. Altman (2008) found through qualitative interviews that child welfare workers noted it was easier to

work with parents who had some capacity for insight because the work required parents to be aware of and understand their situations accurately. Furthermore, Jack et al. (2005) found that parents felt they could begin to open up and speak more candidly with the home visitor once they trusted the home visitor, showing greater engagement in the program. The home visitors also noted that when they could model behaviors or teach parents new skills it helped engage them in the program (Jack et al., 2002). Moments when parents acknowledge their strengths and weaknesses, gain insight into their family's challenges, and practice healthy interactions and parenting skills during a visit may reflect critical moments of engagement in services. As such, two variables, *expressing insight* and *practicing a skill*, are also used as indicators of the quality of engagement in the current study.

Finally, one of the major goals of home visiting programs is to strengthen the self-sufficiency of the parents and families so that they can maintain and build on their healthy functioning after working with the program. King et al. (2014) identified self-efficacy as the change process reflecting behavioral involvement of the client. Moreover, Platt (2012) identified taking initiative as one of the key indicators of engagement in a program and Altman (2008) refers to the importance of active work towards change.

McCurdy and Daro (2001) also identified the provision of concrete goods to families as one factor that predicts retention in a home visiting program. Home visitors interviewed by Jack and colleagues (2002) also noted the importance of providing the family with practical assistance in the first few visits as a major way to help the family and build trust. Home visitors may look for signs of behavior changes reflecting greater self-efficacy as a basic indicator of how invested a parent is in the program and at the same time may work to quickly connect families to services so that the barriers they are facing may be addressed from the very beginning of program

involvement, allowing the social-emotional work to continue over time. Therefore, *connecting with services* was the fourth and final indicator of engagement in the current study. This indicator captures the degree to which connecting with services is discussed during visits as well as the client's self-sufficiency and ability to connect with the services to which they are referred.

In addition to having both quantity and quality components, engagement is thought to be dynamic, e.g., a process that changes over the course of program involvement as the relationship between the home visitor and parents grows and wanes and as the parental investment changes (Altman, 2008; McCurdy & Daro, 2001). Capturing levels of engagement in each visit can provide home visitors opportunities to reflect on areas of growth for the parent as well as new strategies to sustain or improve engagement at different points throughout intervention delivery. However, most studies that have measured engagement used surveys and multiple item scales to capture it at one point in time (Alpert & Britner, 2009; Altman, 2008; Yatchmenoff, 2005). No studies to date have created or utilized a visit-by-visit measure of engagement that incorporates indicators of the quality of engagement. This study will build on previous work and models of engagement to capture discrete indicators of the quality of engagement over time. Four indicators of the quality of engagement will be examined: client disposition, client insight, practicing a skill, and connecting to services. Furthermore, they will be explored over the course of program involvement, focusing particularly on the beginning and end of program involvement.

Risk, Engagement, and Program Dropout

Very few studies have looked at the relation between these three program factors, risk, engagement, and dropout, in the same study; more commonly, the relation between two of the three constructs is examined. First, the level of risk a parent is facing has been connected to a

higher likelihood of dropping out of the program. Roggman and colleagues (2008) looked at five risk factors (teenage mother, single mother, lower education, welfare recipient, and unemployment) in a sample of EHS mothers and found that as the number of risk factors increased the more likely the mother was to drop out of the program early, in line with the cumulative risk perspective. Kazdin and colleagues (1997) also found that half of their high risk group (those who demonstrated six or more risk factors) dropped out of the mental health intervention; moreover, among the high risk cases, perceptions of fewer barriers to treatment attenuated risk of dropping out, suggesting that the parent's perceptions of barriers to treatment can add to or diminish the effect of family risk factors.

Initial risk level has also been connected to poorer engagement. For example, Wagner, Spiker, Linn, Gerlach-Downie, and Hernandez (2003) found that older, more educated, higher income parents (i.e., those at lower risk) received higher ratings of engagement in Parents as Teachers. Robinson and colleagues (2002) found that parents who attended visits but were rated as below average on involvement in visits showed a lower sense of mastery, displayed a more difficult attitude toward relationships, and reported more stressful life events. McGuigan and colleagues (2003) found that mothers in the Oregon Healthy Start program who experienced social isolation or lived in a county with poor community health or were less likely to actively engage in home visits, defined as participating in the program for more than 90 days. Altman (2008) looked at engagement at three time points and found that families who were rated as more risky at baseline showed lower working alliance scores at the start of their time in the program. Risk was a global, single item indicator, but these findings suggest that risk factors may in fact influence engagement differently over time.

Finally, some research suggests that parents who drop out of intervention programs early show less engagement while in the program (Ingoldsby, 2010). Jack et al. (2005) found that parents noted that when they could not overcome their fear or felt they could not trust the home visitor, signs of a lack of engagement, they were more likely to drop out of the program. Roggman et al. (2008) found that families who dropped out of EHS had lower ratings of engagement, and conversely each point increase in overall parent engagement ratings decreased the probability of dropping out by 51%.

Current Study

The current study is an exploratory examination of the relationship between patterns of risk at intake, initial program engagement, and program exit using a person-centered approach in a sample of parents served by a home visiting program designed for families facing multiple challenges. The primary aims of this study are:

1. To describe both the length of stay and types of exit from the Child First program
2. To identify if there are common patterns of risk in families at program intake
3. To identify and describe ratings of four engagement qualities (disposition, insight, practicing skills, and connecting with services) found in quantitative coding of case notes at two time points: an initial episode and final episode.
 - a. To describe the proportion of visits in which insight was noted per client across the entire length of program involvement and to isolate and describe instances where clients were unable to provide insight when prompted.
4. To use the patterns of risk at intake and client engagement as a predictor of program exit.
 - a. To use risk patterns at intake to predict program exit
 - b. To use engagement qualities in the Initial and Final episodes to predict program exit

- c. To examine how initial risk patterns relate to initial engagement qualities
- d. To simultaneously use patterns of risk patterns at intake and engagement qualities to predict program exit

Method

This study is a secondary analysis using data from three Child First sites in Connecticut. The original program site was selected because it has been operating the longest. Two additional sites chosen were smaller but well-established and stable in order to obtain the most reliable and complete data with which to evaluate client participation in Child First. Data sources included case notes from closed cases and assessments given to families upon entry into the program. The care coordinator's and clinician's case notes were coded for indicators of engagement throughout a family's participation in the Child First program as well as for program exit. Baseline assessments of risk, which are given to all clients as part of their program protocol, were also obtained from the program for the same set of clients.

Procedures

The three sites were asked to provide access to all closed case files that were opened and closed between the window of August 2010 and August 2012. This timeframe was selected as it was approximately when the two smaller sites began serving clients; thus, it provided an equal time frame across all three sites. The original program site (Site 1) had a significantly larger sample of closed cases from this time period than the other two sites because it had been running longer and has a larger case capacity. Sites 2 and 3 had roughly 50 closed cases from this time period. Therefore, a random sample of 65 of the 200 closed cases was chosen at Site 1 to create balance among the sample sizes from the different sites. Chi-square and t-test analyses showed the random sample was similar to the unselected cases in terms of proportions of male and female children, ethnicity of the child, the child's age at program entry, and level of child welfare involvement.

Obtaining baseline data. The program developed a toolkit of measures that are used to assess families when they begin the program and when they exit the program. Some of the measures are intended to be completed for all families and other measures are provided for instances where there is concern in a particular area (e.g., the Ages and Stages Questionnaire for children who may be showing developmental delays). The measures chosen for this analysis were those that addressed key areas of risk based on the literature and were completed on a more routine basis. Using a screening ID created by the program, baseline data for this sample of families was pulled from a database shared by all sites.

Case review. In order to code for specific qualities of engagement in Child First, a coding scheme was developed for this study to capture qualities of engagement demonstrated by the parent in each visit. A draft of the coding scheme was first developed based on the theoretical models of engagement provided in the literature (e.g., Altman, 2008, Jack et al., 2002, King et al., 2014, Littel et al., 2001) and included four engagement qualities – client disposition, client insight, practicing new skills, and progress towards goals. These qualities are not mutually exclusive or exhaustive. Rather they are common behaviors witnessed by and commented on by the home visitors that may vary across families and across time and are literature-grounded domains that reflect the affective, behavioral, and cognitive pieces of engagement.

In order to confirm that the coding scheme met the specific needs of Child First and aligned with the home visitors notes, the author conducted focus groups with the staff at the three program sites. The focus groups began with a discussion of parent engagement and a request that the team discuss examples of parental engagement and non-engagement. Following this discussion, the working definition of engagement used in this study was presented as well as the draft coding scheme, allowing staff to provide feedback based on their knowledge of the notes

they complete after visits. This process fleshed out the levels of the four qualities so that specific behaviors and parent responses could be developed to describe each level of each quality.

‘Progress towards goals’ was changed to ‘connecting to services’ as it this could be captured in discrete units more easily.

Because clinicians and case managers did not create their case notes explicitly with these qualities in mind, if the quality was not mentioned in the note (meaning the quality could not be coded), it would be inappropriate to assume that the client failed to demonstrate the quality. Therefore, it was determined that the missing data code would be included in the coding scheme to signify that the quality was unable to be rated for that visit.

Coding. The coding scheme developed for this study was used to capture qualities of parent engagement on a visit-by-visit basis (See Appendix A for complete coding scheme). Once permissions were obtained to view the case files, six case files were coded to pilot the coding scheme. Each visit, including both the clinician’s and care coordinator’s note when available, within the case file was coded for *client disposition*, *client skills*, *practicing a skill*, and *the connecting with services*; adjustments were made as necessary to the coding scheme. The discharge summary was also coded to learn about how and when the family *exited the program*.

Three research assistants were trained on the coding scheme, and 20 case files were double coded during initial training in order to establish inter-rater reliability. An additional 14 cases were double coded throughout the data collection to ensure on-going reliability. Cohen’s Kappa coefficient was calculated for each quality across all double-coded cases. The Kappa coefficient for client disposition was 0.87, client insight was 0.75, practicing skills was 0.32, and connecting with services was 0.69. The Kappa for practicing skills was very low because it was

not coded very often and there was not enough variability in the ratings. Practicing skills was therefore not used in further analyses in this study.

Client disposition. *Client disposition* captures the clients' affective and behavioral attitude towards the home visitor during the visit and their willingness to work with the home visitor. It was rated on a 5 point scale ranging from 0 (Not Involved) to 4 (Actively involved), each of which were further defined by a range of characteristics that describe that level. Not involved signifies when the parent refuses to participate in the visit and/or is hostile towards the home visitor, and, on the other end of the continuum, clients who are actively involved are those who collaborate with the home visitor and participate fully in the visit.

Client insight. *Client insight* captures moments when the client was noted to offer some reflective understanding about his or her own behavior or past experiences or the child's behavior, either spontaneously or when prompted by the team. This is a cognitive component of engagement. It was rated on a 3-point scale from 0 (No insight) to 2 (Significant insight). Client Insight was coded as a 0 if the client was prompted to provide insight but was unable to in that visit, a 1 if the client provided some insight either spontaneously or when prompted, and a 2 if the client had a significant insight (an "aha" moment) as noted by the clinician.

Practicing a skill. This quality was developed to capture instances when parents were able to actively demonstrate their engagement by *practicing a skill*, such as disciplining the child or writing a resume, during a visit. It was dichotomously coded as yes, an instance of practicing occurred during the visit, or no, the parent was unable to practice when guided.

Connecting with services. *Connecting with services* captures the care coordination component of this program. Additional service providers that are needed are identified and the program works with the family to connect them with those services. This quality measures the

degree to which the parent was independently able to connect to the services to which they were referred. It was measured on a 0 (did not follow up with a referral or service) to 3 (connected to a service independently) scale. A 1 on this scale represented when the parent allowed the team to follow through on the referral for them and a 2 represented situations when the parent followed through with the referral while the team was with them.

Participants

In the final sample, a total of 152 case files were coded. Sixty-one cases were from Site 1, 50 cases were from Site 2, and 41 cases were from Site 3. The included cases incorporated families whose target child was between the ages of birth and six years because the program is designed for children in this age range. Families were excluded from the final sample for one of two reasons. In six cases, a family went through intake but never actually attended a home visit, i.e. case was opened but then closed because a home visit could not be conducted. An additional six cases were lost from the sample at Site 3 because the case files could not be accessed by the research team.

Measures

Demographic variables. Several parent and child demographic variables were coded from the case files. *Parent age at intake* was coded dichotomously to capture whether the parent was a teen (1) or not (0) when he or she was referred to the program. In order to account for the developmental differences between infants/toddlers and preschoolers, *child age* was a dichotomous variable and was coded as (0) when the child was 36 months or younger at the start of the program and (1) when the child was 37 to 72 months (age 3 through 6). *Child gender* and *child ethnicity* was also recorded. Finally, *DCF involvement* was coded trichotomously [0=

never involved, 1 = past involvement, 2 = current involvement] to indicate whether a family ever had an open case with DCF.

Indicators of risk. Three baseline assessments were selected as indicators of risk; all three variables were coded dichotomously to signify if the client was high, above the clinical cutoff, or low, below the clinical cutoff, on each risk domain. Those who were coded as low meant that the particular risk domain was not a major concern for that parent.

Parent-child relationship stress. The Parent-child Dysfunctional Interaction (PCDI) subscale of the Parenting Stress Index – Short Form (Abidin, 1990), the shortened version of the Parenting Stress Index, was used as an indicator of *parent-child relationship stress* (PCRS). The PCDI subscale captures the degree to which the parent is satisfied or dissatisfied with his or her interactions with the child and the degree to which the child is not meeting the parent's expectations. The subscale, completed by the parent, consists of 12 statements; the parent rates the degree to which they agree with each statement on a 5-point scale. Scores ranged from 12 to 60; according to scale developers, a score above the 90th percentile (above a score of 26 on the PCDI subscale) indicates a clinically significant level of stress in this area. Validity and reliability for the overall measure, as well as its subscales, is well documented (Deater-Decker & Scarr, 1996; Haskett, Ahern, Ward, & Allaire, 2006).

Parent depression. The **Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977)** is one of the most common screening tests for depression and is used as an indicator of *parent depression* (PD) in this study. It is a 20-item scale in which items are answered on a 4-point scale from rarely or none of the time (0) to most or all of the time (3). The self-report measure captures depressive feelings and behaviors during the past week. A sum of items is calculated, for a range of possible scores of 0-60, with higher scores indicates more

depressive symptoms (Radloff, 1977). Although the tool was not designed for clinical diagnosis, a score of 16 or higher indicates levels of symptomatology that may be clinically relevant (i.e., at-risk for clinical depression; Radloff, 1977). The CES–D has shown acceptable reliability and validity, with high internal consistency ($\alpha = .85$ to $.90$) as well as strong concurrent and construct validity and sensitivity to the levels of depressive symptoms (Radloff, 1977).

Environmental stressors. The **Parent Questionnaire (PQ)** was used to capture stressors in the home and community environment that a parent is facing. The PQ is a 25-item, parent-report screener developed by Child First; there is no published psychometric information on the PQ. Risk is assessed in 12 domains, including domestic violence, substance use, homelessness, incarceration, depression, social isolation, single and teen parenthood, education, and employment. Each domain includes 1 to 3 yes/no questions. An overall score is calculated by adding up all the “positive” domains (i.e., risk factors that are present for the client), resulting in scores that range from 0 to 12. For screening purposes, a score of 3 or more is considered to be a score indicative of environmental risk. For this study, when a parent reported 3 or more positive domains they were coded as high on *environmental stress (ES)*.

Parent engagement. In total, 2,521 visits were coded across the 152 parents. As noted in the description of Procedures, the engagement qualities could not be coded for visits where that quality was not discussed in the team’s notes for that visit. Therefore, a rating was not available for every visit and averaging across visits would fail to reflect potentially important variability over time. **Table 1** shows the number of visits for which each quality or feature could be coded. As noted earlier, practicing skills was not mentioned often and was only coded in 7.3% of the visits (56.3% of the parents had no coded occurrences of practicing skills) and was not used in further analyses.

Table 1.

Number of Valid Codes for Each Feature of Engagement (n = 2,521)

Quality	Valid	% Valid
Client Disposition	2467	97.9
Client Insight	688	27.3
Practicing Skills	185	7.3
Connecting to Services	856	34.0

The engagement qualities were scaled to dichotomous or trichotomous variables. In order to explore engagement at two different time points, the engagement qualities were scaled for two different time periods or episodes: initial engagement and final engagement. The *Initial* episode was defined as the first six weeks after the client’s first visit. The number of visits in the initial episode ranged from 1 to 12 visits, with the most common number of visits being 3 visits ($n = 27$). The *Final* episode was defined as the final two to six visits before program exit, excluding visits that occurred in the initial episode. Visits instead of weeks were used for the final episode because visits are expected to be more spaced out over time as the family’s need decreases. Six visits for the final episode was selected to provide a similar time frame as the initial episode. Working backward from the final visit, the last six visits were selected. However, in instances where the client did not have six visits after the initial episode, less than six visits were used to create scores for this episode. For example, if the client experienced eight visits while in the program and four of them occurred in the initial episode, then the final four visits were used for the final episode. Clients who had zero or one visit after the initial episode were not included because not enough data were available to analyze a final episode. Ultimately, a total of 109 clients were included in this analysis. Because insight was noted less commonly, it additionally was analyzed across all visits within an individual’s program participation.

Initial and final client disposition. Overall, for client disposition, clients were most often coded as cooperative and compliant. Since showing resistance or negativity was less common, but critical moments for understanding engagement, disposition was coded based on the number of occurrences when resistance was demonstrated. Specifically, for both the initial and final time periods, client disposition was coded as 1 if the client showed resistance or negativity in 20% or more of the initial visits and 2 when resistance was shown in less than 20% of initial visits.

Initial and final client insight. Across all visits, only eight occurrences of significant insight were coded. Therefore, these eight codes were collapsed with the instances where some insight was noted. For both the initial and final time periods, clients were coded as a 2 if they provided an insight in at least one visit and a 1 if no instances of insight were noted in any of the visits.

Proportion of moments of insight. For each client, the number of instances where an insight was offered by the parent and noted by the home visitor was divided by the number of visits to create a proportion of visits for which insight was noted.

Initial connecting to services. For 73 clients, connecting to services was not discussed at all in the initial six weeks. Due to the low variability in the initial weeks, *initial connecting to services* was coded as a 1 when it was not mentioned at all in the initial six weeks and a 2 if it was coded at least once in the first six weeks.

Final connecting to services. In the final time period, connecting to services was not mentioned in any visits for fewer clients. Therefore, summarizing connecting to services was accomplished differently for the final time block so as to capture greater variability. Those who demonstrated self-sufficiency in connecting to services in at least 20% of their final visits were coded as a 3, those where connecting to services was not mentioned at all were coded as a 1, and

the remainder were coded as a 2, as connecting with services was discussed but it was mostly completed by the program (i.e., low self-sufficiency in connecting to services).

Type of program exit. The main outcome of interest in this study is when and how clients leave the program. The discharge summary was used to code the *type of program exit*:

Non-responders. The non-responders were those who stopped responding to the team's efforts to contact them and schedule a visit. These clients did not communicate to the program a desire to end services and this lack of communication relayed their choice to not continue with services and complete the program.

Logistic and autonomous early leavers. The logistic and autonomous early leavers were those who left the program earlier than the program staff intended, but they communicated a desire to end services due to logistical barriers or because they felt services were no longer needed, despite the home visitors still recognizing a need for services. Some of these families moved away and therefore could not complete the program. Others cited changes in schedules and new work or school schedules as reasons for a lack of time to meet with the home visitors consistently. Still others felt their needs were not met, or after a call to child welfare services had to be made by the team, the parent felt the family no longer wanted to be part of the program.

Treatment completer. Treatment completers were those who made sufficient progress in the program, which was mutually decided on by the home visitors and parent, and the family was transitioned out of the program. This outcome does not imply that progress was necessarily significant or stability was reached. It simply designates that the parents and staff felt that progress had been made and Child First services were no longer needed.

Data Analysis

Aim 1. Descriptive analyses for the average length of stay, average number of visits, and type of program exit were conducted. Site differences in these program involvement variables were tested using chi-square analyses.

Aim 2. Preliminary descriptive analyses were conducted to explore the number of clients reporting scores above the cut point on each risk domain individually and the strength of the relation between the risk domains. Then, configural frequency analysis (CFA), using Von Eye's (2007) CFA program, was applied to test patterns of risk at program entry among this sample of Child First clients using the three domains of risk: parent-child relationship stress, parent depression, and environmental stress. CFA is a method for analyzing all possible patterns of variables among a sample of individuals. It was originally proposed by Lienert in 1969 and has been further developed by Lienert, von Eye, and other colleagues in more recent years (Stemmler & von Eye, 2012; von Eye, Mair, & Mun, 2010). Rather than examining individual variables and how they influence an outcome, CFA examines the cross-tabulation of multiple categorical variables, testing individuals' unique interactions among variables. In other words, the cross-tabulations of the categorical variables create patterns or configurations, and CFA compares the number of individuals who demonstrate each configuration to the number that would be expected by some chance model (von Eye, Mun, & Bogat, 2008).

In the CFA analysis, the observed cell frequency is compared to the corresponding expected cell frequency under the null hypothesis that no relationships exist between the variables other than that due to chance. In other words, CFA tests whether an observed pattern occurs significantly more often or significantly less often than expected by a base model that

assumes independence among the variables. The base model, which is specified by the researcher, determines the expected cell frequencies. Model fit is calculated using the LR- χ^2 statistic, which indicates whether the base model is a good fit for the data (von Eye et al., 2010). When there are significant interactions between variables (i.e., when the model fit index is significant suggesting that there is a large discrepancy between the base model and the data), the analysis produces types and antitypes (von Eye et al., 2008). A “type” is a pattern whose observed frequency is significantly more frequent than expected by chance, and an “antitype” is a pattern whose observed frequency is significantly less frequent than expected by chance.

Significance is tested for each configuration, resulting in multiple comparisons, and a p-value is provided for each configuration. There are a number of different significance tests that can be used, with the three most common being the exact binomial test, the z-test, and Lehmacher’s exact test (von Eye, Mun, & Bogat, 2009). Lehmacher’s exact test can only be used under a product-multinomial sampling scheme (von Eye et al., 2009). The exact binomial test and the z-test can be used under any sampling scheme, and the z-test is used in this study as it has more power than the exact binomial test (von Eye et al., 2010).

Because multiple tests are being conducted at once, a procedure to protect alpha must be used (von Eye et al., 2010). There are also three methods to protecting alpha. The most well-known and restrictive way to protect alpha is with a Bonferroni correction, where alpha (.05) is divided by the number of configurations and this new alpha level is used to determine significance. However, it can be “prohibitively small when a cross-classification is large” (von Eye et al., 2008, p. 439). The other two commonly used procedures to protect alpha in CFA are the Holm procedure and the Holland-Copenhaver procedure (von Eye et al., 2008). In the Holm

(1979) procedure, a different alpha is used for every configuration. The alphas are placed in ascending order and the alpha value to use is determined by the equation

$$\alpha^*_i = \alpha / (t - i + 1)$$

where i is the current test number and t is the total number of tests. Once one configuration is rejected the process stops. The Holland-Copenhaver (1987) procedure is similar to Holm's procedure, except the formula is

$$\alpha^*_i = 1 - (1 - \alpha)^{1/(t - i + 1)}.$$

The Holland-Copenhaver procedure will be used in this study.

Aim 3. A descriptive analysis was used to summarize the engagement qualities, *client disposition*, *client insight*, and *connecting to services*, in the initial six weeks of program participation, the critical time for first engaging clients. For those who participated beyond the first six weeks, additional summary level descriptives were calculated for the final episode. The proportion of visits that clients were noted to provide insight was calculated, and the subsample of clients who had instances where they were unable to provide insight when prompted were further examined as this was a potentially meaningful moment of non-engagement (Aim 3a).

Aim 4. A predictive configural frequency analysis (P-CFA; von Eye et al., 2010) model was tested to examine the relationship between baseline risk patterns at intake and program exit (Aim 4a). P-CFA looks at the relationship between patterns of predictors and a particular outcome; it examines whether those who demonstrate a pattern of predictor variables are more or less likely to also demonstrate a particular result. In P-CFA, the base model assumes independence between the predictor variables and the criterion variable(s). Therefore, the base model accounts for all possible interactions between the predictor variables (and all possible interactions between the criterion variables if there is more than one), and if types or antitypes

are present, they signify a significant relationship between particular predictor patterns and the criterion variable.

To address Aim 4b, chi-square analysis was used to examine the relation between initial engagement and program exit as well as engagement at the end of the program and program exit. CFA was then used to examine the relation between baseline risk and initial engagement, based on earlier analyses (Aim 4c).

Finally, to connect risk, engagement, and program exit, a separate P-CFA model was tested to relate the risk and engagement configurations from analysis 4c to type of program exit. However, incorporating all the risk factors and engagement factors in one model was no longer appropriate in CFA given the current sample size, thus a logistic regression model was tested using the three risk domains and the initial and final engagement qualities as predictors of dropout.

Missing Data Management

Even among the measures of risk at intake that are intended to be completed routinely by the program, there was still missing data. The amount of missing data on the three measures used as indicators of risk (PCRS, PD, and ES) ranged from 15.8 to 32%. Looking at the patterns across variables, 93 clients had scores for all three of the indicators of risk, 27 had complete data on two of the three measures, and 14 had complete data on only one measure.

Of the remaining 18 cases, 15 of them did not have any baseline measures at intake. For 11 of these 15, they were never given a scoring base ID and no information was ever entered into the program's database on them. These 15 are not just those clients who had 0-2 visits, as the number of visits ranged from 1 to 15 visits. And they are not all from one site (eight at Site 1, four at Site 2, three at Site 3). They also cross both subgroups of child age. Therefore, there was

no apparent systematic reason that the data was missing, i.e., it does not meet the requirements for missing not at random (Enders, 2010). Multiple imputation in MPlus was implemented to address the missing data and enable the use of the complete sample. Site, child age, child gender, parent age, and DCF involvement as well as all the available baseline measures were used in the imputation. Forty imputed files were created for the baseline characteristics. Scores for each individual were calculated by averaging that person's scores across all forty data files. Then each variable was dichotomously coded using these averages.

Missing data in the engagement coding was not manipulated because of the confounding reasons that the data might be missing. In other words, missing may be because the client did not demonstrate the quality or because the client did demonstrate the quality but the home visitor did not mention the instance in his/her notes.

Results

The demographic characteristics of the sample are presented in **Table 2**. As can be seen in the table, the program is predominantly serving non-teen parents with children who are male and between the ages of three and six. The children were predominantly Hispanic, and half of the sample had some level of involvement with the child welfare system.

Table 2

Demographic characteristics of the sample

Demographic Characteristic	<i>n</i>	%
Parent age		
< 20 years old	14	9.21
≥ 20 years old	107	70.39
Child age		
≤ 36 months old	39	25.66
> 36 months old	113	74.34
Child gender		
Male	101	66.45
Female	51	33.55
Child ethnicity		
Hispanic	88	57.89
African American	34	22.37
Caucasian	10	6.58
Multiracial	10	6.58
Child welfare involvement		
No past or present involvement	76	50.00
Previous, Closed CW case	39	25.66
Present, Open CW case	37	24.34

Aim 1: Describe Length of Stay in the Program and Program Exit

The first set of analyses aimed to describe the length of stay, number of visits, and exit from the program. Overall, clients sampled for this investigation spent an average of 6.07 months in the program. **Figure 1** shows that the distribution for length of stay in the program ranged from less than one month to 30 months with about 13% spending less than a month in the program. The average number of visits in this sample was 16.59 visits, with a minimum of one

and a maximum of 67 visits (**Figure 2**). Twenty-six percent of clients experienced five or fewer visits in this sample. To create a more equal comparison across clients, the number of visits was divided by the number of months in the program to create the proportion of visits per month. The average proportion of visits was 2.81 visits per month. The largest proportion was 10 visits per month, and the modal proportions were 2 visits per month (20 clients) and 3 visits per month (19 clients). In other words, clients were typically meeting with home visitors approximately every other week.

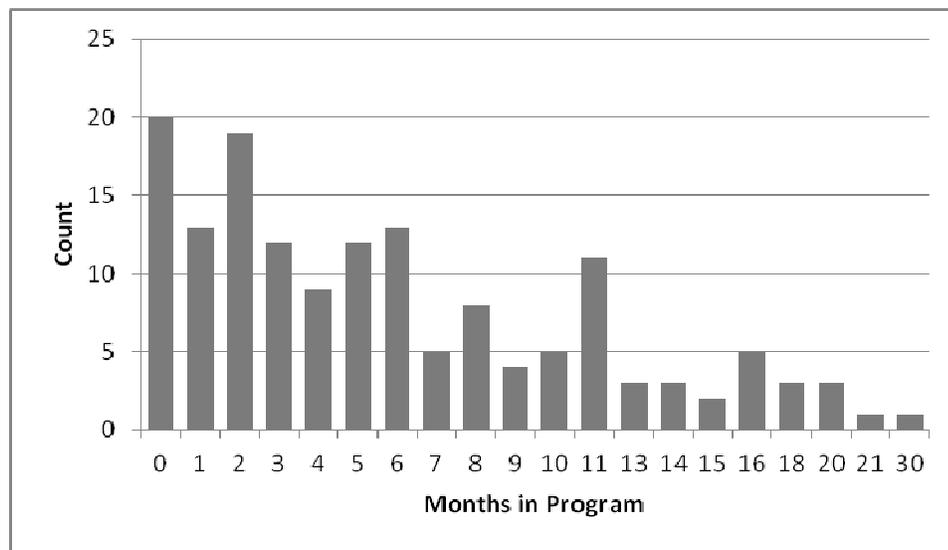


Figure 1. Length of stay in the program in months

Again, clients were grouped into three types of program exit: non-responders, logistical and autonomous early leavers, and treatment completers. In this sample, 40.5% of caregivers were coded as treatment completers, 39.2% of caregivers were coded as non-responders, and 20.3% of caregivers were coded as logistical or autonomous early leavers (**Figure 3**). If the two latter groups are combined, roughly 60% of the sample did not complete the program. Discharge information was not available for 4 individuals.

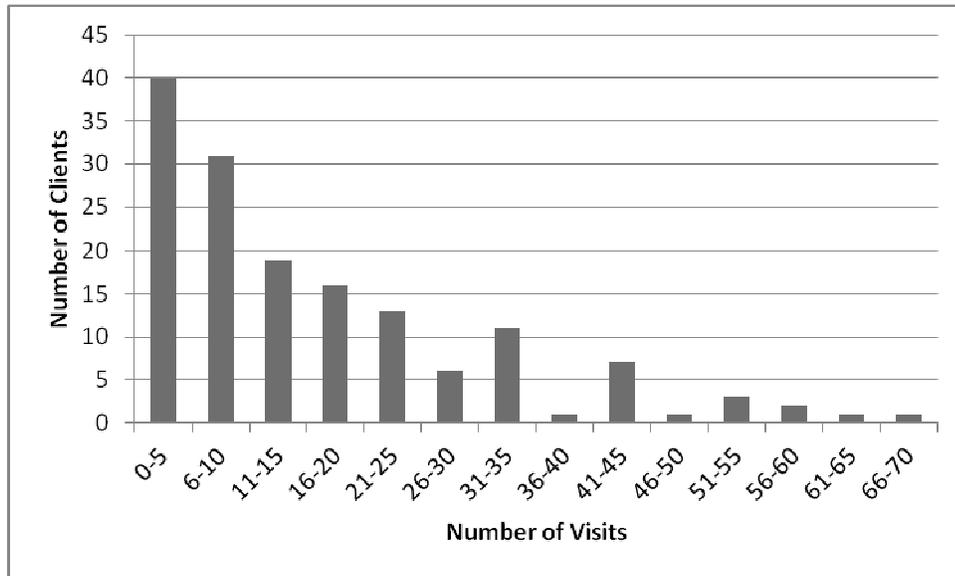


Figure 2. Number of visits

The results of an ANOVA comparing the average number of visits and months in the program for each type of program exit suggest a significant difference between the three groups in terms of the number of visits ($F = 19.63, p < .001$) and the length of stay in the program ($F = 22.67, p < .001$). Post-hoc analyses showed that the treatment completers significantly differed from both the non-responders and early leavers. The non-responders participated in an average of 9.31 visits ($SD = 9.02$) and remained in the program for an average of 3.29 months ($SD = 3.29$); the early leavers participated in an average of 14.60 visits ($SD = 12.99$) and remained in the program for an average of 5.13 months ($SD = 4.70$). The treatment completers participated in significantly more visits ($M = 24.10, SD = 15.80$) and remained in the program significantly longer for an average of 9.35 months ($SD = 6.27$).

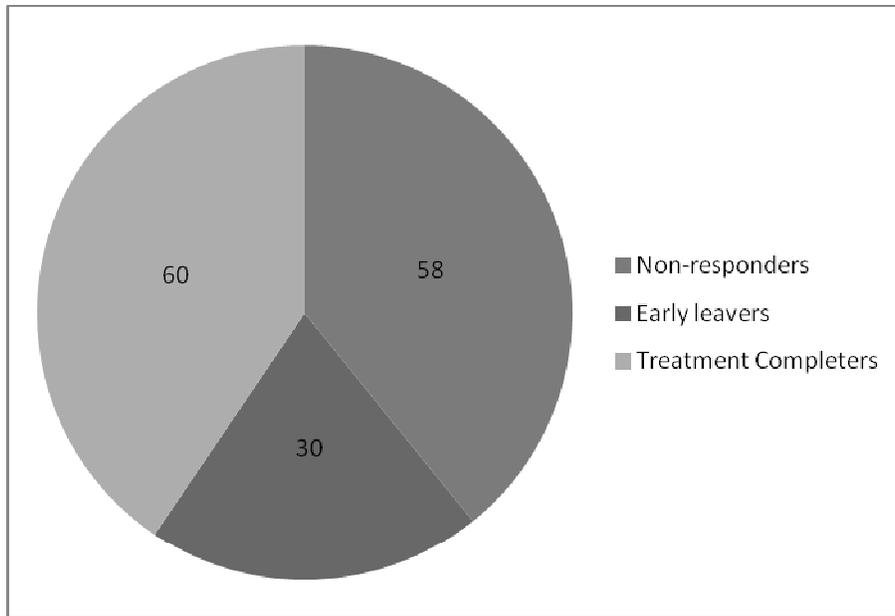


Figure 3. Number of clients demonstrating each type of program exit

Site differences in the type of program exits and number of visits. Chi-square analyses showed site differences in program exit [$\chi^2(4, N = 148) = 15.76, p = .003$]. Non-completion rates at Sites 1, 2, and 3 were 51%, 22%, and 42%, respectively. Follow-up tests using Holm’s correction for multiple comparisons suggest that the only significant pairwise comparison that was significant is that between Site 1 and Site 2 (**Table 3**). The probability of dropping out was about 2.32 more likely for clients sampled at Site 1 compared to clients sampled at Site 2.

Table 3.

Pairwise Comparisons of Program Exit by Site

Comparison	χ^2	<i>p</i> value (α)
Site 1 vs Site 2	15.005	.001 (.016)*
Site 2 vs Site 3	6.492	.039 (.025)
Site 1 vs Site 3	.911	.634 (.05)

Figure 4 further breaks down program exit by site using the three types of program exit. The graph shows that the distribution of each type of program exit looks different across the three sites. Site 1 had proportionately the greatest amount of clients stop responding to the program and comparable proportions of early leavers and treatment completers. At Site 2, the reverse pattern is shown, with the greatest proportion of clients at this site completing treatment and comparable non-responders and early leavers. Finally, at Site 3, there were comparable non-responders and treatment completers and fewer clients who were considered early leavers. To examine if a similar site difference existed in the number of visits clients experienced (quantity), a Chi-square test was used to evaluate the relation of site and number of visits (less than 5 vs. more than 5 visits). The result of this analysis was not significant as the proportion of clients that experienced 5 or fewer visits was similar across the three sites. Between 20% and 30% of the sample at each site experienced 5 or fewer visits.

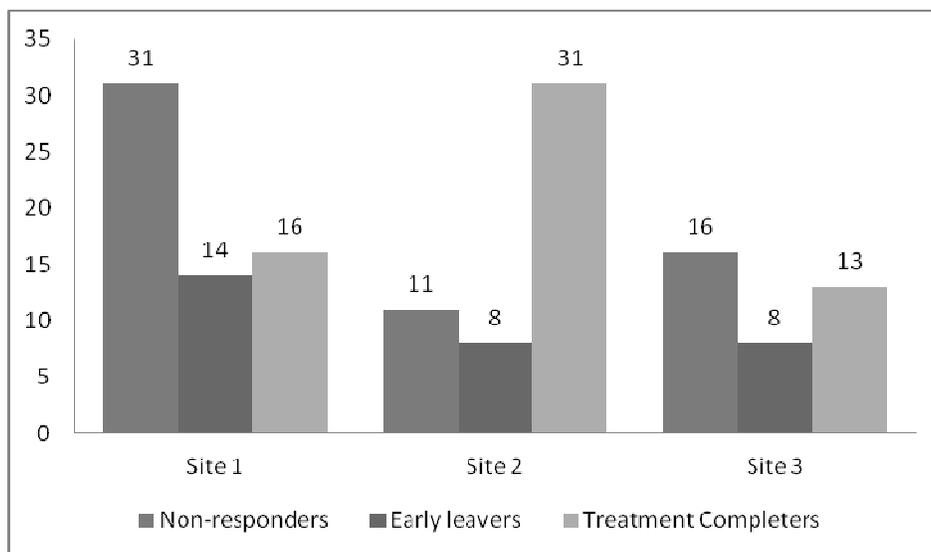


Figure 4. Cross-tabulation of program exit by site

Aim 2: Identify Patterns of Risk at Program Entry

The second aim was to examine patterns of risk at intake for this sample. Three domains of risk were included: *parent-child relationship stress* (PCRS), *parent depression* (PD), and *environmental stress* (ES). Preliminary analyses showed that, 41.4% of clients reported parent-child relationship stress that was above the clinical cut point (**Figure 5**). In terms of parent depression, 47.4% clients reported clinically relevant levels of depression. Interestingly, 85.5% of the sample reported environmental stressors above the cut point (high) with only 22 clients coded as low on environmental stressors. **Table 4** shows the correlations among the continuous scores from these three measures. The three domains were significantly related, but the moderate correlations suggest they are three distinct domains.

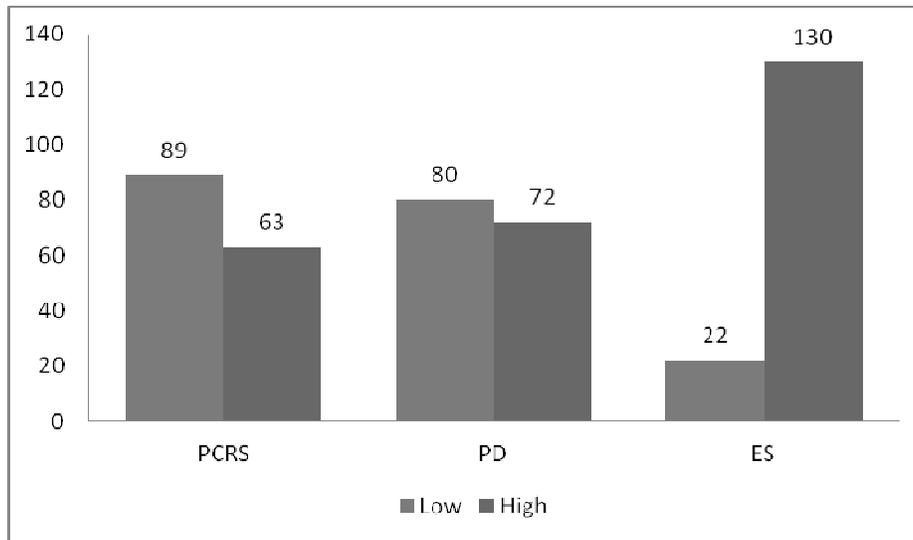


Figure 5. Number of clients reporting high and low levels of each risk domain

Table 4.

Correlations between Risk Measures

	PCRS	PD	ES
PCRS	1	0.47*	0.35*
PD		1	0.47*
ES			1

* $p < .001$

To explore patterns of risk across these three categorical domains, configural frequency analysis was used (CFA). This analysis tested for significant interactions between the three domains, using the z-test with the Holland-Copenhagen procedure for protecting alpha; the results are shown in **Table 5**. Before the CFA results are discussed, a few observations about the observed frequencies (F_O) of the configurations in **Table 5** provide some informative descriptives about the patterns demonstrated in this sample. Three patterns occurred very rarely. Two parents reported only high parent-child relationship stress. Three parents reported only elevated depressive symptoms, and one additional parent reported high scores on both of these risk domains but low environmental risk. Alternatively, two patterns were demonstrated by over half of the sample. Forty-seven families reported low parent-child relationship stress and depressive symptoms but high environmental stressors (configuration 4). An additional 45 parents reported high levels of stress in all three domains of risk (configuration 8).

Table 5.

CFA Results: Baseline Risk Configurations

Config-uration	Baseline Characteristics			F_O	F_E	Z	Sig Level	
	Parent-Child Relationship	Parent Depression	Environmental Stress					
1	Low	Low	Low	16	6.78	3.54	.0002	T
2	High	Low	Low	2	4.80	-1.28	.1007	
3	Low	High	Low	3	6.10	-1.26	.1046	
4	Low	Low	High	47	40.06	1.10	.1365	
5	High	High	Low	1	4.32	-1.60	.0551	
6	High	Low	High	15	28.36	-2.51	.0061	A
7	Low	High	High	23	36.06	-2.17	.0148	
8	High	High	High	45	25.52	3.86	.0001	T

Note: T = type, A = Antitype

The CFA then tested whether the observed frequency for each configuration was greater than or less than the expected frequencies. The expected frequencies are derived from the base model. In this analysis, the base model accounts for the main effect of each variable without any

interaction terms between the variables. The expected frequencies then are the amount of participants that would be expected to demonstrate that configuration by chance if there was no significant interaction between the three risk domains. The model fit for this first-order CFA model was $LR-\chi^2 = 43.05$; $df = 4$; $p < .001$, which suggests that there are large discrepancies between the base model and the data, so types and antitypes are anticipated. If the data does not fit the base model it suggests that there is a significant interaction between the variables that is not being accounted for in the base model. In this context, types are configurations that parents are presenting with at intake more often than would be expected by chance in the base model. An antitype, on the other hand, means that parents were less likely than expected by chance to present with this configuration at intake. Indeed, two types and one anti-type risk profiles were found in this sample.

The first type was those who were below the cut points on all three measures (configuration 1); that is, they reported that they were experiencing low levels of parent-child relationship stress and depressive symptoms and minimal environmental stressors. This group will be referred to as the low risk group. The frequency for which this pattern was demonstrated by families in this sample ($F_O = 16$) was significantly greater than the expected frequency of 6.78 families (F_E). Similarly, the second type was those who were high on all three risk domains (configuration 8). This type shows that the frequency of 45 families (F_O) who reported a co-occurrence of all three risk domains was greater than the expected frequency (F_E) of 25.52. Those demonstrating this configuration will be labeled as a high risk group.

The only anti-type was configuration 6, where parents were high on the risk indicators of parent-child relationship stress and environmental stress but reported low levels of depressive symptoms. Fifteen families (F_O) demonstrated this pattern, which was significantly fewer than

the 28.36 families that were expected to demonstrate this pattern (F_E). In other words, the base model predicted that more families would enter the program experiencing stressful interactions with their child and multiple environment stressors, without elevated depression symptoms, than actually did. Two other configurations were observed at lower than expected levels but, using corrected p -values that account for the multiple tests being conducted, were non-significant: 1) Configuration 7 where parents reported high levels of depression, environmental stress, and low parent-child stress was observed in 23 families, which was less than the expected 36.06 families, and 2) configuration 5, which consisted of parents who reported high parent-child relationship stress and depression but low environmental stressors, was only demonstrated by one parent, rather than the expected 4.32 families .

Aim 3: Describe Client Engagement

The third research aim was to describe the occurrence of the engagement qualities in the sample, particularly at the beginning (Initial) and end (Final) of involvement in the program.

Table 6 provides the frequencies and percentages for the levels of each engagement quality for both episodes. In the Initial episode of program participation, home visitors described nearly 80% of clients as generally compliant and cooperative in their affective response towards the home visitor, and two-thirds of clients were noted to share at least one instance of insight. However, connecting to services was relatively low during this Initial episode with only half of the sample having at least one note that discussed connecting to services. In the final episode, the percent of clients who were described as resistant or cooperative was similar to that in the Initial episode. A slightly lower percentage of clients were noted to reflect some insight. Finally, in the final episode, only 26.2% of the sample had no mention of connecting to services in their final case notes, which was about half of what was observed in the initial episode. In the final

episode, most clients (52.3%) were noted to be demonstrating low self-sufficiency in terms of connecting to services.

Table 6

Number and Percentage of Clients by Level of Engagement Quality

Engagement Quality	Initial Episode		Final Episode	
	<i>n</i>	%	<i>n</i>	%
Disposition				
Resistant	33	21.9	29	26.6
Cooperative	118	78.1	80	73.4
Insight				
None	51	33.8	44	40.4
Some	100	66.2	65	59.6
Connecting to Services				
Not discussed	73	48.3	29	26.2
Low self-sufficiency	78	51.7	57	52.3
High self-sufficiency	-	-	23	21.1

Aim 3a. As noted earlier, moments in which insight was provided by the client and noted in case notes occurred infrequently, and, therefore, additional analyses were conducted to examine moments of insight across the entire length of program involvement. The number of insights per client was divided by the individual’s total number of visits to create a proportion of visits for which insight was noted by the home visitors. For 28 clients (18.5% of the sample), insight was noted in at least half of the visits. For another 28 clients, there were no instances of insight noted throughout program involvement. For the remaining 63% of the sample, insight was noted as being offered in less than half of their visits. In the original coding scheme, one of the levels on insight was an absence of insight on the part of the client, i.e, when a client was unable to provide insight about the family’s experience when prompted by the home visitor. This situation was noted minimally; however, the rarity of the home visitors noting an absence of insight is potentially informative. This non-insight was only mentioned for 32 clients or 21.2%

of the sample. For 17 of the 32 clients, there was only one visit during which the home visitor noted that the parent was unable to provide insight. The greatest number of instances where a given client was noted to be unable to provide insight was five visits.

Aim 4: Relating Client Risk and Engagement to Program Exit

Aim 4a. Using client risk configurations to predict program exit. A predictive CFA was conducted to test if individuals demonstrating certain risk patterns at intake were more or less likely to exit the program in a particular way. In this model, the three predictor variables were the three risk domain (PCRD, PD, and ES) and the outcome was program exit. This analysis divides the observed frequency for each of the eight risk configuration presented in **Table 5** into the levels of the outcome or criterion variable. If the three categories of program exit were used in this analysis, the P-CFA would be testing 24 configurations (8 risk configurations by 3 levels of outcome variable). With only 148 clients included in this analysis, the observed cell frequencies would be too small across 24 configurations. Therefore, program exit was treated dichotomously, combining the non-responders and early leavers to form a group labeled non-completers. Non-completers was chosen as a label, rather than dropouts, because Child First does not have a prescribed dosage. Non-completers were then compared to the treatment completers.¹

The base model for a predictive CFA includes the main effect of each variable in the model as well as all interaction terms between the predictor variables (in this case between PCRS and PD, PCRS and ES, PD and ES, and PCRS, PD, and ES). It does not include any interaction

¹ The P-CFA was conducted with the other combinations of program exit (early leavers + treatment completers; non-responders + treatment completers) to isolate each category of program exit and ensure that no other dichotomous combination better fit the data. The other two combinations of program exit produced less significant results than the non-completers and treatment completers categorization (LR- $\chi^2 = 13.50$; $df = 7$; $p = 0.061$; LR- $\chi^2 = 4.32$; $df = 7$; $p = 0.752$), suggesting that in this sample the non-responders and early leavers were the most similar. Therefore, non-responders and early leavers were combined in all further analyses.

between the predictor variables and outcome variable, and the expected frequencies are the number of clients that would be expected by chance to demonstrate each configuration if there was no relation between the predictors and outcome. Therefore, if the base model does not adequately fit the data it suggests that there is a significant interaction between the predictor variables and outcome variables that is not being accounted for. Types or antitypes in this context suggest that individuals who demonstrate a particular risk pattern are more or less likely, respectively, to also demonstrate a particular type of program exit.

Table 7 shows the results of this analysis. To illustrate how to interpret this table, configurations 1a and 1b both relate to the group of families who are low on all three risk domains. Configuration 1a and 1b are dependent on one another. Configuration 1a provides the frequency for those who were in the low risk group and did not complete the program (Program Exit = 1). Nearly half of clients, seven of 15 clients, in this low risk group left the program early. Configuration 1b then provides the frequency for those who were in the low risk group and completed the treatment (Program Exit = 2). The remaining eight clients from the low risk group, therefore, demonstrated this configuration.

Again, before the results of the P-CFA are discussed, the observed frequencies (F_O) highlight common and uncommon patterns in this sample. As noted in the earlier Risk CFA, only six parents demonstrated the configurations where the client reported a high level of parent-child relationship stress or depression (or both) without concurrent environmental stressors. This table shows that all six of these individuals completed treatment as can be seen in configurations 2b, 3b, and 5b. Configurations 2a, 3a, and 4a all have a F_O of zero. Recall that the most common risk pattern in **Table 5** was those who were low on parent-child relationship stress and parent depression and reported high environmental stressors. Connecting this pattern to program exit,

configuration 4 in **Table 7** shows that 33 of the 46 individuals, or 72%, of those demonstrating this risk pattern did not complete the treatment; 13 clients completed treatment. In other words, reporting low parent-child relationship stress and depression and high environmental stress was associated with a high rate of non-completion.

Table 7.

Predictive CFA Results: Baseline Risk Configurations and Program Exit

Predictor Risk Configurations		Program Exit	F _O	F _E	Z	Sig Level
1a	Low, Low, Low	No	7	8.92	-0.643	0.260
1b	Low, Low, Low	Yes	8	6.081	0.778	0.218
2a	High, Low, Low	No	0	1.19	-1.091	0.138
2b	High, Low, Low	Yes	2	0.81	1.321	0.093
3a	Low, High, Low	No	0	1.78	-1.336	0.091
3b	Low, High, Low	Yes	3	1.22	1.618	0.053
4a	Low, Low, High	No	33	27.35	1.080	0.140
4b	Low, Low, High	Yes	13	18.65	-1.308	0.095
5a	High, High, Low	No	0	0.56	-0.771	0.220
5b	High, High, Low	Yes	1	0.41	0.934	0.175
6a	High, Low, High	No	8	8.92	-0.308	0.379
6b	High, Low, High	Yes	7	6.08	0.373	0.355
7a	Low, High, High	No	16	13.68	0.629	0.265
7b	Low, High, High	Yes	7	9.32	-0.761	0.223
8a	High, High, High	No	24	25.57	-0.310	0.378
8b	High, High, High	Yes	19	17.43	0.375	0.354

Note: Risk domains are listed in the order of parent-child relationship stress, parent depression, environmental stressors; Program exit is coded as No = Non-completers, Yes = Treatment Completers

To compare the observed frequencies to the frequencies that would be expected by chance if the risk patterns and program exit were unrelated, the P-CFA was conducted using the z-test and Holland-Copenhagen procedure. Model fit was LR- $\chi^2 = 16.31$; $df = 7$; $p = 0.022$, suggesting a significant discrepancy between the base model and the data. Despite the significant overall model fit, which means that the risk configurations do significantly predict

program exit, no individual configuration reached the level of significance required after alpha was protected (the first test, or the one with the lowest p -value, needed to be equal to or lower than .003 [0.05/16 configurations]).

The configurations that are bolded in **Table 7** are those that were found to be types in the initial risk CFA (see **Table 5**); however, these two risk patterns were not connected to completing or not completing treatment more than expected by chance. For example, the frequency of seven clients in the low risk group who dropped out of the program early was not significantly different from the 8.92 clients that were expected to demonstrate this configuration by the base model. Looking at the proportion of clients in the low risk and high risk groups, clients were about equally as likely to complete the program as they were to leave the program early. The one configuration that was trending towards significance was for those who reported high depressive symptoms only and successfully completed the program (configuration 3b). The three clients that demonstrated this risk pattern all completed the treatment, which was a greater frequency than the 1.22 clients that were expected.

Given the high proportion of clients who were only high on environmental stress and the very low frequency of clients who were high on one of the other two risk domains but low on environmental stress, I ran a chi-square analysis between environmental stress and type of program exit (non-completers vs. treatment completers). These two variables were significantly related to one another [$\chi^2(1, N=148) = 6.93, p = .008$]. **Figure 6** provides a visual of the interaction between these two factors, showing that those who were above the cut point on ES were more likely to not complete the program and those who were low on ES were more likely to complete treatment.

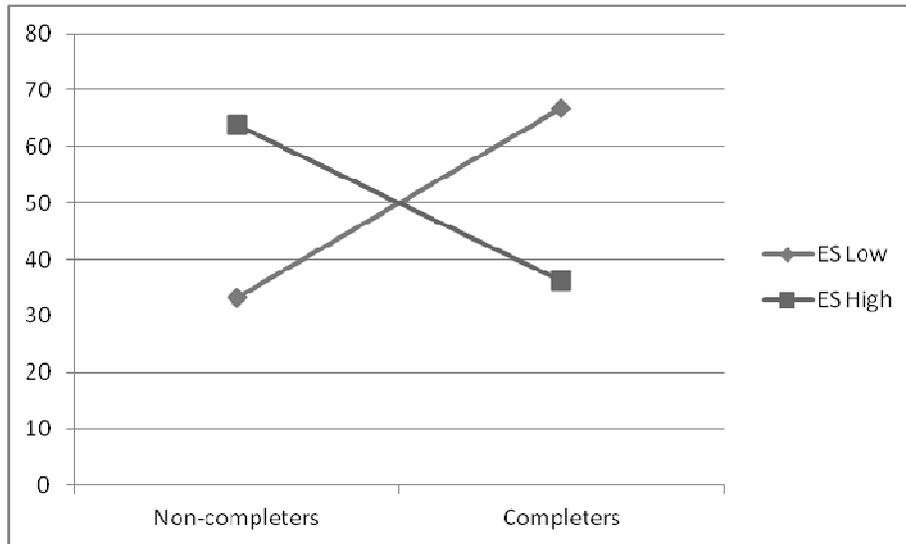


Figure 6. Cross-tabulation between Environmental Stress and Program Exit

As a result of the above analysis I choose to decrease the number of patterns being tested and highlight the relationships between environmental stressors and the other two risk domains through CFA. I combined the parent-child relationship stress and parent depression domains to create a *psychosocial stress* domain. This process created two groups, those who scored above the cut point on one or both of PCRS and PD domains and those who did not. Then, through P-CFA, the patterns of this new psychosocial stress domain and the previous environmental stress domain were used to predict program exit; the results are presented in **Table 8**. The greatest proportion of clients fell into the groups who were low on psychosocial risk and high on environmental risk (31% of the sample) and those who were high on both risk domains (56% of the sample). In both of the groups, clients were more likely to not complete the program than complete the program. Seventy two percent of those in the low psychosocial stress and high environmental stress group were non-completers and 59% of the high psychosocial and environmental stress group did not complete the program.

The base model for the P-CFA included the main effect of the two risk domains and program exit as well as the interaction between the two risk domains. A poor fit between the base model and the data would suggest a significant interaction between the risk domains and program exit. The model fit was $LR-\chi^2 = 14.84$; $df = 3$; $p = 0.001$, suggesting that types and anti-types are present in the data. Again, when the individual configurations are examined, the significance level of the configurations were not lower than alpha in this analysis. However, the relation between those who were high on psychosocial stress only and program exit approached significance (configuration 3a and 3b in **Table 8**), which again highlights the finding that those who were low on ES but high on one of the other two always completed the program in this sample. Low frequencies prevent this trend from being more robust.

Table 8.

Predictive CFA Results: Risk Configurations (with 2 categories) and Program Exit

	Predictor Risk Configurations		Program Exit	F _O	F _E	Z	Sig Level
	Psychosocial	Environmental					
1a	Low	Low	No	7	8.92	-0.643	0.260
1b	Low	Low	Yes	8	6.081	0.778	0.218
2a	Low	High	No	33	27.35	1.080	0.140
2b	Low	High	Yes	13	18.65	-1.308	0.095
3a	High	Low	No	0	3.57	-1.889	0.029
3b	High	Low	Yes	6	2.43	2.288	0.011
4a	High	High	No	48	48.16	-0.023	0.491
4b	High	High	Yes	33	32.84	0.028	0.489

Note: Program Exit is coded as No = Non-completers, Yes = Treatment Completers

Aim 4b. Using client engagement qualities to predict program exit. Next, the relation between the engagement qualities in the Initial episode and program exit was examined using chi-square tests. Results showed that there was not a significant relationship between initial disposition or initial insight and not completing the program. Connecting to services in the

initial six weeks, however, was significantly related to program exit [$\chi^2(1, N = 147) = 6.15, p = 0.013$]. Of the 73 clients where connecting to services was not mentioned in the Initial episode, 50 of them (69.4%) did not complete the program, whereas 37 of the 75 clients (49.3%) who did discuss services in the initial episode did not complete the program. Furthermore, when the clients who were low on environmental stress, who might not need services, are removed from the sample, the percentage of those who dropped out of the program when services were not discussed at all increases to 74.6%.

The relation between the engagement qualities in the final episode and program exit was also examined. Engagement towards the end of program involvement related differently to program exit than in the initial episode. At the end of the program, client disposition significantly related to program exit [$\chi^2(1, N = 106) = 26.33, p < 0.001$]. Among those who showed resistance in at least 20% of their final visits, 26 of the 29 (89.7%) clients did not complete the program.² Alternatively, when the client was described as cooperative and collaborative in the final visits, 51 of the 77 clients (66.2%) in this group did not complete the program. Showing resistance later in the program, as noted by the clinician, is related to the client disengaging rather quickly from the program.

The relation between insight and program exit was also significant at the end of the program [$\chi^2(1, N = 106) = 3.77, p = .05$]. Sixty-three clients were noted to demonstrate at least one instance of insight in the final episode and 26 of the 63 (41.3%) clients did not complete the program. Among the 43 clients where no instances of insight were coded in the final episode, 26 of them (60.5%) did not complete the program. Although this relationship is not as strong as

² Sixteen of the 26 individuals who showed resistance in the final episode and left the program early were non-responders and the remainder ($n = 10$) were in the logistical and autonomous early leavers group. Those sixteen individuals comprised 51.6% of all clients who had a final episode and did not complete the program. Similarly, the ten clients in the early leaver group comprised 47.6% of all logistic and autonomous leavers who had a final episode.

between disposition and program exit, it suggests that when home visitors noted that clients were able to offer insight by the end of their program involvement, clients were somewhat more likely to see the program through to completion. Since the inability to express insight in a given visit was only noted for 32 clients, I looked further at these clients. Eighteen of the 32 (56%) did not complete the program. Interestingly, connecting to services in the final episode was not significantly related to program exit.

4c Relation between risk patterns at intake and initial engagement qualities. Given the significant relation between discussions of connecting to services in the initial episode and program exit, a follow-up question is whether there is a relation between risk pattern at intake, connecting to services in the initial episode, and program exit. First, the relation between the risk patterns and connecting to services was analyzed through a first order CFA. In particular, this analysis explored whether the clients who did not discuss services in the initial weeks were also those who demonstrated the risk configuration that included only high environmental stress. The base model in this analysis included the main effect for all three variables with no interaction terms. The LR- χ^2 for this model is 15.02 ($df = 4; p = 0.005$) suggesting that the base model of main effects did not fit the data well and there is a significant interaction between these three variables. **Table 9** shows the results of the CFA, which align with the risk CFA conducted in Aim 2 (see **Table 5**).

Table 9.

CFA Results: Baseline risk and Initial Connecting to Services

Configuration	Psychosocial Stress	Environmental Stress	Initial Connecting to Services	F _O	F _E	Z	Sig Level
1	Low	Low	No	10	4.70	2.44	.007
2	Low	Low	Yes	6	4.89	0.50	.308
3	Low	High	No	28	26.17	0.36	.360
4	Low	High	Yes	19	27.23	-1.58	.057
5	High	Low	No	4	6.57	-1.00	.158
6	High	Low	Yes	3	6.84	-1.47	.071
7	High	High	No	32	36.56	-0.75	.226
8	High	High	Yes	49	38.04	1.78	.038

Configuration 1 was the most significant configuration, but just above the alpha threshold of .0062. As would be expected, those who were in the low risk group, i.e., low on both risk domains, were more likely than expected to have no discussion of services in the initial episode. Similarly, configuration 8 trended towards significance showing that those who were high on both risk domains were more likely than expected (F_O of 49 compared to the F_E of 38.04) to discuss connecting with services in the initial weeks. Sixty percent of those who were high on both risk categories did discuss connecting to services in the initial episode. However, it is important to note that 40% of this group did not discuss services in the initial episode (configuration 7), which is still a large portion of clients. Finally, configuration 4 suggests that the frequency of clients who were high on environmental stress only and discussed connecting with services in the initial episode (F_O = 19) was less than the 27.23 clients that were expected to demonstrate this pattern. In other words, among the 47 clients who were high on environmental risk only, 60% did not discuss connecting with services at all in the initial weeks.

4d Patterns of risk and engagement qualities predicting program exit. A first-order predictive CFA was then conducted to test all three components of the model. In this model, the

predictor variables were Psychosocial Stress, Environmental Stress, and Initial Connecting to Services; the outcome was program exit. The base model was specified to include the main effect of all four variables and all interaction terms between the three predictor variables. Therefore, the model tests for any interaction between the first three predictor variables and the outcome variable, program exit. In other words, each of the 8 configurations presented in **Table 9** are divided into those who did not complete the program (a) and those who completed the program (b) in **Table 10**.

Table 10.

P-CFA Results: Psychosocial risk, Environmental Risk, and Connecting to Services in the Initial Weeks Related to Program Exit

Config-uration	Predictor Variables			Program Exit	F _O	F _E	Z	Sig Level
	Psycho-social	Environ-mental	Initial Connecting to Services					
1a	Low	Low	No	No	6	5.33	0.29	.385
1b	Low	Low	No	Yes	3	3.67	-0.35	.362
2a	Low	Low	Yes	No	1	3.55	-1.35	.088
2b	Low	Low	Yes	Yes	5	2.45	1.63	.052
3a	Low	High	No	No	21	16.57	1.09	.138
3b	Low	High	No	Yes	7	11.43	-1.31	.095
4a	Low	High	Yes	No	12	10.65	0.41	.400
4b	Low	High	Yes	Yes	6	7.35	-0.50	.310
5a	High	Low	No	No	0	2.37	-1.54	.062
5b	High	Low	No	Yes	4	1.63	1.85	.032
6a	High	Low	Yes	No	0	1.78	-1.33	.091
6b	High	Low	Yes	Yes	3	1.22	1.60	.054
7a	High	High	No	No	23	18.35	1.09	.139
7b	High	High	No	Yes	8	12.65	-1.31	.095
8a	High	High	Yes	No	24	28.41	-0.83	.204
8b	High	High	Yes	Yes	24	19.59	1.00	.160

Note: Program Exit is coded as No = Non-completers, Yes = Treatment Completers

Note the observed frequencies in the high risk groups (configurations 7 and 8). As reported in Aim 4c, for 40% of the 32 individuals in the high risk group, connecting to services

was not mentioned in the case notes from the initial episode (configuration 7 in **Table 9**). Configuration 7a in **Table 10** shows that 23 of the 31 clients in this group, or 74.2% of this group, did not complete the program. Similarly, among the group who reported high environmental stress only and whose visit notes did not mention connecting to services in the Initial episode (configurations 3a and 3b), 75% of these clients did not complete the program. These findings further highlight the interaction between facing high environmental stress and an early exit from the program when service needs are not mentioned in case notes early on.

The model fit for this model was LR - $\chi^2 = 25.58$, $df = 7$, $p < .001$, suggesting a significant interaction between the predictors and the criterion variable. However, **Table 10** shows that the expected and observed frequencies of the configurations were not different enough to clearly point to types and antitypes. The seven clients who were high on psychosocial stress and low on environmental stress, regardless of whether they discussed connecting to services initially or not, completed the program (i.e., all 7 clients across configurations 5a, 5b, 6a, 6b successfully completed the program), which is in line with the earlier P-CFA with initial risk patterns and dropout.

To clarify the relation between the all of the predictor variables and program exit, a more complex model that was inappropriate for CFA with the current sample size was tested using logistic regression. Non-completion and treatment completion were used as the two levels of the outcome variable. Site was entered in the first block; the PCRS cut score, PD cut score, and the ES cut score were entered in block 2; disposition and connecting to services in the initial episodes were entered in block 3; and disposition and connecting to services in the final episode were entered in block 4. Results showed that site, Site, High Environmental Stress, and final disposition were significant predictors of non-completion (**Table 11**).

In all models, site is a significant predictor of not completing the program. In Model 4, the difference between Sites 1 and 2 is again demonstrated here. Being at Site 2 serves as a protective factor decreasing the likelihood of not completing the program (O.R. = 0.15). The only risk characteristic that was a significant predictor of dropping out was environmental risk; Model 4 shows that those who were high on environmental stressors were 7.70 times more likely to not complete the program after controlling for all the other variables in the model. Neither engagement quality in the initial episode significantly predicted non-completion of the program, but final disposition was a significant predictor of not completing the program, with those who were noted to demonstrate resistance in the final episode were 23.85 times more likely to drop out of the program.

Table 11.

Logistic Regression predicting Non-Completion of Treatment

Predictor	Model 1: Site Only		Model 2: Model 1 + Risk Variables		Model 3: Model 2 + Initial Engagement Variables		Model 4: Model 3+ Final Engagement Variables	
	B	O.R.	B	O.R.	B	O.R.	B	O.R.
Site**								
Site1 vs 2	-1.46**	0.23	-1.41**	0.24	-1.29*	0.28	-1.89**	0.15
Site 1vs3	-0.69	0.50	-0.72	0.49	-0.85	0.43	-1.11	0.33
High PCRS			-0.56	0.57	-0.68	0.51	-0.77	0.46
High PD			-0.01	0.99	0.14	1.15	0.41	1.50
High ES			1.97**	7.17	2.17**	8.73	2.04*	7.70
Initial Disposition					1.05	0.35	-0.83	2.85
Initial Connecting to Services					0.57	0.57	-0.56	1.76
Final Disposition							3.17***	23.85
Final Connecting to Services								
None vs. Low							0.84	1.15
None vs. High							0.46	0.52

Note: For Site, Site 1 is the reference group. Non-completion is coded as 1 for the outcome. For Disposition, resistance is coded as 1. For connecting to services, no visit notes discussing connecting to services is coded as 1 in the initial episode and 2 in the final episode.

* $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

The aim of this study was to explore patterns of stressors in families at intake and the quality of parent engagement, and how both of these factors related to the likelihood of completing treatment in an evidence-based home visiting program. The target population for Child First is families who are living in high toxic stress environments, as these clients are often the hardest to engage in services. The goal of the program, therefore, is to provide comprehensive, wrap-around services to address the multifaceted needs of the family.

The sample for the current study was drawn from closed cases at three Child First sites in three different cities in Connecticut. In some respects, the demographic makeup of the current sample was similar to those from previous Child First studies (Crusto et al., 2008; Lowell et al., 2011) with the sample consisting mainly of non-teen parents (mean age = 27 in Lowell et al., 2011) and a majority of clients identified as Hispanic (nearly 60% of the sample identified as Hispanic, another quarter identified as African American, and less than 10% Caucasian).

Distinct from earlier studies of Child First, however, were child age, gender, child welfare involvement. The current sample consisted of a greater percentage of children between the ages of three and six (i.e., the Lowell et al. RCT only included children under the age of three) and a greater percentage of male children than the samples in Lowell et al. and Crusto et al. The greater proportion of male children in this sample may be related to the fact that three quarters of the children were preschool-age. Research shows a higher rate of behavior problems, particularly externalizing behaviors, in male preschool-age children than girls of the same age (Lavigne et al., 1996). Problematic behaviors may have drawn the attention of staff at early education and other early childhood settings, who refer to Child First, creating the over-representation of male children. Reasons for referrals were not captured in this study but early

care settings were the largest referral source in Crusto and colleagues (2008) sample of Child First families. Less is known about how well families with children in this older range fare in Child First as they were not included in the RCT. Finally, half of the sample had some past or present involvement with the state child welfare agency, which is greater than the 30% reported in the RCT of Child First (Lowell et al., 2011). Home visiting services are often provided to families who have experienced child maltreatment in the past or who may be at risk for engaging in maltreatment (Ammerman et al., 2006; Gomby, 2007; Sweet & Appelbaum, 2005), as is the case in this sample.

Length of stay in the program varied widely from less than a month to over a year, with an average that was a bit lower than the average of 22 visits reported in the RCT (Lowell et al., 2011). A quarter of the sample only participated in five or fewer visits. These findings underscore the difficulty of retaining many families in home visiting programs and the likelihood of parents leaving the program after only a few visits (Azzi-Lessing, 2011; Gomby, 2007).

The goal of this study was to explore factors that increase or decrease the likelihood of completing the program. Treatment completion in this study was this optimal exit from the program. The non-completers, then, were those who ended their involvement in the program before the program staff would have preferred or otherwise agreed to. Around 60% of the families in this study did not complete the program, which falls within the range reported by previous studies of other home visiting programs that tend to have a specified duration of service built into the model (Ammerman et al., 2006; Ingoldsby, 2010). For example, Roggman et al. (2008) reported a 40% drop out rate from a sample of EHS parents and Korchmacher et al. (1998) found that 94% of the sample did not receive the prescribed number of visits in a sample

of parents receiving Nurse-Family Partnership, with the average being slightly over half of the prescribed number of visits.

Within the 60% who were non-completers, 66% were coded as non-responders and 34% were autonomous and logistical early leavers (39% and 20% of the total sample respectively). Descriptively the non-responders and early leavers form two separate paths of exiting the program, in that the early leavers were able to communicate their desire to end services early before ending their relationship with the home visitors. Reviews of engagement and dropout from the counseling and child welfare literature note that the inability to communicate needs and acknowledge the need for services are a barrier to adherence to treatment and attendance (Littell et al., 2001; Staudt, 2007), and this same skill may influence the way in which clients choose to leave a treatment program. This is the first study in the home visiting literature to conceptualize differences between those who communicate and articulate their desire to end services and those who choose to stop communicating with the program. However, these two groups did not differ in terms of their frequency or duration of program involvement, and the sample size limited the use of this distinction between non-responders and early leavers in the remaining analyses.

Specifically, this study focused on the relation between psychosocial and environmental stressors and parent engagement program completion. The literature suggests that families who are experiencing the greatest number of stressors are the hardest to retain and engage in services (e.g., Kazdin et al., 1997; Roggman et al., 2008). Indeed, nearly every family in this sample reported elevated stress in at least one of three potential areas, parent-child relationship stress, depressive symptoms, and environmental stress, and just over half of the sample reported experiencing elevated stress in at least two of the three domains. Most notably, CFA results showed that the frequency of clients that reported elevated stress in all three areas was greater

than expected by chance. Families experiencing many stressors are often facing too many competing priorities and responsibilities that detract from their ability to prioritize participating in family services. In this study, just over half of this high risk group did not complete the treatment, similar to results reported by Kazdin and colleagues (1997), who found that half of their high risk group dropped out of treatment. Furthermore, connecting to other community services was not mentioned in the case notes in the initial visits for most of those who reported elevated stress in all three areas and did not complete the program.

Although the high environmental stress pattern was not significantly related to non-completion in the person-centered analyses, this pattern was the most commonly observed in this sample, with 31% of the sample following this pattern, and environmental stress was a significant predictor of non-completion in the final regression model. Therefore, this group is worth highlighting. Three-quarters of those reporting only high environmental stress did not complete the program, the highest rate of non-completion across all of the risk profiles. Moreover, similar to the overall high stress group, when connecting to services was not discussed in the initial weeks, the likelihood of not completing the program was extremely high.

Although the common occurrence of the high environmental stress pattern is not surprising given the target population of families experiencing multiple areas of vulnerability (Ammerman et al., 2006; Azzi-Lessing, 2011; McGuigan et al., 2003), the non-completion rate is high and concerning. There are several potential reasons families with high environmental stress did not complete treatment. Other researchers (Kazdin et al., 1997; Roggman et al., 2008) found that clients often reported a lack of time to dedicate to appointments and changes in employment and schedules as common reasons for not remaining in services, suggesting conflicting priorities in their environment. In addition, communication is often very difficult to maintain, particularly

among low-income, highly vulnerable families who may not have stable housing and employment (McGuigan et al., 2003; Roggman et al., 2008). Finally, clients who are not simultaneously experiencing elevated psychosocial stress and environmental stress may feel that the program is not fitting their needs, since strengthening the parent-child relationship is a key piece of this intervention model. It would be worthwhile to further explore barriers to treatment completion for this group, and potentially create additional engagement strategies for families demonstrating this risk pattern that help retain these parents.

For families that reported high stress in all three domains or high environmental stress only, the lack of a discussion of connecting to services in the case notes from the initial visits was an important factor for not completing the program. Care coordinators are a part of visits from the beginning of program participation. They assess service needs in the beginning and complete visit notes about their coordination efforts throughout program participation. Past studies found that parents in Child First received or were connected to approximately 85-90% of their requested services across their time in the program (Crusto et al., 2008; Lowell et al., 2011). The findings in the current study suggest that for some parents there may be a need to address services more explicitly in the first few visits. Some parents may feel a sense of urgency around addressing their concrete needs, which they may expect the program to assist them with soon after entering the program. Ensuring that greater efforts are made to refer families to services or bring materials to the family in the initial weeks of participating in a home visiting program while assessments are being completed and relationships are being formed, may improve engagement at the beginning and overall retention of some families who tend not to complete the program.

One trend found in the CFA models was that parents who expressed high psychosocial stress (in the form of dissatisfaction with the parent-child relationship or clinically relevant depressive symptoms) but low environmental stress were more likely to complete treatment regardless of whether their case notes mentioned connecting to services in the initial visits. However, only six clients displayed the pattern of high psychosocial stress and low environmental stress, precluding stronger conclusions from being drawn about the success of retaining this group. A larger sample size would further clarify if clients referred to this program rarely demonstrate this pattern at intake as these results would suggest, and when it is demonstrated whether these clients are in fact more likely to complete the treatment. Interestingly, Roggman and colleagues (2008) and Gross, Julion, and Fogg (2001) both found that parent depression and stress did not predict dropout in their regression analyses. The results of this study adds to these findings, suggesting that when depressive symptoms or stress in the parent-child relationship is not paired with simultaneous environmental stress clients may be more likely to complete the program. However, the combination of psychosocial stress with environmental stress in this sample increased the likelihood of not completing the treatment.

Finally, eleven percent of this sample report low stress in all three measured domains. This is a small percentage of this sample, but the CFA showed it was observed at a significantly greater frequency than expected by chance. Furthermore, about half of this low risk group did not complete the program. Logical explanations could be argued for low risk clients completing and not completing the program. Perhaps some of the families in the low risk group left the program early because they realized that their needs did not match the program model or they were not in need of the services. Alternatively, some of the low-risk parents may be experiencing stress in another area, which the program is able to address, facilitating their

engagement in the program and enabling them to complete the program. These results highlight the importance of addressing other key risk factors that might be present in the family environment and clearly defining target populations for specific home visiting programs to identify which risk profiles fit well with the program goals (Azzi-Lessing, 2011). Further exploration of additional and relevant risk factors would add to the home visitor's ability to create useful profiles of risk as clients enter the program, which could also inform treatment plans. If these families are at low risk, these clients may be less likely to significantly benefit from participating in a home visiting program and might be screened out at entry.

The regression model points to two other findings that are worth noting. First, the types of program exit differed across sites and site was a significant predictor of program exit in the regression models. This study did not account for other contextual, community variables that may influence program implementation across sites (Daro et al., 2012; Matone et al., 2013). In a review of the home visiting literature, Azzi-Lessing (2011) points out that one limitation of the literature is that most evaluations do not account for community factors that affect the program's ability to provide services to clients. For example, a home visiting program's ability to connect clients to housing services is dependent on the availability of housing option in the surrounding area and the program's relationship with other service providers in the area. Each community is different in terms of the resources available and the network of providers (Gomby, 2007).

The context for intervention is three different types of agencies that provide Child First services across the three sites included in this study: a hospital, community health center, and family service agency. In addition, they are located in three different towns and cities throughout the state, which affects the referral sources and the availability of other community services in that city or town. In other words, if Child First is filling a larger service gap in one

community, they likely will receive a wider range of types of clients since other early intervention programs are not available. Staff characteristics and rate of turnover may also help to explain site differences in program exit. It is important to document and understand the contextual factors that may lead to varying program outcomes.

Second, client disposition in the final episode was also a significant predictor of treatment completion. Ninety percent of clients who demonstrated resistance and withdrawn behavior in their final visits did not complete the program. In Jack and colleagues' (2002, 2005) interviews with home visitors and parents, both groups discussed behaviors such as being withdrawn, resistant, or distracted as indicators that the parent was not engaged with the home visitor. In line with these findings, many families who choose to leave Child First earlier than prescribed demonstrated greater instances of distancing behaviors before ending their contact with the program. Alternatively, those who completed the program showed fewer distancing behaviors in their final visits, likely because they were transitioning out of the program. This finding provides valuable feedback to home visitors as this could be a critical time to implement different strategies for engaging the client. Parents who are showing resistant and withdrawn behavior across consecutive visits later on in program participation may be a critical time where home visitors can increase their efforts to engage parents and maintain greater contact with the family.

Strengths and Limitations

This study utilized a person-centered approach to explore patterns of elevated stress in families at intake, exploring interactions between stressors within individuals. As such, this was a first attempt to align the measurement of multiple stressors with the way in which vulnerable families actually experience stress in their environment. That is, any one risk factor may not

individually cause the family distress, but in combination with other risk factors it may become problematic to the well-being of the family. Configural frequency analysis allows for the examination of unique interactions between variables. In this study, it allowed for the investigation of environmental risk, a very common risk domain found in a sample of families who received home visiting services, in relation to two psychosocial risk domains, the parent-child relationship and parent depression. Through this approach, patterns or profiles of risk for clients in this program could be created and the frequency with which each pattern was observed was presented.

The results of this study also highlight the potential challenge to a person-centered approach. In order to properly account for the complexity of an individual family's program experience, a large number of variables would need to be included in the model. Every variable added to the model is then crossed with all the other variables in the model and the number of configurations being tested multiplies quickly. Therefore, large sample sizes are required for obtain adequate power for very complex models. A major limitation of this study was the small sample size. One hundred and fifty families did not provide enough power to detect significant effects in many of the analyses and limited the complexity of the models that could be tested. A larger sample in this study, which was not possible due to time restraints in data collection, is needed to explore the effect of multiple risk and engagement qualities on program exit in one model.

In addition to the literature on family risk, this study also adds to the literature on engagement and the ways in which the construct is defined and measured. It is one of the few studies in the home visiting literature that measured engagement as something other than a quantity, such as length of stay in the program and number of home visits. While these

indicators are useful and valuable, they do not provide information about the quality of the engagement, or the parent's affect and behavior in the visit. Theoretical models of engagement (e.g., King et al., 2014, Korfmacher et al., 2008; McCurdy & Daro, 2001) acknowledge that a critical component of engagement is active involvement during home visits and note the variability of engagement over time. This study aimed to further define and capture the quality of engagement within each visit by examining four features: client disposition, insight, practicing skills, and connecting to services. These qualities were coded from case notes that were not specifically intended to measure features of engagement. Despite this fact, the features of engagement were mentioned in between 27 and 97% of the case notes coded in this study, suggesting that these features are in line with the home visitor's reflections of the parent's affect, behavior, and communication, or the quality of their engagement, during visits.

Whereas the home visiting notes appeared to capture the quality of client engagement, they also contributed to some study limitations. First, the notes were designed for clinical (as opposed to research) purposes and the notes were often incomplete or missing information about the features of engagement of concern in this study. A particular quality indicator could only be measured in a given visit if it was mentioned; therefore, data that were "missing" in this study meant either a lack of occurrence or an absence of noting the event. For example, the absence of a conversation about connecting to services did not necessarily mean that no conversation occurred. The engagement data also had problems with reliability because the ratings of each quality indicator were not available for every visit. This was particularly problematic for practicing skills, which did not was not noted with enough frequency to be used in the analyses. As a result, stronger conclusions could not be drawn and more dynamic trajectories of engagement over time could not be tested.

Another limitation is the absence of parent's own perspective on their engagement in services. Past research suggests that the parent perspective is often different than the home visitor perspective (Altman, 2008; Korfmacher et al., 2008). Although bias needs to be considered when using a single perspective, engagement from the home visitor perspective can be useful as visitors have experiences with numerous families and may be able to be more objective in their ratings of engagement. In addition, there is added value in the home visitor having a forum to reflect on the affect, behaviors, and verbal communications of a parent because it influences his or her approach to future interactions with the parent.

Finally, this study incorporated patterns of stress at intake, engagement, and likelihood of completing the program in the same study. Although high attrition rates has been cited as a major challenge for many home visiting programs (Azzi-Lessing, 2011), few studies have used program dropout or exit as an outcome, including in the sample both those who left the program early and those who completed the program. This comparison can provide some of the most valuable feedback to home visiting programs as it acknowledges both successes and challenges in program processes. Moreover, these constructs were measured outside of a randomized control trial and within real, community-based implementation settings in order to explore program processes within a community context.

However, some variables of interest were not available since this study used secondary data. For example, the absence of additional community and program indicators is a limitation of this study. Community-level indicators, such as the percent of low-income families, housing instability, and social cohesion, and where home visiting services fall within the landscape of community providers in a given community might help to explain attrition and identify additional barriers to treatment. Program characteristics such as strategies of engagement

implemented with families, staff characteristics, and staff turnover rates are likely also indicators that influence program outcomes and were not available in the present study. This study did not incorporate any measure of fidelity to the model or program characteristics, which limits what can be said about the implementation context. In addition, no measures of the strengths of the family that served as assets in treatment participation were available.

Implication for Future Research

Future studies should build on this study by continuing to create contextual models of program participation that incorporate parent characteristics and engagement qualities and add community-level factors. In particular, data on larger samples should be collected so that the analyses will have enough power to test for significant interactions within individuals. As more complex models are built with larger samples, additional domains of potential stress as well as community-level indicators should be included in order to further evaluate the effect of community characteristics on service provision. In fact, under the federal Maternal, Infant, and Early Childhood Home-Visiting (MIECHV) program, strides are being taken to address the contextual and community component of implementation. Through the Program Evaluation arm of this initiative, 85 sites, that are implementing one of four evidence-based home visiting models, will be evaluated not only for the effectiveness of the program overall but the context of the implementation in a given community will also be evaluated (<http://mchb.hrsa.gov/programs/homevisitng/>). In addition, a home visiting research network has been established under this initiative and they have created a national research agenda for the home visiting field that includes promoting successful adoption and adaptation of home visiting models as well as coordination with other services (www.hvrn.org).

The role of environmental stress should also be further explored in future studies. The relation between environmental stress and not completing the program was a key finding in this study. Future studies should examine additional differences in program processes between those who report elevated environmental stress without additional psychosocial stress and those who report elevated stress in both areas. This information could inform decisions around who the target population is for this home visiting model.

Furthermore, the data in the current study could be improved on in two additional ways. First, the quality of engagement could be measured after each visit for current clients. These data could be collected using the coding scheme developed in this study; home visitors could complete ratings of the features of engagement after each visit, which would allow for the examination of engagement at more than two time points to further understand the process of engagement over time. Stability and change within clients' quality of engagement could be explored with prospective data by modeling trajectories of the engagement qualities or looking at whether the client demonstrates the same level of each quality across different episodes or time periods. These on-going ratings would also provide continuous feedback to the home visitor about their relationship with the parent or caregiver and challenges or successes they might be facing in engaging the family. Second, with a sufficient sample size, additional studies should explore whether distinguishing between the two qualitatively different ways of exiting a program, communicating a desire to end services and stopping responses to the program, is valuable and informative, particularly around how they relate to other program processes including engagement.

Finally, similar to other home visiting programs (McGuigan et al., 2003), Child First emphasizes, as part of their program model, making multiple, varied attempts to contact a family

to engage the family in services, yet Lowell et al. (2011) noted that there were many missed visits and cancelled appointments in their sample. Indicators of the number of attempts to contact a family and number of missed appointments are hard to capture and were not included in this study. More accurate rates of missed appointments and a more nuanced examination of the frequency of completed visits would shed light on the challenges with maintaining communication with families and whether difficulty reaching families is related to not completing treatment.

Conclusion

The complexity of a family's experience in an intervention is challenging to capture but is critical to understanding the effectiveness of services. In a world of constantly decreasing resources and funding, evaluation can play a key role in highlighting processes that explain program outcomes. Client engagement is an underlying process in every intervention, and it can promote program retention and be facilitated by a clear understanding of the barriers to treatment or vulnerabilities that families are experiencing. This study reaffirms that, as noted in the program mission, families are presenting to Child First with a lot of need, and it preliminarily investigated the processes that promote family engagement and retention in services. This line of inquiry has clear clinical and research implications as the ultimate goal of service provision is to address the needs of clients and promote well-being in families in a way that is sustainable and perceived as beneficial. Therefore, it is important to assure that services are designed and implemented in such a way that they are viewed as acceptable and experienced as effective.

Appendix A

Parent Engagement Coding Scheme

Qualities of Engagement:

1. **Parental Disposition** during visit (Select one)- What was the caregiver’s **tone, affect, and behavior** in the visit *toward the care coordinator or clinician*? How willing was she/he to collaborate with CF team? Note, when considering affect, being sad or mad does not automatically mean the parent is reluctant or not involved. The parent may be mad or sad about their own situation in life but still willing to participate in and engage with the clinician/care coordinator.

99	Unknown	There isn’t enough information to make a decision. If you later note that the parent did or did not show progress or have a learning experience, you should NOT use a 99 in disposition
0	Not Involved	<ul style="list-style-type: none"> • Non-compliant, refuses to participate in visit • Withdrawn, Hostile, Disruptive • Guarded, Resistant
1	Reluctant	<ul style="list-style-type: none"> • Present but disconnected, watching from afar (at a distance, not sitting in with the team and child), • multiple, long moments of distraction or giving up and leaving the interaction (physically or mentally) • pushing back on accepting services
2	Hesitant	<ul style="list-style-type: none"> • Initially struggled at beginning but came around, needed guidance or cues but eventually became involved or interactive • disengaged for a long moment during the visit but eventually comes back to participate • wavering between being agreeable (recognizing need for services) and pushing back on accepting help • wavering, does some of the things asked in between periods of refusal (e.g. misses many visits but acknowledges need for service in the current visit)
3	Compliant	<ul style="list-style-type: none"> • Agreeable without the negative attributes, • shares concerns, engages in conversation (but isn’t particularly collaborative), • going through the motions, doing what is asked (nothing more, nothing less), participating, cooperative • <i>momentarily</i> leaves/gives up/disengages when frustrated but quickly returns
4	Actively Involved	<ul style="list-style-type: none"> • Fully participated, interested, collaborative, interactive in visit with child or visitor • works through frustration or struggle during the visit to stay with the interaction

		<ul style="list-style-type: none"> • fully participates in the activity presented during visit • going beyond what is asked; offers information that would otherwise not have been brought up • offered a specific example of something that occurred in between visits- talk about the situation as well as the response (gives complete story) • noted that they implemented or practiced the techniques or changes discussed with the team in between visits, reaches out to the team for a visit because in need
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2. **Insight about work** (Select One)

99	Unknown	Unclear if there was an opportunity for it or whether parent shared anything
0	No Insight	No insight, reports not seeing value in the work, does not reply or says I don't know when asked reflective questions (non-responsive)
1	Some	Basic insights, provides some information, makes an observation, provides some reasons for behaviors or situations
2	Significant	Has a great moment of insight between visits that he/she shares, parent has a change in language, a breakthrough or light bulb moment, significant change in mindset

If a reflection or insight was noted, was the focus of reflection or insight (can choose more than 1):

- A. **About child:** understanding or recognizing what the child does and *why* he or she does it, identifying changes in behavior and potential reasons for the changes
 - B. **About parent's own life or role in the current situation:** identifying the way parent feels in response to what is occurring within the family (which may be effecting ability to parent); acknowledges or identifies the effect that the parent's behavior towards child has on child or the effect that the parents' behavior not geared toward the child effects child's environment
 - C. **About past experiences (history):** identifying the influence her past experiences have had on her or made her the person she is, *refers to finished or closed situations in parent's life (prior to CF's presence in their life)*
3. **Experienced a learning moment** (Practices something) – refers to anything new the parent practices during a visit, such as learning to play with child, writing resume, speaking to a doctor, regulating emotions. It is something that is noted that the parent needs to work on or a skill that should be built.

99	Unknown	It is unclear from the note whether a learning moment occurred
0	No	Clinician or case manager noted trying to get the parent to practice something to no avail or notes a missed opportunity, parent doesn't correct behavior when it is identified during visit
1	Yes	The parent practiced a skill or behavior either with the children or for

	themselves (i.e. regulating oneself) that was new or different for them
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4. Progress towards connecting with services/self-sufficiency – What steps has the parent taken to improve the situation of the family in terms on concrete services or supports? This included connecting to services the parent is referred to by the program or other concrete supports like schools, camps, and day care centers.

99	N/A, Unknown	<ul style="list-style-type: none"> No mention of follow-up or making referral, Nothing asked of client yet
0	No progress	<ul style="list-style-type: none"> Parent refuses to make the contact with referred service Parent refuses to let team help them connect with services Parent said they are going to call but parent reports no effort was made yet
1	Progress made with Help of CF team (In progress)	<ul style="list-style-type: none"> On first discussion of service, parent reports they are interested in the services and will call/follow-through with referral Parent did not follow through in between visits, but during visit allows CF team to call or connect with the service <i>for them</i> (includes completing paper work for parent) Parent goes to a provider meeting with the team but parent does not do any of the talking/does not lead meeting Parents says they called but were not responded to or never got in touch with anyone to make an appointment
2	Progress made with support of CF team	<ul style="list-style-type: none"> The parent did not connect with the service between visits but the <i>parent</i> calls or completes necessary steps while the CF team is there There was more than one referral or suggestion and the parent followed through with some but not others CF teams goes with parent to provider meeting but <i>parent</i> does the talking or leads the meeting Some action by parent, e.g. set an appointment or got on a waitlist
3	Progress made on own	<ul style="list-style-type: none"> Follows through with referrals on their own Parent attends an appointment or meeting on own, connects with services on their own Takes proactive steps independently to access a service or support for herself or her child

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