Development Of A Naturalistic Observational Parenting Practice Assessment Tool For Externalizing Behavior Research

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DEVELOPMENT OF A NATURALISTIC OBSERVATIONAL PARENTING PRACTICE
ASSESSMENT TOOL FOR EXTERNALIZING BEHAVIOR RESEARCH

by

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Abstract

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THAILYN L. ALONSO

Advisor: Professor Miriam K. Ehrensaft, PhD

Externalizing behavior problems have severe clinical implications. In fact, they have been found to be the primary basis for mental health referrals in early childhood. Findings from research on the etiology and development of externalizing behavior problems indicate these in addition to having significant effects throughout the life span effects also extend across multiple generations. Family and child development research consistently finds that one of the most significant modifiable factors in the prevention and treatment of externalizing behavior problems in early childhood is parenting practices. Unfortunately, much of the extant literature is limited by parenting measures that are prone to recall bias, impression management, and limited ecological validity. Furthermore, ethnic minority families and families of low socioeconomic status are greatly underrepresented in the research examining the relationship between parenting practices and externalizing behavior problems as well as in the research on the development of parenting measures and research methodology to further examine this relationship.

The purpose of the current study was threefold: (1) to develop and validate a parenting coding system, the iPARENT, to assess naturally occurring parenting behavior data obtained by a novel recording device, the iEAR, in the home; (2) to identify and measure the degree of parenting practices empirically shown to increase the risk for child externalizing behavior problems in a sample of young mothers and examine how it relates to mothers’ self-report of
their own parenting stress, parenting practices, and their children’s behavior as well as observed child behavior; and (3) to assess feasibility of iEAR and iPARENT use.

An ethnically diverse sample of 89 college mothers and their one- to six-year-old children participated in the study. Mothers were recruited from a public Northeastern University via the college’s Child Care Center, flyers posted on campus, and in-person recruitment on campus. Mothers were a mean age of 24 years (SD = 2.92) and children were a mean age of 3.71 years (SD = 1.49); 57.3% of the children were male. Mothers completed self-report measures of parenting stress, parenting practices, and child behavior. Parenting practices and child behavior data were also obtained through iEAR observations and were coded according to the iPARENT coding scheme.

Results indicated that the iPARENT is a reliable measure of parenting and child behaviors. On average, mothers spent 62% of their interactions with their children delivering information; 26% delivering commands (of which 62% did not give the child an opportunity to comply); 10% delivering criticisms; and .02% delivering praise. An exploratory factor analysis with a target rotation revealed that the iPARENT consists of a three-factor structure: “Warmth,” “Harshness,” and “Ineffective demands for compliance.” Convergent validity could not be established between the iPARENT and mothers’ self-report on the Parenting Scale; however, the iPARENT demonstrated good discriminant validity. A significant relationship was found between mothers’ self-reported parenting stress and observed negative affect and praise. Mothers’ engagement and critical remarks significantly predicted concurrent child noncompliance frequency. Harshness of mothers’ criticism significantly predicted concurrent child backtalk frequency. iPARENT assessed parenting practices were not found to significantly predict mothers’ reports of child misbehavior. However, post-hoc analyses revealed that for children
ages four-years and older, iPARENT assessed noncompliance significantly predicted mothers’ reports of child behavior, suggesting that the iPARENT may be a more valid assessment tool for children at least four-years-old. Lastly, the iEAR was found to be feasible for research practices and to potentially assist with the retention of ethnic minority and low SES families in observational research. The iEAR and the iPARENT show potential in obtaining reliable and valid parenting and child behavior data of at-risk families. Further research is warranted to examine the iPARENT’s ability to discriminate between clinical and nonclinical samples. Also, further research should aim to replicate findings with other samples of ethnic minority families, fathers, and a larger sample of older children in order to generalize findings and further validate use of the iPARENT in child behavior research.
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CHAPTER ONE: INTRODUCTION

Child externalizing behavior problems are the primary basis for mental health referrals in early childhood and pose a long-term risk for the development of psychopathology and antisocial behaviors. In addition to posing a significant mental health risk for the behaviorally disordered child, externalizing behaviors also pose a societal risk, as they are likely to negatively impact others in the immediate environment. Several interventions have aimed to reduce child externalizing behavior problems and the most successful ones have been those that have targeted parenting practices that have been empirically shown to increase the risk for behavioral disorders. Although current parenting interventions have been effective for many families, there are still many others whose children’s behaviors remain resistant to treatment. Further research is necessary in order to identify new intervention targets for treatment resistant behaviors. In order to identify these targets and promote culturally sensitive programs, the research has to be sound. Unfortunately, parenting and child behavior research has been limited by issues of attrition, usually of families most in need of services, and by the data collection methods used. Much of the research in this area relies on self-report and although these measures can yield important data they are also prone to many biases, particularly in parenting research. Observational measures of parent-child interactions have been shown to provide more valuable parenting data. However, existing paradigms are expensive, may have limited generalizability outside the laboratory, and place a significant practical burden on participating families.

In the introduction of this paper, literature on the developmental trajectory of child externalizing behavior problems and its impact on the life-course is reviewed. This is followed by a review of the role of parenting on the development and treatment of externalizing behaviors and the influence of culture on parenting practices. A review of theories that address the
relationship between parenting and externalizing behaviors informs how parenting shapes children’s behaviors; and a brief review of empirically-based parenting interventions and their targets clarifies how identifying and targeting specific parenting practices can effectively reduce child externalizing behavior problems. Current methods of assessing parenting practices are reviewed. The strengths and limitations of self-report and observational measures are discussed. Lastly, a new technology, the iPod-deployed the Electronically Activated Recorder (iEAR), is introduced, along with its potential for obtaining naturalistic home observations of parent-child interactions to address gaps in extent observational parenting assessment tools.

The purpose of this study is to examine the reliability and validity of a language based coding system created to assess parent-child interaction data obtained through the iEAR. Methods for obtaining naturalistic home-based data of 84 mother and child dyads are explained. Results are reported regarding the coding system’s code scores, code relationships, reliability, validity, factor structure, and ability to predict concurrent child behavior. Findings, study strengths, study limitations, and future directions are discussed.
CHAPTER TWO: PARENTING AND CHILD EXTERNALIZING BEHAVIOR

Developmental Trajectory of Child Externalizing Behaviors

While most parents experience some degree of child misbehavior, externalizing behavior problems vary greatly from developmentally appropriate behavioral “difficulties.” Externalizing behavior problems consist of oppositional, hyperactive, aggressive and violent behaviors that a child directs towards his or her environment (Liu, 2004). Externalizing behavior problems have been found to be stable over time (Deater-Deckard, Dodge, Bates, & Pettit, 1998) and to have long-term consequences in the absence of adequate intervention. Children with elevated externalizing behavior problems have a poor prognosis and are at risk for a wide range of negative consequences (Bailey, Hill, Oesterle, & Hawkins, 2009; McFadyen-Ketchum, Bates, Dodge, & Pettit, 1996). For instance, child externalizing behaviors significantly increase the risk for juvenile and adult delinquency (Eron & Huesman, 1991; Moffitt, 1993; Patterson, Reid, & Dishion, 1992), alcoholism, drug abuse, domestic violence, child abuse, and a broad range of psychiatric disorders (Dretzke et al., 2009; Farrington, 1991; Mesman, Bongers, & Koot, 2001). According to Liu (2004), externalizing behaviors are significantly associated with the development of other more severe behavioral disorders and are thought to represent a less severe form of antisocial behaviors in young children. In fact, Moffit (1993) has shown evidence that early antisocial behaviors predict life-course persistent antisocial behavior.

Findings from several longitudinal studies have established that untreated childhood externalizing behaviors can have detrimental effects in adulthood. The Cambridge Study in Delinquent Development is a prospective longitudinal study of male children ($N = 411$) recruited from schools in London between 1961 and 1962 (Farrington, 1991). Data were obtained from
multiple informants (teacher, peer, parent, and child reports) for over 20 years while the children were between the ages of eight and 32. Research findings revealed that there was a significant continuity in aggressive behaviors such that childhood measures of aggression at ages 8-10 predicted adult aggression at age 32. Furthermore, childhood aggression was found to be a significant predictor of adult criminal violence, as measured by a combination of official records and participant self-report. Lastly, childhood aggression was also found to significantly predict adult unemployment, heavy alcohol consumption, intimate partner violence, and poor relationship quality (Farrington, 1991).

A separate longitudinal study conducted almost 20 years later obtained similar results. Using a longitudinal population-based design (N = 2,076), Reef, Diamantopoulou, Meurs, Verhults, and Ende (2011) examined the relationship between childhood trajectories of four externalizing behaviors subtypes (oppositional, aggressive, status violations, and property violations) and DSM-IV-TR disorders in adulthood. Participants were randomly selected from the general population of Zuid-Holland (i.e., South Holland) in 1983 and five waves of data were collected, spanning ages 4-16 years. Externalizing behaviors were assessed via parent interviews and parent reports on 21 externalizing behavior items of the Achenbach Child Behavior Checklist (CBCL). Participants were interviewed in 2006 and 2007 when they were 28-40 years old, at which time 67% of the original sample had been retained for follow-up. Findings corroborated Farrington’s (1991) conclusion that externalizing behavior problems in childhood do in fact persist into adulthood. In fact, all four externalizing behavior subtypes were found to predict later disruptive disorders. Compared with children displaying low levels of externalizing behavior, children displaying high levels at any time point, regardless of the course (i.e., increasing, decreasing, or persisting), were more likely to experience poor outcomes (anxiety,
mood disturbances, substance abuse/dependence and other DSM-IV-TR disorders) in adulthood.

Research informs us that children who exhibit externalizing behavior problems suffer from emotional dysregulation and a lack of adequate social skills (Han & Shaffer, 2012; Rubin, Burgess, Dwyer, & Hastings, 2003). This lack of social skills and failure to effectively cope with emotionally laden experiences, paired with the modeling of inappropriate social exchanges, substantially increases the risk of aversive behaviors that result in alienation by prosocial peers, and affiliation with deviant peers (Burt, McGue, & Iacono, 2009). Deviant peer association has been shown to foster the development of more severe antisocial behaviors (Snyder et al., 2005). This in turn leads to experiencing more unsuccessful relationships and social isolation, both of which are associated with anxiety, mood disturbances, and substance abuse/dependence disorders (Reef, Diamantopoulou, Meurs, Verhulst, & Ende, 2011).

In another study, Kokko, Pulkkinen, Huesmann, Dubow, and Boxer (2009) used two longitudinal samples to investigate the predictability of adult aggression from behaviors in middle childhood. The first sample consisted of 369 Finnish children (53% male and 47% female) recruited from second-grade classes in 12 schools; participants were drawn from the Jyväskylä, Finland Longitudinal Study (JYLS). The second sample consisted of 856 U.S. children (51% male and 49% female) that represented an almost complete population of third graders during the 1959-1960 school year in Columbia County, New York; participants were drawn from the Columbia County Longitudinal Study (CCLS). Peer and self-report aggression measures were obtained in multiple waves at ages 8, 14, 36, and 42 years (JYLS) and 8, 19, 30, and 48 years (CCLS). Results revealed that childhood and adolescent aggression together significantly predicted adult physical aggression for both Finnish and U.S. males and females. Specifically, aggression at age eight significantly predicted aggression at age 14 (JYLS) and 19 (CCLS), and
aggression in adolescence significantly predicted physical aggression in adulthood. Although the measures administered to each sample were comparable, they were not identical and were administered at different points in time with a longer lag between adolescent and adult assessments in the Finnish sample (14-36) than in the U.S. sample (19-30). Nonetheless, both samples were recruited from schools and began their assessments at age eight by answering the same aggression items. Despite the methodological limitations of this study, historical differences in when the studies were conducted, and cultural differences across samples, all three longitudinal studies concluded that aggression in childhood is a robust predictor of aggression in adulthood (Farrington, 1991; Kokko et al., 2009; Reef et al., 2011). Findings from these international studies indicate that in the past 50 years, childhood externalizing behaviors have been a prevalent and persistent problem that when left untreated, have significant long-term mental health consequences.

The negative impact of untreated childhood externalizing behaviors has been further shown to extend across multiple generations. Using a 20-year prospective longitudinal design, Brook, Lee, Finch, and Brown (2012) examined the influence of child behavior problems across three generations assessed five times. An ethnically diverse sample of children and their parents ($N = 390$) were recruited in 1990 from schools in the East Harlem area of New York City when the parents were a mean age of 32.3 years ($SD = 1.2$ years; Generation 1) and the children were a mean age of 10.5 years ($SD = 3.9$ years; Generation 2). Prospective measures of child externalizing behavior were obtained via self-report, interviews, and parent report. The second generation’s adult externalizing behavior was assessed via self-report during the third assessment when the sample was a mean age of 24.4 years ($SD = 1.3$ years) and again during the fourth assessment when the sample was a mean age of 26.1 years ($SD = 1.4$ years). Externalizing
behavior data from the second generation’s children (Generation 3) were obtained via parent report during the fifth and final assessment when parents were a mean age of 32.3 years ($SD = 1.3$ years) and their children were between ages 4-18 years. Results indicated that there was (1) a significant continuity in externalizing behaviors for participants over time, and (2) a significant continuity from participants’ own history of externalizing behaviors to their children’s. The second generation’s externalizing behaviors in adolescence were directly associated with externalizing behaviors in adulthood, which in turn were associated with the externalizing behaviors of their own children, the third generation. Also, childhood externalizing behaviors in Generations 2 and 3 were negatively related to the mutual parent–child relationship. Furthermore, parents’ externalizing behavior history was found to mediate the association between the quality of their relationship with their children and their children’s externalizing behavior problems.

As discussed by the authors, these findings are consistent with Belsky’s process model of parenting (Belsky, 1984), in that the characteristics of the child contribute to individual differences in parental functioning and vice versa. There is evidence that parental rejection and punishment of a child can be a response to the child’s aggression. A multisite longitudinal study of two cohorts (1987 and 1988) of children and their parents ($N = 562$) found that externalizing behaviors predicted the frequency of physical discipline in the next year, and more frequent physical discipline in a given year was significantly associated with more externalizing behaviors the next year (Lansford et al., 2011). The child participants in the Brook, Lee, Finch, and Brown (2012) study may have acquired their externalizing behavior problems through a combination of genetic predispositions to aggression and inadequate parenting practices that modeled and reinforced many of these dysfunctional behaviors. It is likely that a behaviorally and emotionally dysregulated parent may be employing parenting practices that contribute to and maintain the
child’s behavioral dysregulation and in turn, their own ineffective parenting practices. Furthermore, these aversive parent and child behaviors place a strain on the parent-child relationship (Brook, Finch, & Brown, 2012), leading to a poorer prognosis for both the parent and the child. In fact, there is ample evidence that increases in inadequate parenting practices lead to child behavior problems, and that the latter predict subsequent parenting stress (Bigras, LaFreniere & Dumas, 1996; Haskett, Ahern, Ward & Allaire, 2006). The association of parenting with child externalizing behavior problems is reviewed below.

**The Influence of Parenting on Externalizing Behaviors**

The aforementioned studies highlight the impact of externalizing behavior problems on the life course and shed light on the importance of the parent-child relationship in moderating the development of child externalizing behaviors. According to Maccoby (2000), parenting variables have typically accounted for 20% to 50% of the variance in child outcomes. Parenting research has found specific parenting practices to increase children’s risk for developing externalizing behavior problems (Dallaire & Wilson, 2010; Dannerbeck, 2005). Specifically, parental rejection and harsh and inconsistent punishment have been implicated in the etiology of child aggression (Eron et al., 1991). Harsh discipline, defined as spanking, threatening, yelling, or screaming in response to misbehavior, is a robust predictor of externalizing behavior problems (Bailey et al., 2009) and epidemiological studies of children have found it to account for 50% of the variance in subsequent conduct problems (Cohen & Brook, 1995). Additionally, high levels of corporal punishment and lower levels of parental warmth and responsiveness are associated with deficits in children’s self-regulation and social cognition, both of which are also implicated in externalizing disorders (Olson, Lopez-Duran, Lunkenheimer, Chang & Sameroff, 2011). Furthermore, findings from a meta-analytic study demonstrated that negative, harsh, and
uninvolved parenting was associated with increased relational aggression, while positive parenting was associated with less relational aggression (Kawabata, Alink, Tseng, van Izendoorn, & Crick, 2011).

Lax supervision is a stable predictor of juvenile conduct problems and delinquency (Hagan & Dinovitzer, 1999) and variations in parent discipline and monitoring have been found to account for 10-40% of the variance in child antisocial behavior (Eddy, Leve, & Fagot, 2001). Although boys are known to be at a higher risk for externalizing behaviors, the relationship between inept discipline and child antisocial behaviors has been found to be similar for elementary-aged males and females (Eddy, Leve, & Fagot, 2001). A cross-sectional study of a community sample of children ages 6-12 years, found that all parenting variables, as measured by parent report on the Alabama Parenting Questionnaire, were significantly related to child externalizing behaviors (Gryczkowski, Jordan, & Mercer, 2010). Parent gender moderated these effects such that mothers’ but not fathers’ disciplinary inconsistency was significantly associated with child externalizing behavior problems. It is possible that in this sample, mothers spent more time with their children and had greater opportunities for inconsistency, whereas fathers may have been called to intervene in only extreme situations during which their disciplinary style was likely to be consistent.

While dysfunctional parenting practices have been shown to increase children’s risk for developing and maintaining externalizing behavior problems, positive parenting practices have been shown to buffer against the effects of other contributing risk factors. Results from a longitudinal study by Bohman (1996) indicated that having a biological parent with a history of criminality and being adopted into a dysfunctional home increased the likelihood of becoming a petty criminal by a factor of three. Meanwhile, having a biological parent with a history of
criminality and being adopted by stable parents who provided a supportive environment buffered against these effects. Chronis et al. (2007) used a prospective longitudinal design to examine the contribution of parental psychopathology and early-observed parenting on the developmental course of conduct problems in two cohorts of young children ages 3-7 years (N = 108) with Attention-Deficit/Hyperactivity Disorder (ADHD). Parenting was assessed via observations of videotaped mother-child interactions during a structured laboratory task; interactions were coded using the Dyadic Parent-Child Interaction Coding System (DPICS; Robinson & Eyberg, 1981). Participants were recruited from referrals to child psychiatry clinics in Chicago and Pittsburgh and via flyers distributed at schools and newspaper advertisements. Children of mothers exhibiting the highest level of positive parenting practices (praise, positive affect, and positive physical touch) during an initial observation, presented with lower levels of behavioral problems in the eight subsequent years of the study when compared to the remainder of the sample.

A recent longitudinal study examined the association between mothers’ positive parenting in toddlerhood and externalizing behaviors in childhood (Boeldt et al., 2012). Participants were same-sex twin pairs (N = 942; 50% male, 50% female) born between 1984 and 1990 and recruited through the Colorado Department of Health. Positive parenting was assessed observationally via microanalytic coding and global ratings of videotaped mother-child interactions at 7, 9, 14, 24 and 36 months. Externalizing behaviors were assessed through maternal report on the CBCL at ages 4, 5, 7, 9, 10, 11 and 12 years. Higher levels of maternal positive parenting (warmth, sensitivity, quality of instruction, and overall interaction) during infancy and toddlerhood predicted lower levels of externalizing behavior during later childhood. The findings of this study are strengthened by its longitudinal design, examining the causal relationship between parenting practices and externalizing behaviors, and its observational
parenting measure, which is less likely to be affected by bias than parent self-report. These findings support previous research highlighting parenting practices as a powerful source for prevention and treatment of externalizing behavior problems among at-risk children.

In addition to buffering against contributing risk factors, positive parenting practices have been found to reduce existing child externalizing behaviors for a variety of populations. In a longitudinal study by McFadyen-Ketchum, Bates, Dodge, and Pettit (1996), mothers’ affection and positive interest was shown to decrease levels of aggression and disruptive behavior in their preschool-aged male and female children. In a separate study, a reduction in harsh maternal discipline and an increase in positive parenting fully mediated improvements in child conduct problems among a sample of Somali and Pakistani immigrant mothers living in Norway (Bjørknes, Kjøbli, Manger, & Jakobsen, 2012). Recently, Kim-Spoon, Haskett, Longo, and Nice (2012) used a prospective longitudinal design to examine the joint contributions of child self-regulation and positive parenting behaviors in the development of externalizing symptomatology of children with substantiated physical abuse reports within the past year. The sample consisted of 95 ethnically diverse four- to seven-year-old children (58% male) from economically disadvantaged families, followed from preschool through the eighth grade. Parenting practices and child externalizing symptomatology were assessed via self-reports, and by parents and teachers respectively. Results indicated that there was a significant interaction effect for self-regulation and positive parenting in regards to children’s externalizing symptomatology in the kindergarten years. Children with low levels of self-regulation were more likely to exhibit externalizing behaviors if they were also receiving inadequate parenting. Meanwhile, no relationship was found between self-regulation and externalizing symptomatology for children receiving high levels of positive parenting. During the first-grade years, the child’s ability to self-
regulate mediated the relationship between parenting practices and externalizing behaviors. It is possible that parenting practices in young childhood model self-regulation strategies for the child. A limitation of this study was that the frequency and degree of abuse was not controlled for; more severe cases could have resulted in more severe child psychopathology. It would have been useful to assess the proportion of variance accounted for by parenting practices, controlling for the severity of the experienced abuse.

In sum, extant parenting literature provides evidence for the role of specific parenting practices and their role in: (1) increasing the risk for externalizing behavior problems; (2) buffering against the effects of other contributing risk factors; and (3) reducing existing externalizing behavior problems for a variety of populations. Furthermore, no gender differences in how these parenting practices affect child behavior have been found. Research examining the influence of culture on parenting has revealed mixed findings; this literature is briefly reviewed below.

**Parenting and Culture**

While some researchers have found cultural differences to have significant effects on parenting practices, others have not. In particular, some studies have found that socioeconomic status predicts the differences in parenting practices that were once attributed to differences in ethnic background, culture, and immigrant status. A study by Shumow, Vandell, and Posner (1998) examined whether harshness, firm-responsiveness, and permissiveness had the same implications for children growing up in low-income urban families as they do in middle-class families. Findings indicated that harsh parenting, regardless of social class, was associated with teachers reporting poorer child adjustment at school and was negatively related with academic
achievement as measured by the Iowa Test of Basic Skills when the children were in the fifth grade. Firm-responsive parenting was related to lower parent-reported behavior problems in the home. Surprisingly, reports of parental permissiveness were not associated with any measure of child adjustment. On the other hand, some researchers have found that low-income urban parents tend to be harsher than middle-class parents in their child rearing (Kelley et al., 1992; Steinberg et al., 1991) and that this approach can be beneficial in environments with dangerous neighborhoods (Baumrind, 1991b). Ceballo and Hurd (2008) examined the influence of contextual factors on parenting practices among 104 Latina, European American, and African American mother-child pairs. While there were no significant differences in parenting strategies (parental efficacy, parental monitoring, parental warmth, and psychological control) between the three ethnic groups, neighborhood quality was associated with mothers’ use of psychological control.

Altschul and Less (2001) examined indicators of acculturation and nativity as predictors of maternal aggressiveness towards their children among 328 foreign-born and 517 native U.S.-born Hispanic mothers. Results indicated that foreign-born Hispanic mothers had significantly lower rates of physical aggression than native-born Hispanic mothers. This study found that the strongest risk factors predicting maternal physical aggression were: being a U.S. native; maternal alcohol use; parenting stress; and child aggressive behavior. Findings from this study suggest that immigrant status can be a unique protective factor contributing to lower levels of physical aggression among Hispanic mothers in the U.S. Lastly, a longitudinal study of 262 mothers who had participated in a randomized clinical trial of a child maltreatment prevention program examined whether risk for harsh parenting differed among mothers who identified themselves as Spanish-speaking Latinas ($n = 64$), English-speaking Latinas ($n = 102$), or non-Latina
Caucasians ($n = 96$) (Martin, Fisher, & Kim, 2012). At the time of their infants' births, Spanish-speaking Latina mothers demonstrated higher SES risk, whereas the English-speaking Latina and non-Latina Caucasian mothers demonstrated higher psychosocial risk. Three years later, English-speaking Latina and non-Latina Caucasian mothers reported harsher parenting behaviors than Spanish-speaking Latina mothers. As previously mentioned, findings from research investigating the effect of culture on parenting have been mixed. However, socioeconomic status and immigrant status have been shown to be consistent predictors of parenting harshness and child behavior outcomes. As a result, research on parenting should control for these two variables and continue to be sensitive to the influence of culture on parenting, as it is critical to our understanding of the dynamics of parenting and child socialization.

**Theories on Parenting and the Development of Child Externalizing Behaviors**

Bandura’s social learning theory (1978) emphasizes the importance of the social context in behavioral development. This theory posits that individuals acquire moral, aggressive, and antisocial behaviors through observational learning, modeling, and imitation. These behaviors are reinforced both vicariously and by others in the environment. The parent-child relationship has been viewed as one of the most influential environments for the developing child (Wilson & Durbin, 2012). Young children’s social exchanges consist almost entirely of their interactions with their parents, or other primary caregivers; thus, parental behaviors have a powerful impact on shaping young children’s behaviors. Furthermore, evidence consistently highlights the influence of coercive hostile environments on the development of self-regulation. Parents who frequently scold, threaten, and are occasionally physically abusive towards their children, unknowingly model the very aggressive behaviors that they are attempting to control (Patterson, 1986). Consequently, children who frequently observe and/or directly experience their parents’
aggression and/or involvement in coercive social exchanges are at risk for adopting similar forms of conduct and coming to believe that these are acceptable and effective behavior strategies. Furthermore, evidence consistently highlights the influence of coercive hostile environments on the development of self-regulation (e.g., Patterson, 1986; Patterson, Reid, & Dishion, 1992; Wilson & Durbin, 2012; Sheeber, Davis, & Hops, 2002).

Several decades of observational family research have established a strong relationship between harsh, abrasive, and inconsistent parental discipline, parental monitoring, and child externalizing behaviors (Patterson, 1986). Compared to parents of non-aggressive children, parents of aggressive children have been found to be more punitive and more likely to punish their children, resulting in an increase in the behaviors they are seeking to extinguish. In addition to being more likely to use ineffective disciplinary strategies in dealing with their children’s aggressive behaviors, parents of aggressive children are also more likely to inadequately monitor their children’s whereabouts, to be unskilled in negotiation and problem solving, and to rarely reinforce their children’s attempts at effective prosocial skills (Patterson, Dishion, & Bank, 1984). Wilson and Durbin (2012) describe effective parenting as being characterized by warmth and acceptance of a child, provision of structure, and encouragement of age-appropriate autonomy; and that according to socialization models, parental responsiveness, clear expectations, and contingent and appropriate discipline fosters the child’s motivation to please the parent while promoting internalization of parental expectations. In contrast, ineffective parenting practices are characterized by hostile, coercive, unpredictable, unresponsive, and neglectful parenting which negatively impacts the parent-child relationship and undermines the child’s healthy psychological development (Wilson & Durbin, 2012).
Patterson’s coercion theory (1982) proposes that children’s externalizing behaviors develop as a result of frequent harsh discipline and are maintained by mixed schedules of positive and negative reinforcement (Patterson, Dishion, & Bank, 1984; Patterson, Reid, & Dishion, 1992). Families with aggressive children tend to exhibit more aversive behaviors (i.e., yelling, throwing objects, hitting, etc.) than families without any aggressive children. These aversive behaviors are functional in reducing the aversive attacks of others (negative reinforcement) and in obtaining positive consequences such as attention and compliance (positive reinforcement) (Sheeber, Davis, & Hops, 2002).

One of the main principles of coercion theory is that externalizing behaviors are generated by a dual process in which: (1) children model the maladaptive parenting behaviors used to obtain their compliance; and (2) then are negatively reinforced when their acting out behaviors eliminate their parents’ aversive attempts to obtain said compliance. By permitting the child to control unpleasant interactions, the child’s externalizing behaviors become a social adaption in his or her immediate environment (Dishion & Patterson, 1997). Consequently, the child fails to acquire more socially appropriate skills for interacting with others and dealing with conflict. A child who has received abundant negative reinforcement for aversive behaviors and little positive reinforcement for appropriate behaviors is likely to encounter major difficulties in peer and academic settings when entering middle childhood (Eddy, Leve, & Fagot, 2001). Parents’ coercive behaviors result in their children’s significant social skill deficits (Sheeber, Davis, & Hops, 2002), leading them to be rejected by prosocial peers, experience academic failure, and have low self-esteem (Patterson, 1986). The more frequently these coercive interactions occur, the more likely the child is to become increasingly difficult to handle,
increasing the likelihood of a coercive parental response and in turn, the perpetuation of the coercive cycle.

Belsky’s (1984) process model portrays parenting as a buffered system in which parenting is directly influenced by three major determinants: (1) the personality and psychological well-being of the parent; (2) the characteristics of the child (e.g. temperament); and (3) the contextual sources of stress and support (e.g. the marital relationship and social network). The process model proposes that parents are able to adequately handle children with difficult temperaments so long as the subsystems of support or personal resources are not at risk. Unfortunately, there are many families for whom social supports are very limited and sources of stress are remarkably high. A lifetime of high stress and low social support experiences is likely to take a toll on personal resources and increase the risk for problematic parental functioning in the face of difficult child characteristics. In this model, personal psychological resources are regarded as the most influential determinant of parenting for two reasons. The first is due to its direct effect on parental functioning and the second is the role it plays in acquiring social supports and creating the contextual environment in which the parent-child relationship is embedded. For these families, parents are likely to be more reactive towards children with difficult temperaments, increasing the risk for later externalizing behavior problems. These problematic behaviors will continue to negatively impact the parenting practices of those parents with limited or no supports, preserving the coercive cycle and increasing the risk of harm for the parent and the child.

In summary, social learning theory, coercion theory, and the process model each highlight the importance of the reciprocal parent-child relationship in shaping behavior. These theories also bring to light four important intervention targets for at-risk families: the social
context of the parent-child relationship; use of specific parenting practices; the parent’s psychological well-being; and sources of support. Providing parent-management treatment to parents (with and without mental health problems) of children with difficult temperaments is likely to improve parents’ overall mental health and their ability to obtain needed sources of support in addition to preventing and treating current child externalizing behavior problems.

**Interventions That Work**

Externalizing behavior problems are the primary basis for mental health referrals in early childhood (Gilliom & Shaw, 2004; Morsbach & Prinz, 2006), but many parents either fail to seek out or are unable to access treatment for their children during crucial developmental periods when intervention is most effective. Research in this area makes note of the importance of early intervention in reducing the frequency and severity of externalizing behaviors and risk for violence by improving mental health outcomes for children and their parents. In the absence of adequate interventions, externalizing behavior problems present a societal cost: a psychological cost for others in the immediate environment of the behaviorally disordered child (i.e., as victims of bullying) and a monetary cost due to society’s numerous attempts to deal with these juvenile and adult individuals and the repercussions of their behaviors (i.e., community youth justice services, prison services, social services, psychiatric services, unemployment benefits, etc.) (Dretzke et al., 2009).

Research on parenting has established that the use of more effective disciplinary strategies reduces the rate of deviant child behavior and increases the effectiveness of parenting commands (Patterson, Dishion, & Bank, 1984). In fact, parenting practices have been found to mediate the impact of children’s temperament and other environmental variables (i.e. poverty,
parental stress, and parental psychopathology) on child adjustment (Patterson, 1997). Research findings from the parenting and the child conduct literature convey the powerful impact of parenting practices on children’s behavioral outcomes. In fact, parenting behavior has been consistently shown to be one of the most important contributors to healthy child development and well-being (Comfort, Gordon, & Naples, 2011) and as a result, parenting practices have become a primary target for preventing and reducing conduct problems (Chronis et al., 2007). Parent management training has been shown to be an effective treatment for child noncompliance (Rhule, McMahon, & Vando, 2009). The effectiveness of parent-based interventions at reducing child externalizing behavior problems demonstrates the bearing of parenting practices on child behavior. Thus, three successful evidence-based parenting interventions are reviewed: the Triple P-Positive Parenting program (Sanders, 1999); the Incredible Years program (Webster-Stratton, 2000); and Parent Child Interaction Therapy (PCIT; Chaffin et al., 2004; Nixon, Sweeney, Erickson, & Touyz, 2003).

Triple P Positive Parenting is a multilevel parenting program for the prevention of severe behavioral problems in children ages one through 16 years (Sanders, 1999). The program is based on social learning principles and aims to reduce child conduct problems by enhancing parents’ knowledge, skills, and confidence; it incorporates five levels of intervention with increasing intensity to properly cater to the needs of children and their parents. Core parenting skills include: giving descriptive praise; giving non-verbal attention; and providing children with engaging activities. The treatment is delivered through a variety of modalities including in-person, web-based, and community level television programming for parent training. Numerous randomly controlled treatment studies have found Triple P to effectively reduce child conduct problems (Sanders, Markie-Dadds, Tully, & Bor, 2000; Bor, Sanders, & Markie-Dadds, 2002;
The Incredible Years is another evidence-based parenting program with the goal of delivering comprehensive treatment programs for young children with early-onset conduct problems (Webster-Stratton, 2000). The program aims to prevent delinquency, drug abuse, and violence by decreasing negative behavior and noncompliance with parents in the home and by decreasing peer aggression and disruptive behaviors in school. The program objectives include decreasing negative attributions and increasing children’s social skills, understanding of feelings, conflict management skills, academic engagement, school readiness, and cooperation with teachers. The curriculum retrains parents to play with their children to model and reinforce prosocial behaviors, helping their children learn, monitoring their children's activities, and employing effective disciplinary approaches. Compared to untreated controls, the Incredible Years program has been found to significantly reduce clinically significant conduct problems for 75% of children receiving the treatment and results have been maintained at one-year and two-year follow-ups (Reid, Webster-Stratton, & Hammond, 2003; Webster-Stratton, 1990; Webster-Stratton & Hammond, 1997).

Parent Child Interaction Therapy (PCIT) is an evidence-based treatment program for young children with externalizing disorders. PCIT emphasizes the quality of the parent-child relationship as a precursor to improving parent-child interaction patterns. The treatment has two phases, child directed interaction (CDI) and parent directed interaction (PDI). In the first phase, the parent learns play skills similar to those used in play therapy. These skills are meant to engage the child in play and over time strengthen the parent-child relationship. During the second phase, parents learn parenting strategies that more effectively increase child compliance.
such as delivering commands, labeled praises, planned ignoring, and time-out procedures. PCIT was developed in the U.S. in 1974 and since then it has been adapted for use in Australia, Germany, Hong Kong, the Netherlands, Norway, Puerto Rico, Russia, and Taiwan (Substance Abuse and Mental Health Services Administration, 2012). PCIT reductions of child externalizing behaviors have been associated with large effect sizes (Cohen’s d = .97) (Chaffin et al., 2004; Schuhmann, Foote, Eyberg, Boggs, & Algina, 1998; Nixon, Sweeney, Erickson, & Touyz, 2003).

In summary, findings from these parenting-based interventions are encouraging; however, more rigorous research is needed in order to identify intervention targets for hard to reach families and treatment resistant child behaviors. While parenting research has come a long way, many studies have been limited by their outcome measures. An improvement in the quality of the measures used to assess parenting practices and other parent-child interactions is crucial in extending this research. These limitations are addressed presently.
CHAPTER THREE: ASSESSMENT OF PARENTING PRACTICES

Parenting Measures

The assessment of parenting practices is an essential component for providing relevant services to young children and their families and has important implications for the study of clinical child and family psychology. To treat externalizing behavior problems, parent behavior must first be validly and reliably assessed. Research on parenting currently employs two main types of parental measures, self-reports and observations. Due to the complexity of the parenting construct, a variety of parenting self-report measures have been created with many focusing on different aspects of the construct (e.g., attitudes, style, satisfaction, competence, self-efficacy, stress, skills, and specific types of behaviors).

Self-reports are prevalent in parenting research and are renowned for their administration and scoring ease (Wilson & Durbin, 2012), at least in comparison to the more laborious observational methods. According to Zaslow et al. (2006), maternal reports, the most common types of parental self-report, take into account parenting across different times and contexts. This is advantageous because it considers more interactions than most other techniques. Additionally, research assistants with little to no training can quickly and easily administer self-reports. Furthermore, parenting self-reports can also be used to assess low-frequency private events (Wilson & Durbin, 2012) that would otherwise not be disclosed to researchers.

Although self-report measures provide a rich source of information they have also been found to have several limitations and have not always been the most reliable means of data collection (Stone, Turkkan, Bachrach, Jobe, Kurtzman, & Cain, 2000). Specifically, self-reports are prone to recall bias and systematic distortions (Morsbach & Prinz, 2006; Stone & Shiffman,
In parenting research, self-reports commonly involve parents reporting on the frequency of specific behaviors (their children’s and their own); this type of self-report is likely to be subject to memory biases. Studies examining the reliance of individuals’ autobiographical memory indicate that individuals are typically not very accurate in recalling past events, even those events occurring just a few hours before recall (Mehl, Pennebaker, Crow, Dabbs, & Price, 2001). Increases in cognitive load have also been associated with decreased accuracy of self-reports resulting from respondents using less precise estimation strategies when responding to items (Morsbach & Prinz, 2006). Parents may also place a disproportionate amount of emphasis on recent or personally salient events (Zaslow et al., 2006). In addition, many factors can bias an individual’s ability to recall past events at all stages of human information processing, including the salience of an event, an individual’s implicit theories of stability and change, evaluation of the current situation, and emotional state during the encoding and retrieval of information (Mehl et al., 2001).

Even minor changes in question wording, format, or order can affect the way in which an individual chooses to respond to an item (Schwarz & Oyserman, 2001). The degree of consensus in the general population about definitions and interpretations of certain parenting-related terms (i.e., time-out) is unknown (Morsbach & Prinz, 2006). Also, many parents may react to items that they consider to be sensitive in nature. Tourangeau, Rips, and Rasinski (2000) identified three dimensions of sensitivity: social desirability; intrusiveness; and risk of disclosure to third parties. Parents may be hesitant to endorse items that they believe would portray them as substandard parents. Zaslow et al. (2006) comments that maternal report is limited by the fact that mothers may choose to portray themselves and their relationships with their children in a more favorable light. It is not uncommon for parents to over- or under-report certain parenting
behaviors in order to manage their impression—an issue of social desirability. According to Furnham (1986), social desirability is a stable multidimensional trait, not just a situation-specific response. Parent self-reports often assess parents’ analysis of the general features of their parenting and are subject to social desirability biases (Wilson & Durbin, 2012). Another reason why parents may choose to not be entirely candid is because of fear of legal reprisals; this is especially true when working with special populations (i.e., economically disadvantaged, undocumented individuals, etc.) and when assessing disciplinary practices.

Lastly, method effects can arise from the choice of measurement technique or from the choice of informant producing two potential sources of construct invalidity (Campbell & Fiske, 1959; Fiske, 1987 as cited in Zaslow et al., 2006): (a) measurement procedures can create systematic biases in the data; and/or (b) informants might not effectively report on the full range of behaviors for a variety of reasons. They may lack insight into some of their own behaviors and therefore be unable to report them. Children’s reports on parenting have been found to be as valid as direct observation measures; however, the youngest age for which these reports have been validated is for age six (Smith, 2011). This means that for children from birth to age six, observation remains the best measure of parenting. Considering the importance of parenting practices for children’s well-being, reliable and valid assessment of parenting practices has important implications.

Observational measures can address many of these issues by having objective raters obtain parenting data (Locke & Prinz, 2002). This method has an advantage over traditional self-report because what parents report they do may vary quite a bit from their actual day-to-day behaviors (Smith, 2011). Observational assessment offers an independent means to assess what parents actually do, rather than what they report they do. In fact, systematic observations have
been recommended as a strategy to improve the validity of parental constructs (Morsbach & Prinz, 2006).

Observations can be either naturalistic or structured; both assess the frequency and intensity of a wide range of observable behaviors. Home observations are better suited for investigations of parent socialization whereas more structured observations may be better suited for observing pathological family processes (Kerig, 2001). Naturalistic observations are more passive; the parent and the child are typically encouraged to go about their usual business in a context that is of relevance to them, usually their home. Researchers typically passively record behaviors as they naturally occur. Home observations have the advantage of drawing on naturally occurring behavior in a relevant context (Jacobs, Tennenbaum, Bargiel, & Seilhammer, 1995; Kerig, 2001) but unfortunately, they may be more difficult to assess for inter-rater reliability (Zaslow et al., 2006). There is also concern with the potential that being observed changes behavior; and that the behavior being observed might not be the kind of behavior a researcher is looking to observe.

Structured observations consist of the parent and the child engaging in task-oriented activities structured and observed by the researcher and his/her research assistants. This type of observation usually occurs in a laboratory where the parent and the child are typically recorded/observed through a one-way mirror and their behaviors are coded by highly trained raters. The strength of a structured observation is that it provides a standard context on which all families can be compared; families complete the same activities, eliminating differences that may be due to chance (Zaslow et al., 2006), and inter-rater reliability can be more readily established for structured observations. The challenges families experience in response to the structured observational tasks allows for the observation of parenting qualities that might not be
observed during lengthy naturalistic observations. While laboratory observations provide valuable information, their ecological validity is limited (Barkley, 1991). Additionally, behaviors that are elicited in a structured observation may not be the same behaviors exhibited in day-to-day interactions (Kerig, 2001; Zaslow et al., 2006). Also, finding the time to go to the laboratory with one’s child might prove difficult for many parents.

Concordance between parental self-report and observational measures of parenting can be especially difficult to interpret, because many observational and self-report items do not measure the same behaviors (Morsbach & Prinz, 2006) and self-report typically encompasses a wider reference period (e.g., 1 month, 3 months) than an observation (e.g., 30 min). According to Fiske (1987), discrepancies between self-reports and observations arise because self-reports are a stimulus through which particular memories are cued. These memories produce individual interpretations and impressions of events that may still have predictive value. Self-reports and observations provide somewhat different perspectives on parenting behavior and together may offer a more complete understanding of parenting (Zaslow et al., 2006). Morsbach and Prinz (2006) comment that observation provides a unique and important source of data on parenting that is best utilized in conjunction with self-report or other methods. Combining the assessment of parent knowledge or attitudes with observed parent behavior provides a more complete picture with which to target prevention and intervention services for families (Wilson & Durbin, 2012). The use of either multiple informants or methods to measure the same construct is a strategy that can maximize measurement accuracy when individual measures are sufficiently valid and reliable. Additionally, combining several sound measurement approaches can capture a broader proportion of construct variance (Zaslow et al., 2006).
Modifications in parenting assessments have paralleled the evolution of parenting theories over the past 50 years (Smith, 2011) and in the twenty-first century, parenting research has focused on the bidirectionality of the parenting relationship. Even though parenting is a dynamic process, which may be best assessed observationally, parenting research continues to heavily rely on only self-report data because of its convenience. Many observational coding systems have been developed with the hope of obtaining more accurate and ecologically valid parenting data. Specific coding systems have been created to assess the parenting practices of parents of children exhibiting externalizing behavior problems. These kinds of coding systems have proven to be useful in identifying the maladaptive parenting behaviors that should be targeted for intervention. A few of the most established coding systems include: (1) the Behavior Coding Scheme (BCS; Conduct Problems Prevention Research Group, 1999); (2) the Dyadic Parent-Child Interaction Coding System (DPICS; Eyberg, Nelson, Duke, & Boggs, 2005); (3) the Relationship Process Code (RPC; Dishion et al., 2002 as cited in Aspland and Gardner, 2003); and (4) the Parenting Clinical Observation Schedule (P-COS; Hill, Maskowitz, Danis, & Wakschlag, 2008). These are reviewed presently with a summary on existing gaps and limitations in current knowledge.

The Behavior Coding Scheme (BCS) is a clinically focused observational measure that emphasizes the importance of both problematic discipline and responsive parenting (Hill, Maskowitz, Danis, & Wakschlag, 2008). It can be used in a clinic or in a client/participant’s home. It codes frequencies of parent and child behaviors occurring during 30-second intervals and pays special attention to parents’ responses to specific child behaviors. The original BCS version, developed by Forehand and McMahon in 1981, consists of 10 parent and child behavior codes. An adapted version was created for use in the Fast Track (Families and Schools Together)
program (Aspland & Gardner, 2003; Conduct Problems Prevention Research Group, 1999). In the adapted version, parenting categories were combined into (1) command, (2) positive attention, and (3) negative attention. When used in the clinic, parents and children are each instructed to lead play tasks that last a total of approximately 10 minutes. When used for home observations, the tasks are semi-structured and the entire observation period lasts approximately 40 minutes (Aspland & Gardner, 2003). The original version of the BCS has shown acceptable inter-observer agreement (over 70%) and has been found to be a useful measure of change in interventions aiming to reduce childhood conduct problems. Lastly, the BCS has also been found to discriminate between normal and clinical populations (Forehand et al., 1975; McMahon & Forehand, 1984).

The Dyadic Parent-Child Interaction Scale (DPICS) is a comprehensive and clinically practical coding system that was originally developed by Robinson and Eyberg (1981) for the assessment of parents and young children with conduct problems. The parenting behaviors in the original DPICS were adapted from existing coding systems and most of the child behaviors were selected from the empirically–based literature (Robinson & Eyberg, 1981). Since then, the DPICS has been revised to form the DPICS-II, and more recently, the DPICS-R, comprised of 28 parent and child behavior categories for which, like the BCS, frequency counts are obtained. These are: acknowledgement; informational/behavioral description; reflective statement; descriptive/reflective question; information question; unlabeled/labeled/contingent praise; indirect/direct command; criticism; smart/play talk; laugh; whine; physical positive/negative; compliance and non-compliance; no opportunity for compliance; no answer and no opportunity for answer; warning; and time-out (Aspland & Gardner, 2003). When used in the clinic, parents and children are each instructed to lead five-minute laboratory play tasks and to collaborate on a
tidy up task; when used in the home, free play is observed. The DPICS has demonstrated high levels of inter-observer reliability (over 90%) for both parent and child behaviors (Robinson & Eyberg, 1981). A modified version of the coding scheme, used by Webster-Stratton in home and clinic observations of several randomized controlled trials, has demonstrated that the DPICS is sensitive to changes following parent training interventions and discriminates between normal and clinical populations (Bessmer, Brestan, & Eyberg, 2009; Webster-Stratton, 1990; Webster-Stratton & Lindsay, 1999), and is associated with self-report measures of parenting behaviors and parenting stress (e.g., Eisenstadt, Eyberg, McNeil, Newcomb, & Funderburk, 1993).

Both the BCS and the DPICS provide precise counts of behaviors demonstrated by the parent and the child and while this is informative, behavioral counts may not have the same clinical utility as global properties of behavior (Haynes, 2001; Mash & Foster, 2001). Global assessments of parenting that are informed by behavior counts are more clinically informative and provide a more holistic view of parental functioning for researchers and clinicians. Additionally, the time and associated personnel costs required to master the BCS and DPICS coding systems are intensive: 20-25 hours for the BCS (Frick & McMahon, 2008) and a minimum of 30 hours for the DPICS (Ridgeway, 2008). Time intensive training and coding procedures render unfeasible many empirically validated coding systems that could provide clinically useful data.

The Relationship Process Code (RPC; Dishion et al., 2002) is a brief coding system based on the Family Process Code developed by Patterson and colleagues in Oregon (Dishion et al., 1983) and has been condensed to include a much smaller number of codes. These include: positive and negative verbal; structuring; compliance and non-compliance; and positive and negative physical interactions. The RPC has time sampling and event duration coding
capabilities. The time sampling protocol can be used with videotaped parent-child interactions, using 15-second coding intervals (Aspland & Gardner, 2003). According to Aspland and Gardner (2003), the new RPC coders can be trained in approximately 30 hours to reliably use the system. Like the BCS and DPICS coding systems, the RPC training is time intensive; however, the RPC consists of fewer codes and contributes event duration coding, not available with the BCS or DPICS. Although extensive data on the validity of the Family Process Code exists, the condensed RPC version is much newer and psychometric data is not readily available. More research on this abridged coding system is needed to ensure its quality.

The Parenting Clinical Observation Schedule (P-COS) is part of a larger observational schedule, the Disruptive Behavior Diagnostic Observation Schedule (DB-DOS); it focuses on capturing key dimensions of competent and problematic parenting to directly inform clinical decision making with parents of young children with disruptive behaviors. The P-COS assesses parenting in three domains: responsive involvement, constructive discipline, and problematic discipline and results in global judgments from integrating qualitative and quantitative features of parenting behaviors. The P-COS yields three parental competence domains: responsive involvement (parental engagement with child and provision of positive verbal and behavioral feedback); constructive discipline; and problematic discipline. The P-COS has been found to have adequate internal consistency and excellent inter-rater reliability for the three domain scores, ranging from .82 for constructive discipline to .96 for problematic discipline (Hill, Maskowitz, Danis, & Wakschlag, 2008). The creators of the P-COS aimed to create a clinically useful observational coding system to address the time-costly issues of other observational coding systems. While the P-COS is briefer, initial coding procedures took an average of one hour, which may still not be feasible for clinical utility (Hill, Maskowitz, Danis, & Wakschlag, 2008).
Additionally, the P-COS has only been validated on a low socioeconomic sample of clinically referred African American families. More research with different samples is needed before the P-COS can be used to assess families of different backgrounds.

A further critical limitation to existing observational assessments involves difficulty in bringing participants into the laboratory. Many researchers experience difficulty with recruiting and retaining participants for studies that require that they travel to the laboratory with their child for observation. In fact, many studies find that 40-60% of families of children terminate treatment studies early, even if it is against the advice of their treatment providers (Kazdin & Wassell, 1998; Werba, Eyberg, Boggs, & Algina, 2006). Many families, especially low-income and at-risk families, struggle with finding the time and means to get to the laboratory with their child and obtaining childcare for siblings. Families of children experiencing more severe externalizing behavior problems (Webster-Stratton, 1997) and socioeconomic disadvantage (Armbruster & Kazdin, 1994) are at an especially high risk for attrition. Consequently, many parenting studies have experienced difficulty recruiting and maintaining minority families and families of low socioeconomic status. Several researchers have attempted to deal with this issue by bringing the observation into participants’ homes; however, this method can be intrusive and may affect participants’ behaviors.

In summary, observational assessment of parenting appears to show significant advantages over self-reports. Research seems to strongly suggest that observational assessment is well worth the extra cost (time requirement, training requirement, level of expertise, and financial costs) (Zaslow et al., 2006). However, existing methods have significant limitations, including engagement and maintenance of participants, especially disadvantaged minority families. Other methods of assessing these hard to reach families are greatly needed to facilitate
their participation in rigorous parenting research. Their participation is necessary for the creation of tailored interventions that are effective at preventing and reducing childhood externalizing behavior problems.

**The Electronically Activated Recorder (EAR)**

The electronically activated recorder is a relatively new device that is specifically designed for sampling behavioral data in naturalistic settings (Mehl & Pennebaker, 2003). It can be programmed to record brief snippets of ambient sound at a variety of intervals for up to four days (Mehl, 2006). In tracking moment-to-moment ambient sounds, the EAR yields acoustic logs of people’s days as they naturally unfold. By sampling only brief snippets of sounds instead of continuous recordings, the EAR makes large-scale nomothetic naturalistic observational studies possible (Mehl, Vazire, Ramirez-Esparza, Slatcher & Pennebaker, 2007). Participants are asked to wear the device by attaching it to their belt or carrying it in a purse-like bag while going about their daily routine (Mehl & Holleran, 2007). Psychometric findings have shown that the EAR accurately and reliably reflects individuals’ natural social linguistic and psychological lives (Mehl, Pennebaker, Crow, Dabbs, & Price, 2001).

Mehl and Pennebaker (2003) conducted a study to identify the degree of stability across time and situations in EAR data obtained from 52 undergraduate students. The goal was to track participants’ social lives from an unobtrusive observer’s point of view and to identify the degree of stability across time and situations. Participants were tracked across two, two-day periods at the beginning and end of a four-week period. The EAR was programmed to record 30-second snippets of ambient sounds every 12 minutes of the participants’ waking hours. Both degree of cross-context consistency and between speaker synchrony in language use were assessed. Results
indicated that students’ everyday language was highly consistent across time and context. This suggests that observations conducted over shorter periods of time are likely to yield valuable information that is representative of participants’ true behaviors. Additionally, participants reported that they did not experience the EAR to be particularly distracting or to have a significant impact on their social behaviors, indicating that the EAR is probably less obtrusive than the presence of a research assistant. All participants returned the EAR and reported a high degree of commitment to wearing it. Findings from this study concluded that the EAR demonstrates good convergent validity with traditional methods for studying naturalistic social life and offers unique potentials for assessing subtle aspects of people’s social interactions that normally go unnoticed.

There have been several generations of the EAR device. Initially, the EAR was developed as an analog recording system using a generic microcassette recorder that was triggered by a controller chip (Mehl et al., 2001). This model was later replaced in 2001 by a system with a digital voice recorder (Mehl, Gosling, & Pennebaker, 2006). In 2005, a third software-based system emerged that now runs on commercial PDAs (i.e., iPod). Currently, there is a free EAR application for smartphones, the iEAR, which can be directly downloaded onto any iPhone or iPod. Participants are asked to wear the lightweight and portable recording device for a number of predetermined hours (Mehl, Gosling, & Pennebaker, 2006). The iEAR has been extensively pilot-tested and has been shown to run with high reliability (Mehl, Gosling, & Pennebaker, 2006).

Mehl and Pennebaker (2003) examined the degree of EAR obtrusiveness and compliance in participants’ daily lives. Analyses were based on two archival data sets that were collected between 2001 and 2002. The aim of the study was to examine how EAR obtrusiveness and
compliance changed over the course of a short-term (48 hour) versus a long-term (10–11 days) monitoring. On average, participants in the short-term group habituated quickly to wearing the EAR. They spent 8% of the first hour talking about the EAR but this number dropped steeply and remained below 2% for the remainder of short term monitoring. For participants in the longer-term group, the method was mentioned in about 5% of their daily interactions. This percentage dropped below 2% during the second half of the monitoring. Immediately after receiving the EAR, participants went through a brief period of heightened self-awareness in which conversations about the EAR were frequent; however, most participants habituated to the method and rarely mentioned it after two hours of wearing the device. This habituation effect was found for both the short-term (48 hour) and the long-term (10–11-day) monitoring.

Language samples and ambient sounds obtained by the EAR can be transcribed and reliably coded using a variety of analyses (Mehl et al., 2001). One of these is the Linguistic Inquiry and Word Count (LIWC); a computer text analysis program that can calculate the percentage of words within each text sample and classify them along more than 70 linguistic dimensions (e.g., positive/negative emotion words, self-references, etc.) (Pennebaker, Francis, & Booth, 2001). Additionally, Mehl and Pennebaker (2003) developed the Social Environment Coding of Sound Inventory (SECSI), a coding system for use with the EAR that was created to capture basic aspects of participants’ moment-to-moment social behaviors, environments, and interactions. The SECSI is comprised of four categories: (1) location (e.g., home, in-transit, shopping, etc.), (2) activity (e.g., eating, watching television, etc.), (3) interaction (e.g. alone, talking on the phone, in the company of others, etc.), and (4) mood (e.g. laughing, crying, sighing, screaming, etc.). The coded behaviors and sounds can then be converted into time use estimates by calculating the percentage of a participant’s coded behavior within the total EAR
recording time and verbatim transcripts can be submitted to quantitative text analysis (Mehl, 2005). The behavioral coding approach results in objective and naturally meaningful data (e.g., percentage of time talking, laughing, watching TV, etc.) (Mehl & Holleran, 2007).

Ambulatory assessment methods (AAM) were developed to bypass the methodological limitations of traditional self-report by prompting participants to answer items throughout the day (Mehl & Holleran, 2007). While AAMs have the ability to assess a range of data in individual daily interactions, they are still subject to desirability bias and other biases associated with self-report. Specifically, both retrospective and momentary self-reports are subject to two important constraints: a subjective construal in recalled events and the ability to recall only what is in one’s conscious awareness (Mehl, 2006). The EAR addresses these concerns by objectively recording participant behavioral data (Mehl & Holleran, 2007). This EAR method has been of particular interest for researchers in the field of communication and language use and within the past few years, the EAR has also been adapted for use in a number of research areas in psychology. These are described below.

Mehl (2006) examined laypersons’ ability to assess subclinical depression on the basis of behavioral data obtained from the EAR. Ninety-six undergraduate research participants wore the EAR for two consecutive days and completed the Beck Depression Inventory. A second group of 18 research assistants served as naive judges of the first group’s levels of depression, with each of the first participants being rated by an average of six research assistants. Research assistants listened to the EAR recordings and rated the first group of participants on a number of characteristics including depression. Results indicated that laypersons were accurate at discriminating among moderately and severely depressed participants just by listening to their acoustic data. Participants reported using cues present at high levels of subclinical depression.
(spending time alone, not socializing, not laughing, and using anger words) to make their assessments. The fact that laypersons could distinguish moderately and severely depressed individuals exclusively by listening to acoustic data obtained by the EAR suggests that trained researchers could use the EAR to examine more subtle aspects of depression as well as other psychological behaviors and constructs.

In another study, Ramirez-Esparza, Mehl, Alvarez-Bermudez, and Pennebaker (2009) employed the EAR to examine cultural differences between Mexican and American participants. Self-report measures of sociability consisted of extraversion items of the Big Five Inventory (BFI) in English and Spanish (talkativeness, extraversion, etc.). Observational assessment of sociability focused on time spent with other people, speaking to other people, and being in public places (i.e., bars, restaurants, etc.). Results indicated that although Mexican participants reported being less sociable than Americans on self-report measures, they behaved significantly more sociably than Americans did in their daily lives. It is possible that subjective interpretations of sociability varied with culture and were responsible for this inconsistency. It is also possible that the EAR provides a unique measure of culture and culturally relevant variables that self-report may not be sensitive enough to pick up on. Inconsistencies could have also been due to test format, translation of items, etc. Regardless, the discrepancy between Mexican participants’ self-reported and observed sociability highlights the importance of employing observational measures. However, the EAR should not be construed as a substitute for self-reports, but rather as a complement to traditional assessment tools in the behavioral sciences (Mehl, Pennebaker, Crow, Dabbs, & Price, 2001).

The development of the EAR, particularly the iEAR, presents a unique opportunity for obtaining naturalistic observations of parent and child behaviors. In one study of parents and
their preschool-aged children, data obtained from the iEAR was coded with a version of the Social Environment Coding of Sound Inventory (SECSI; Mehl & Pennebaker, 2003) adapted for problem child behaviors and intercoder reliabilities were found to be very good (ICC = .92) across behaviors (Slatcher & Trentacosta, 2011). This is the only parent and child study employing the EAR as a measure and to date, no published studies have used the EAR to assess parenting practices in a naturalistic context. This method could prove to be critical in obtaining home-based observations without the intrusiveness of having a research assistant present. While some facets may not be able to be assessed due to the acoustic nature of the data derived from the EAR, it is possible that a reduction in intrusiveness and the opportunity for participants to take the device home, instead of having to travel to the laboratory with their child, may increase research participation for difficult to reach and at-risk populations. It is of utmost importance that researchers develop assessment methods that facilitate the participation of hard-to-reach families. Without their participation in methodologically rigorous parenting research, the creation of appropriate interventions that effectively target their children’s externalizing behavior problems is not possible.

The development of the electronically activated recorder (EAR) enables unobtrusive and naturalistic observations of parent-child interactions. Research studies have established the effective use of the EAR; however, one drawback is that there currently is no coding system available for assessing parenting practices acoustically. This device warrants research to examine its potential as an observational measure in parenting and family research. Researchers should focus on developing a parenting coding system for use with the EAR that can facilitate participation in otherwise time-consuming studies of parenting and family processes for many families and may prove to be especially useful for at-risk families. Lastly, EAR-based measures
of parenting and family processes may yield data from an entirely new perspective that may open doors for theory expansion and highly effective intervention adaptations.

To date, no studies have assessed parenting practices in a naturalistic setting or examined the use of the iEAR as a tool for the observational assessment of parenting and child behavior. In light of the limitations presented by current assessment methods, both observational and self-report, and the impact of targeting parenting as an intervention for child conduct problems, research investigating the use of new parenting assessment methods is warranted. This novel approach to assessing parenting may provide a new measurement tool to assess the parenting practices of an ethnically diverse group of young mothers. This innovative assessment could also potentially be used to further examine or monitor parenting in a variety of populations in research and clinical practice. The iPARENT would be the first parent behavior observational assessment tool in which the observed parties are not under the direct observation of another individual in an artificial, structured interaction task, thereby potentially reducing change in behavior of those being observed. It would also be the first observational assessment to use a significantly longer and thus more representative observation period, as typical observational tasks last only five to 15 minutes each. Improving our understanding of parenting practices in day-to-day practice may provide important advances in its assessment and treatment. This study thus has the potential to extend existing self-report and observational measurement of parenting practices and parent-child interactions.
CHAPTER FOUR: STUDY OVERVIEW

The vast body of literature on parenting and child development provides a rich resource for generating items to assess parenting practices through means of EAR observations. Findings from rigorous longitudinal research studies have consistently found that inept parental discipline (Eron et al., 1991; Patterson et al., 1993) is a robust predictor of child externalizing behavior problems. Lax, harsh, and coercive parenting practices are linked to child externalizing behavior development and maintenance; and low levels of parental warmth and responsiveness have been found to be associated with deficits in children’s self-regulation (Olson, Lopez-Duran, Lunkenheimer, Chang & Sameroff, 2011). Specifically, parents’ critical statements (Webster-Stratton, 1996), non-responsiveness (Rothbaum & Weisz 1994; Shaw et al., 1994), insensitive, unsupportive, inconsistent (Blatt-Eisengart, Drabick, Monahan, & Steinberg, 2009; Eron et al., 1991), hostile, negative (Gordis, Margolin, & John, 2001; Scaramella et al., 1999; Webster-Stratton, 1996), and coercive behaviors (Eddy et al., 2001; Fagot & Leve, 1998; Kim, Hetherington, & Reiss, 1999) contribute to the development of these maladaptive child behaviors. Parents’ warmth, positive affect, responsiveness, and praise-giving decrease the risk for child externalizing behaviors for at-risk children (Chronis et al., 2007; Kerr, Lopez, Olson, & Sameroff, 2004).

The proposed research study examines the reliability and validity of a new coding system in assessing parenting practices during a naturalistic home observation. The observation relies on the smartphone application version of the Electronically Activated Recorder (iEAR). The study aimed to: (1) develop and validate a coding system to observationally assess naturally occurring parenting behavior obtained with the iEAR, building on empirically established coding systems for observational assessment of parenting; (2) identify and measure parenting practices
empirically shown to increase the risk for child externalizing behavior problems present in a sample of young mothers; and (3) examine the feasibility of using the iEAR and the proposed coding system to assess parenting. Specifically, we examined whether the iEAR results in improved recruitment and retention of hard-to-reach populations (i.e., low income, minority, single parents, barriers to transportation, high levels of stress) in relation to other observational systems.

The following hypotheses were advanced:

(1) The proposed observational coding system, the iPARENT, would reliably assess iEAR obtained parenting behavior data, as evidenced by a generalizability coefficient that was greater than or equal to .70 (Cronbach, Gleser, Nanda, & Rajaratnam, 1972).

(2) The iPARENT was expected to generate a five-factor solution with factors related to Parental Warmth, Harshness, Leniency, Child Deviance, and Neutral Talk. The iPARENT engagement (parent and child), praise, parent positive affect, and child positive affect codes are expected to load onto a Parental Warmth factor. The iPARENT parent negative affect and negative talk codes are expected to load onto a Harshness factor. The iPARENT commands, coaxing, and lenience codes are expected to load onto a Leniency factor. The iPARENT noncompliance, backtalk, and cry/whine/yell codes are expected to load onto a Child Deviance factor. And lastly, the iPARENT neutral talk code is expected to load onto its own factor.

(3) iPARENT assessment of iEAR parenting behavior data will demonstrate convergent validity with standardized reliable and valid self-report measure of parenting practices (Parenting Scale; Arnold, O’Leary, Wolff, & Acker, 1993) and child externalizing behaviors (Eyberg Child Behavior Index; Robinson, Eyberg, & Ross, 1980). Specifically: (a) iPARENT parent negative
affect, and negative talk codes will load onto the same factor as the Parenting Scale’s Overreactivity items; (b) iPARENT commands, coaxing, and lenience codes will load onto the same factor as the Parenting Scale’s Laxness items; and lastly (c) iPARENT noncompliance, backtalk, and cry/whine/yell codes will be correlated with Eyberg Child Behavior Index scores of disruptive behavior at a value of .30 or greater.

(4) iPARENT assessment of iEAR parenting behavior data will demonstrate discriminant validity with construct-irrelevant parenting behavior (iPARENT neutral talk score).

(5) Self-reported parenting stress on the Parenting Stress Index will be correlated with iPARENT scores of parent negative affect, negative talk, harshness, coaxing, and lenience at a value of .30 or greater; and correlated at a value of -.30 or lesser with iPARENT parent positive affect and praise scores.

(6) The interaction of engagement and negative talk iPARENT scores will predict concurrent child externalizing behavior scores as assessed by iPARENT noncompliance, backtalk, and cry/whine/yell scores and Eyberg Child Behavior Index disruptive behavior scores.

(7) The iPARENT will prove to be feasible for research use. That is, attrition is expected to be less than or equal to 30% before completing the observation period, and less than 20% of the samples will be uncodable (due to failure to wear the device, unclear recordings, and participant deleted files).
CHAPTER FIVE: METHODS

Participants

The data used for this study are from a two-part research project. A total of 107 mothers and their two-month-old to six-year-old children were recruited from a large, urban, Northeastern public university’s undergraduate student population. The first part of the research project recruited a sample of 59 undergraduate mothers (Group I) to pilot test the smartphone application version of the Electronically Activated Recorder (iEAR; Mehl, Pennebaker, Crow, Dabbs, & Price, 2001) and other web-deployed self-report assessments. Group I participants were recruited during the spring and summer of 2012. The second part of the research project recruited 48 undergraduate mothers (Group II) to examine the feasibility and effectiveness of an eight-week web-based parenting intervention for mothers and their two- to six-year-old children. Group II mothers were recruited between the fall of 2012 and the summer of 2013. Five Group I participants had children younger than the age of one year. Because this study relied on the use of language to code parent and child interactions, mothers with children age one or younger (n = 5) were excluded from the study. Additionally, eight Group II participants participated in both the pilot and intervention studies. Only the baseline data for these eight participants was included in the study in order to ensure that all mothers had equal experiences with the iEAR device. This resulted in 94 cases; 54 cases from Group I and 40 cases from Group II.

For both portions of the research project, mothers from the university’s children’s center received information about the study via a letter sent home with their child, as well as by emails distributed by the university’s child care center. Mothers who did not have their child enrolled in the child care center but were a part of the university’s undergraduate student body were invited
to participate in the study via: (1) a campus wide email; (2) flyers posted on campus billboards, administrative offices (i.e., Office of Student Affairs, Academic Advising, Registrar, etc.), and college centers (i.e., Women’s Center, Counseling Center, etc.); and (3) in-person recruitment at various locations throughout the college, conducted by trained undergraduate and graduate research assistants.

Eligibility criteria for both parts of the study included: (1) being enrolled as an undergraduate student; (2) being 24 years old or younger at the time of their first child’s birth; (3) having a child at or under the age of six at the time of the study; and (4) living with their child at least 50% of the time. Two additional eligibility requirements were stipulated for mothers in Group II. Children had to be within the ages of two to six years and only mothers receiving a total stress score of 70 or above on a measure of parenting stress, the Parenting Stress Index-Short Form (PSI-SF; Abidin, 1986), were invited to participate in the second part of the study. The rationale for this was that the intervention was expected to be most beneficial for mothers of children in this age group and experiencing above average levels of stress. Additionally, parenting interventions have been found to be most effective in parents of young children (Frick, Christian, & Wootton, 1999; Kazdin, 1997).

Procedures

Research project part I (Group I). Group I participants (n = 54) completed a one-time assessment which consisted of a four-hour home audio recording, obtained by the iEAR, and an online survey that assessed educational attainment, aspirations, self-reported parenting practices, parenting stress, child behavior, relationship quality, and maternal distress. Prior to commencing the study, mothers were scheduled for a consent and assent meeting in which eligibility criteria were reviewed, consent was obtained, and the iEAR recording was scheduled to begin remotely.
at an agreed upon date and time. All iEARs were scheduled to begin recording around
dinnertime and end around the child’s bedtime, usually 5:00 p.m. to 9:00 p.m. However, the start
time of the recordings varied slightly with mothers’ schedules. For example, some of the mothers’
work schedules prohibited an earlier start time so they started the recording later; some mothers
purposefully kept their children up a little later so that they could spend some time with them
after work. All iEAR recordings were programmed to record for an alternating two minutes on
and 10 seconds off. At the time of the consent, research assistants provided each mother with the
iEAR device and a link to the online survey. Mothers were offered the opportunity to complete
the survey in the lab; however, almost all mothers opted to complete it at home. Prior to the
scheduled recording, mothers received a reminder text message or phone call to wear the device.
At the end of each recording, mothers received a follow-up call from a research assistant. The
purpose of this call was to obtain the most accurate information from participants regarding the
presence of any other individuals as well as the mother and the child’s activities during the
recording period. Mothers were also asked if the child was asleep during any portion of the
observation and if they ever took off or forgot to wear the iEAR. This was meant to assist
research assistants when transcribing and coding audio files. All mothers received $50 for their
participation after completion of both the iEAR recording and the online survey.

All mothers were randomly assigned a six-digit identifying number used to identify
participants within the database. The key containing the names of mothers and their identifying
number was kept separately from the database in a locked filing cabinet, and was only available
to members of the research team. Lastly, all participants were granted a period of 30 days to
review and delete any audio samples obtained by the iEAR that they did not feel comfortable
sharing with the research team. Therefore, members of the research team did not listen to any
iEAR files for the first 30 days. Only two Group I participants elected to delete portions of their recordings; one participant deleted one two-minute audio sample and the other deleted two, two-minute samples. Data for four Group I participants were not usable; one recording was lost due to a research assistant error, another was completely inaudible (participant wore the iEAR under her coat), a third was a blank recording and the participant opted not to repeat the assessment, and the fourth recording contained languages that transcribers could not translate. This resulted in a total of 50 Group I participants. All other Group I iEAR recordings were transcribed and transcriptions were then reviewed for errors by a second set of research assistants.

**Research project part II (Group II).** Group II participants ($n = 40$) were randomly assigned to either an eight-week Triple P web-based parenting intervention or a waitlist control group. Triple P aims to reduce child conduct problems by emphasizing positive parenting techniques and enhancing parents’ knowledge, skills, and confidence (Sanders, 1999). Triple P has been found to be an effective intervention for preventing child conduct problems by numerous randomly-controlled treatment studies (Sanders, Markie-Dadds, Tully, & Bor, 2000; Bor, Sanders, & Markie-Dadds, 2002; Markie-Dadds & Sanders, 2006; Sanders, Bor, & Morawska, 2007).

Both intervention and wait-list groups completed three assessments: a baseline; post-test; and eight-week follow-up consisting of the same four-hour home iEAR recording and online survey as Group I. Consent and iEAR procedures for Group II were identical to the procedures used for Group I (review of eligibility criteria, iEAR scheduling, iEAR reminder, follow-up call, opportunity to delete iEAR files, and opportunity to complete online survey on lab computer). Group II mothers picked up and dropped off the iEAR an additional two times to complete the three assessments (baseline, 8 weeks, and 16 weeks). Mothers were compensated $50 for each
assessment after completion of each iEAR recording and web-deployed survey; Group II mothers received a total of a total of $150. Only baseline data for Group II mothers was used in this study. No Group II participants elected to delete portions of their baseline recordings. Data for one Group II participant was lost due to a research assistant error. This resulted in a total of 39 Group II participants.

The present study includes data from a total of 89 undergraduate John Jay College mothers and their one- to six-year-old children. Data from Group I’s one-time assessment and Group II’s baseline assessment were examined. Each mother’s complete iEAR recording was systematically sampled so that 25% of the recording (one hour’s worth) was transcribed by 12 research assistants and coded by ten independent observers.

Transcription procedures. Every fourth two-minute audio file was transcribed for Group I and Group II mothers. The purpose of the use of time-delimited clips was to ensure that all coders would know the precise boundaries of the coding unit and were guided by the same structure (Margolin et al., 1998). All transcriptions were consistent with the protocol developed by iEAR creators. This is the protocol that has been consistently used for iEAR transcriptions in all reviewed iEAR studies (Mehl et al., 2001; Mehl & Pennebaker, 2003; Mehl, 2005; Mehl, 2006; Mehl & Holleran, 2007; Pennebaker, Francis, & Booth, 2001; Ramirez-Esparza, Mehl, Alvarez-Bermudez, & Pennebaker, 2009; Slatcher & Trentacosta, 2011). Transcriptions were verbatim and any issues with the recordings (e.g., unclear recordings, garbled speech, etc.) were noted in the appendix of each transcript. According to this protocol, transcriptions must be verbatim with a few minor exceptions. Words in the iEAR transcript must be present in the Linguistic Inquiry and Word Count (LIWC) data dictionary (Pennebaker, Booth, & Francis, 2007; Tausczik & Pennebaker, 2010). The LIWC data dictionary contains 2,300 words. As per
LIWC dictionary protocol, if a word uttered by a participant was not in the data dictionary, it was changed to another word with a similar meaning and the change was noted in the appendix of the transcript (e.g., dada, daddy, and papa were changed to dad). Filler words (e.g., like, well, you know) and non-fluencies (e.g., uh, uh huh, um) were also noted in the transcript. For more details, see Appendix C.

Margolin et al. (1998) recommends that transcriptions be reviewed by more than one research assistant to ensure quality and also, to assess which transcribers are most careful, dependable, and attentive to detail as this information can be informative when choosing coders. In this study, data was transcribed by one research assistant and reviewed for errors by another. Reviewers listened to participant audio files while reading through the transcripts and made any necessary changes (i.e., incorrect transcription of words, missed words, etc.). Fluent Spanish speakers were assigned iEAR recordings with any Spanish, and all Spanish was translated into English. Translated speech was highlighted in the transcript so that it was easily identifiable. Research assistants who did not speak Spanish flagged files in which Spanish was spoken and immediately contacted the principal investigator who then reassigned the file to a fluent Spanish-speaking research assistant.

**Coding procedures.** Coders were selected as follows: Training of research assistants for transcription included a review and rating of each assistant’s number of errors and adherence to the assignment schedule. The 10 transcribers with the fewest errors and greatest adherence to the assignment schedule were then selected and trained as coders. Demonstration of these behaviors was monitored with a research assistant performance-rating document created for the training group. Each of the 10 coders was responsible for coding 20% of all cases.
This team of 10 graduate and undergraduate research assistants was trained to code the audio samples using the proposed iEAR coding system, the iPARENT (see below for details). Each two-minute audio sample was treated as an item on a 28-item scale with each item receiving either a 5-point Likert-scale rating or a frequency count for each of the parent and child behavior variables on the coding system. Research assistants simultaneously listened to iEAR files and followed along with the transcripts as they coded. Research assistants also maintained in direct view, the follow-up sheet for the assigned case. This sheet listed the identity of each person who was at the home during the iEAR recording (e.g. spouse, boyfriend, etc.), the activities of the mother and the child during this time, any time during which the child was asleep, and any times the mother removed the iEAR or forgot to wear it. Coders also maintained the coding manual in direct view during coding and referred to it continuously.

The study’s Principal Investigator and a senior doctoral student (first author) supervised all coding procedures. Coder training was a continuous process in which coders were initially trained and weekly group maintenance training continued throughout the remainder of the coding period. As a first step, coders were asked to read the coding manual created for this study, after which the distinctions between the codes were clarified and examples were reviewed. Coders were encouraged to ask questions and point out any sources of confusion in the coding manual to help refine the iPARENT coding system and associated procedures (Margolin et al., 1998). According to Margolin et al. (1998), formalized testing should be conducted prior to beginning the coding process to determine if coders have met a predetermined level of competence. Therefore, coders were expected to first pass a quiz assessing their knowledge of code content and secondly, coders’ percent agreement was checked against the investigator’s coded transcripts. Coders were required to meet 80% agreement on two consecutive practice transcripts prior to
beginning the actual coding. This is consistent with the procedures used to establish coder’s readiness to code the well-established DPICS coding system (Eyberg, Nelson, Duke, & Boggs, 2005), after which this coding system has been modeled. In order to inform coders of their progress, and the investigator of potentially problematic codes, weekly meetings were held to discuss coding issues and questions. These meetings also consisted of quizzes and live coding of audio clips to maintain performance and prevent coder slippage (Margolin et al., 1998).

Measures

**REDCap.** Online self-report data were collected and managed using REDCap electronic data capture tools hosted at John Jay College. REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing: (1) an intuitive interface for validated data entry; (2) audit trails for tracking data manipulation and export procedures; (3) automated export procedures for seamless data downloads to common statistical packages; and (4) procedures for importing data from external sources (Harris et al., 2009). The REDCap software is readily available at http://project-redcap.org, and is free of charge to institutional partners, but requires a valid end-user license agreement.

**Demographic Variables.** The following was asked of mothers: age; country of origin; time since migration to US; primary language spoken at home; number of children living at home; single parent status; living arrangements; receipt of welfare; family income; student status (full versus part time and year in program); employment; receipt of financial aid and age at birth of their eldest child. The following was asked about the child: age; sex; and childcare arrangements.
**Parenting Stress Index-Short Form (PSI-SF).** The PSI (Abidin, 1986) is a 36-item questionnaire that assesses the level of stress experienced by the parent-child relationship on a 5-point Likert-type scale (ranging from Strongly Agree to Strongly Disagree). The PSI-SF has high reported internal consistency. It consists of three subscales: Parental Distress; Parent-Child Dysfunction; and Difficult Child. Items assess the level of parenting stress related to personal factors (i.e., romantic relationship factors, psychopathology). The PSI-SF also has a defensive scale consisting of seven items that assess the degree of defensiveness or minimization of problems endorsed by the parent. Each of the subscales, and PSI-SF total score, has demonstrated good reliability (0.87, 0.86, 0.85, and 0.92 respectively) and good test-retest reliability ($r = 0.83, 0.82, 0.79, and 0.84$ respectively) (Copeland and Harbaugh, 2005).

**Parenting scale (PS).** The PS (Arnold, O’Leary, Wolff, & Acker, 1993) is a brief 30-item self-report, Likert-style questionnaire designed to measure dysfunctional parenting in parents of young children. Respondents are asked to choose their typical responses to parent-child conflict on a 7-point scale that presents opposing parent reactions at each end point. The questionnaire consists of three subscales: Laxness (a permissive approach); Overreactivity (harsh discipline, displays of anger, and irritability); and Verbosity (long reprimands or reliance on talking, even when ineffective). Each of the subscales, and PS total score, has demonstrated good internal consistency ($\alpha = 0.83, 0.82, 0.63$, and $0.84$ respectively) and good test-retest reliability ($r = 0.83, 0.82, 0.79$, and $0.84$ respectively). Additionally, PS scores are associated with other self-report measures of child behavior and marital discord, as well as observational measures of discipline and child behavior. Total scores that are one standard deviation above the mean score for a normative sample are considered to be in the clinical range (Arnold et al., 1993).
**Eyberg Child Behavior Index (ECBI).** The ECBI (Robinson, Eyberg, & Ross, 1980) is a widely used parent rating scale that measures externalizing behaviors in children ages two to 16. The scale consists of 36-items and each item represents a separate disruptive behavior problem (e.g., refusing to obey, stealing, fighting, restlessness, etc.). Parents indicate on a seven-point scale how often each behavior occurs and whether they perceive that behavior as being problematic. This results in two summary scores: Intensity Score (IS; total frequency of occurrence) and Problem Score (PS; total number of behaviors that the parent endorses as problematic). Behavioral inventory studies have shown reliability coefficients for the ECBI scales to range from 0.86 (test-retest) to 0.98 (internal consistency). This study uses the Total Intensity and Problem scores.

**Electronic Activated Recorder (iEAR).** The iEAR is an electronically activated device deployed on an iPod device that records behavioral data in naturalistic settings (Mehl, Pennebaker, Crow, Dabbs, & Price, 2001). It has been extensively used by language and communication researchers and has particular value in recording real world, ecologically valid interactions. Research findings have shown that the iEAR accurately and reliably reflects individuals’ natural social linguistic and psychological lives (Mehl, Pennebaker, Crow, Dabbs, & Price, 2001). Mothers were asked to bring home the iEAR for one evening, to record interactions with their child from approximately 5 p.m. to 9 p.m., varying occasionally with mothers’ school and work schedules and with their children’s bedtimes. The iEAR was programmed to record for an alternating two minutes on and ten seconds off. This resulted in a total of 111 two-minute audio samples for each mother; of these, a total of 28 audio samples (every fourth) was sampled, transcribed, and coded. In a recent study of parents and their preschool aged children, data obtained from the iEAR was coded with a version of the Social Environment Coding of Sound
Inventory (SECSI; Mehl & Pennebaker, 2003) adapted to measure child problem behaviors and intercoder reliabilities were found to be very good (ICC = .92) across behaviors (Slatcher & Trentacosta, 2011).

**iPARENT.** The iPARENT is an observational coding system that was developed for the present study to assess naturalistic parenting behavior data obtained from home iEAR recordings during bedtime routines. It aimed to assess the degree of competent (e.g., effective delivery of commands, use of praise, warmth) and problematic (e.g., ineffective use of commands, harsh, disengaged) parenting behaviors that a parent exhibited at home with their child. Specifically, the iPARENT assesses parenting behaviors which, when present or lacking, have been empirically shown to contribute to the development and maintenance of externalizing behaviors in young children.

Existing observational coding systems for parents and children with externalizing behavior problems share some similarities in their codes; however, no single coding system contains the full extent of behavior codes necessary for assessing parenting behavior data obtained with iEAR recordings. The BCS (Conduct Problems Prevention Research Group, 1999), DPICS-R (Eyberg, Nelson, Duke, & Boggs, 2005), and PCOS (Hill, Maskowitz, Danis, & Wakschlag, 2008) reviewed earlier (see pages 36-41) all include codes similar to the iPARENT Engagement code, that is, responsive parenting, acknowledgement, and responsive involvement, respectively. The BCS also assesses some aspects of problematic discipline (commands and negative talk) that are similar to several DPICS-R codes (commands, no opportunity, and negative talk), the RPC negative talk code, and the PCOS constructive discipline domain (ability to communicate directions in clear, direct and confident manner, effectively manage child’s behavior using positive strategies, and flexibly shift parenting strategies when faced with
noncompliance). A limitation of both the BCS and the DPICS-R is their strict reliance on behavioral counts. Behavioral counts may not have the same clinical utility as global properties of behavior (Haynes, 2001; Mash & Foster, 2001), and combining both global ratings and counts may enrich these coding systems. The PCOS uses behavior counts to inform global ratings but has only been validated on a low socioeconomic sample of clinically referred African American families. Lastly, the RPC is much newer and psychometric data is not readily available.

Because the DPICS-R has been subjected to rigorous research that has established the coding system as highly reliable and valid, and because of the similarity of core behavior codes between the DPICS-R and other parent-child coding systems (i.e., praise, commands, negative talk, and child noncompliance), several codes, definitions, and some examples were adapted from the DPICS-R coding system for the iPARENT (See Appendix A). For purposes of construct validation, codes for the iPARENT were also drawn from the Overreactivity and Laxness subscales of the self-report Parenting Scale (Arnold, O’Leary, Wolff, & Acker, 1993).

Existing audio files from a pilot study were observed to gather a list of behavioral indicators that could be coded for in this sample. Parenting behavior codes were developed by creating and adapting behavior codes from the following empirically based sources: (1) research investigating the role of specific parenting practices on the development and maintenance of child externalizing behaviors; (2) relevant content codes and definitions from the Dyadic Parent-Child Interaction Scale – Revised including adaptations of several aspects of Valence, Praise, Commands, Neutral and Negative Talk. (DPICS-R; Eyberg, Nelson, Duke, & Boggs, 2005); and (3) items from key subscales of the Parenting Scale (PS; Arnold et al., 1993; see above), including Lax Discipline and Overreactivity. Although the PS has three subscales (Laxness, Overreactivity, and Verbosity), items from the Verbosity subscale were not used in the
development of the iPARENT. While the other two subscales have demonstrated good internal consistency and test re-test reliability, the Verbosity subscale has demonstrated variable internal consistency across studies. Additionally, many of the items that originally loaded onto this factor have either loaded onto different factors, or have had very low factor loadings (below .4) when the PS has been administered to other samples (Collett, Gimpel, Greenon, & Gunderson, 2001; Karazsia, van Dulmen, & Wildman, 2008; Prinzie, Onghena, & Hellinck, 2007; Rhoades & O’Leary, 2007; Steele, Nesbitt-Daly, Daniel, & Forehand 2005). Child behavior codes were adapted from empirically derived measures of child externalizing behaviors, as defined in the Eyberg Child Behavior Index (ECBI; Robinson, Eyberg, & Ross, 1980) and the DPICS-R coding manual, including Noncompliance, Smart Talk, Cry/Whine/Yell, and Positive Affect. In addition to reviewing the extant literature and other reliable and valid coding systems, iEAR developers and other observational coding researchers from the field of parenting and child behavior research were consulted.

Due to the acoustic nature of the observational data obtained by the iEAR, some traditional observational codes were not feasible, particularly those that convey nonverbal information (i.e., critical facial expressions). However, several key DPICS-R content codes were expected to prove useful after being adapted for iEAR data collection (e.g., quality of commands given by a mother to her child, praise, valence, etc.). Additionally, the DPICS-R content codes were based on core parenting practices taught in Parent Child Interaction Therapy (PCIT), an empirically supported parent training intervention that has been consistently found to reduce child conduct problems in numerous randomized clinical trials (Child Welfare Information Gateway, 2007). The DPICS-R has demonstrated high levels of inter-observer reliability (over 90%) for both parent and child behaviors.
A total of 13 parent behavior codes were developed for the iEAR: (1) engagement; (2) positive parent affect; (3) negative parent affect; (4) labeled praise; (5) unlabeled praise; (6) direct commands; (7) indirect commands; (8) no opportunity to comply; (9) neutral talk; (10) direct negative talk; (11) indirect negative talk; (12) negative talk harshness; (12) coxing; and (13) lenience. A total of six child behavior codes were developed: (1) engagement; (2) compliance; (3) noncompliance; (4) backtalk; (5) cry/whine/yell; and (6) and positive affect. Each of the 28 two-minute audio clips received a rating on a 5-point Likert scale or a frequency count for each of the behavior codes. Due to the nature of the observation, conceptual differences between behavior codes, and past research, it was determined that some codes would be best assessed via global ratings and others via frequency counts. Additionally, consultation with professionals in the field indicated that some behaviors were better assessed globally (engagement [parent and child], parent affect, child affect, and negative talk harshness) and others with frequency counts (praise, commands, neutral talk, negative talk, coxing, lenience, noncompliance, backtalk, and cry/whine/yell). See Appendix A for a summary of content codes and the sources used to develop them. Operating under the assumption that each dyad has a unique baseline level that applies throughout an interaction, proportions of each parenting and child behavior demonstrated throughout the recording were calculated for each participant. A summary of code descriptions and their relative measurement (global rating versus frequency counts) can be found in Appendix C. The iPARENT codes are detailed below.

*Parent engagement* is defined as the degree of parent involvement with their child. This code assesses the amount, not quality, of overall parent-child interaction(s) and accounts for a parent’s responsiveness to the child’s demands for attention. Negative, neutral, and positive involvements all qualify as forms of Engagement. Very low levels of this code would be
indicative of a disengaged parent. A very high score would suggest that a parent is not only available to the child but is also immersed in the activity with the child, as evidenced by clear verbal or vocal interest in the activity with the child. Higher levels of responsiveness are associated with better social and cognitive child outcomes (Barnard, 1997; Landry Smith, Swank, Assel, & Vellet, 2001).

_Parent affect_ assesses the emotional quality of the parent’s audible behaviors and is coded on the basis of tone of voice and/or inflections. The _parent positive affect_ code is meant to assess the parent’s display of warmth interest, and pleasure when communicating with their child. The _parent negative affect_ code is meant to assess the parent’s displays of disapproval, irritability, and anger when communicating with their child. Higher levels of irritability and anger are associated with harsher and more overreactive parenting practices (Shay & Knutson, 2008). Assessing parental affect is especially important in this coding system because it will help coders discriminate between seemingly positive statements (i.e., praise) and negative ones (i.e., criticisms) (e.g., “You are _sooo_ smart, aren’t you?”).

_Praise_ consists of one or more positive evaluative words or phrases that express a favorable judgment on the activity, product, or attribute of the child. There are two kinds of praise codes: _labeled and unlabeled_. Labeled praise specifically communicates to the child what s/he must do again to receive a similar praise (e.g., “I like the way you sit so quietly!”) and an unlabeled praise is a nonspecific verbalization that expresses a favorable judgment (e.g., “I appreciate that.”). Labeled praises are superior to unlabeled ones, because they provide specific information to the child about what the parent is praising, and are therefore more likely than unlabeled praises to increase the rate of the praised behavior (Henderlong & Leppe, 2002).
Commands refer to the instructions that a parent provides the child when requesting a behavior change. There are two types of command codes, direct and indirect. Direct commands are the most effective as they clearly, specifically, and imperatively communicate to the child what behavior is expected of him/her (e.g., “Give me your hand” versus a more vague command to “Be careful”), and increases the odds of compliance (Mandal, Olmi, Edwards, Tingstrom, & Benoit, 2000; Patterson, Dishion, & Bank, 1984).

Neutral talk is defined as a statement that introduces information about people, objects, events, or activities, or indicates attention to the child, but does not clearly evaluate the child or the child’s activities, products, attributes, or choices. Neutral talk contains no orders, demands, praise, or criticism of the child's products or activities. Neutral talk receives a frequency count. This code will be used as a nuisance code in the analyses. This means that with the exception of Engagement, none of the other codes should meaningfully correlate (above .3 or below -.3) with Neutral talk. Neutral talk is expected to correlate with engagement because it directs attention to the child. Please refer to the statistical analysis section for more information.

Negative talk is defined as a verbal expression of disapproval (i.e., direct or implied negative evaluation) of the child or the child's attributes, activities, products, or choices. Negative talk consists of sassy, sarcastic, rude, or impudent speech (i.e., threats, criticisms, name calling, swearing, etc.). Negative talk consists of three separate codes: direct negative talk (negative talk directed at the child), indirect negative talk (negative talk about the child spoken to someone other than the child), and negative talk harshness (the degree of harshness of the negative talk). Direct and indirect negative talks both receive a frequency count and negative talk harshness receives a global rating. Indirect negative talk is the only code that counts language spoken to someone other than the child. Nonetheless, it was considered important to code for as
parents sometimes criticize their children by making negative comments about them to others (e.g., “He drives me crazy!”) Critical parents display higher levels of antagonism, harshness, and verbal responsiveness, and their children have increased likelihood of child externalizing behavior problems (Narayan, Herbers, Plowman, Gewirtz, & Masten, 2012).

Coaxing is defined as a parent’s attempt to obtain the child’s compliance by begging, pleading, or bargaining. Performing these behaviors communicates to the child that s/he has a choice in being compliant, and tends to encourage noncompliance or coercive compliance in which the child will not obey until offered something s/he wants (Wilson & Durbin, 2012).

Lenience assesses the parent’s lack of response to obvious child misbehavior (i.e., screaming, swearing, back talking, etc.). A lack of parental response implies a lack of awareness or concern for noncompliance or other deviant behaviors. This results in a failure to properly socialize the child and increases the likelihood of the child exhibiting externalizing behaviors in the future (Hagan & Dinovitzer, 1999). A lenient parent seems unwilling to make clear, firm commands or to provide reprimands to the child, perhaps in order to avoid a power struggle and/or to minimize conflict (Salari, Terreros, & Sarkadi, 2012).

In order to assess the adequacy and effectiveness of parent behaviors, the last remaining content codes take child behavior into account. The first, child engagement, accounts for the child’s responsiveness to the parent’s requests for attention including negative, neutral, and positive involvements. The second and third, compliance and noncompliance, consist of the total number of times that a child complied or did not comply with a parent’s commands for verbal compliance (e.g., “Tell me what she said.”). A child was considered to be compliant if s/he complied with the parent’s command within 5 seconds of being given that command.
(compliance period adapted from the DPICS-R; Eyberg, Nelson, Duke, & Boggs, 2005). The fourth, *no opportunity to comply*, consists of the number of times a parent gave the child a command but interrupted the compliance period (5-sec following command) with another command or gave the child a command that was not compliable within the compliance period (i.e., remember to take you lunch with you tomorrow). The fifth, *backtalk*, consists of impudent or disrespectful speech including arguing, refusing, counter commanding, criticizing, threatening, and swearing at the parent. In some cases, children may talk back and not comply but children may also talk back and still comply with their parents’ command, thus, discriminating between *noncompliance* and *backtalk*. Furthermore, established behavior rating scales, such as the ECBI, ask parents about their child’s ability to follow direction and their talking back as separate behaviors. Assessing these behaviors separately allows parents and clinicians to identify specific problem areas. The sixth, *cry/whine/yell*, consisted of any time a child cried, whined or yelled. Simultaneously cries, whines, and yells were counted as one occurrence. The seventh and last child code, *positive affect*, consists of the child’s positive evaluative expression of pleasure, warmth, enthusiasm, or gratitude including praise of self or of the parent. Each of these child behavior codes was adapted from the DPICS-R (Eyberg, Nelson, Duke, & Boggs, 2005) and ECBI (Robinson, Eyberg, & Ross, 1980).

**Data Analytic Plan**

Preliminary analyses examined the descriptive statistics of the behavior code ratings and counts. Inter-rater reliability was assessed by calculating the generalizability coefficient, a measure of reliability in Generalizability Theory that is much like the reliability coefficient in classical test theory. However, unlike classical test theory, inter-rater reliability assessments using G-Theory allow for various sources of measurement error to be taken into account.
Generalizability theory (Brennan, 2001; Wasserman, Levy, & Loken, 2009) has been recommended as a framework to enhance the precision of reliability assessments (Lakes & Hoyt, 2009; Stora, Hagvet, & Heyerdahl, 2013). Therefore, this study’s assessment of the iPARENT’s reliability was based on G-theory (Hypothesis 1). The G-study design is (r:p)(i), where r = raters, p = participants (the object of measurement and therefore not a source of error), and i = items (codes). Raters and items constitute two facets of observation for assessing the quality of participants’ parenting practices. Participants are nested within raters (each pair of raters rated 20% of cases) and crossed with items. The present raters are considered to be a random sample from the respective universes of admissible observations and items are considered fixed. In this design, person is confounded with rater and the basis for the generalizability coefficient is to estimate the person main effect as a proportion of all the sources of variance in scores. Because the person main effect is not computable in a nested design, the data was divided into subsamples by rater groups and the data within each subsample was treated as a fully crossed design: p x r x i. Generalizability coefficients for each subsample as well as the median coefficient value are reported. A generalizability coefficient at a value of .70 or above is indicative of a reliable measure. The Generalized Analysis of Variance (GENOVA) software program was used to calculate the generalizability coefficient; this is the only program that has been specifically designed for generalizability theory (Webb, Shavelson, & Haertel, 2006). Additionally, two-way random absolute agreement intraclass correlation coefficients (ICCs; Shrout & Fleiss, 1979) were computed in order to examine the reliability of each individual code and identify suboptimal codes requiring further development. The ICC for each pair of raters as well as the mean ICC value is reported.
Using CEFA 3.04 (Comprehensive Exploratory Factor Analysis; Browne, Cudeck, Tateneni, & Mels, 2010), a factor analysis program designed to perform exploratory factor analysis, a target matrix was constructed to examine the factor structure of the iPARENT (Hypothesis 2). All iPARENT behavior code scores were examined. CEFA provides a variety of fit indices for factor solutions that are not available on SPSS. A root mean square error of approximation statistic (RMSEA) was examined for goodness of fit. The RMSEA reflects the average size of model misfit. RMSEA values less than .05 constitute a good fit, .05-.08 constitutes an acceptable fit, .08-.10 constitutes a marginal fit, and values greater than .10 constitute a poor fit (Browne & Cudeck, 1993). CEFA also provides standard errors for the loadings. Values for practical significance (.40) were examined to see if they fell within the 95% confidence interval.

To examine the convergent validity (Hypothesis 3) of the iPARENT behavior scores, Parenting Scale (PS) Overreactivity and Laxness scale scores were added to the aforementioned factor analysis. The loadings of the PS Overreactivity and Laxness scale scores were examined to see how strongly they loaded onto iPARENT factors that were expected to measure similar constructs. To examine convergent validity of the iPARENT child behavior scores, bivariate correlations between iPARENT Noncompliance, Backtalk, and Cry/Whine/Yell code scores and the Eyberg Child Behavior Index (ECBI) score were examined. iPARENT child behavior scores were expected to be positively correlated with ECBI scores at a value of .30, 95% CI [.12, .46].

To examine the discriminant validity (Hypothesis 4) of the iPARENT, the Neutral Talk code score was added to the aforementioned factor analysis in a separate and final step. The Neutral Talk code score was expected to load onto its own factor.
Bivariate correlations between Parenting Stress Index scores and iPARENT scores of Parent Negative Affect, Negative Talk, Harshness, Coaxing, Lenience, and Praise were examined to assess the relationship between parenting stress and parenting practices (Hypothesis 5). These two constructs are consistently related to one another in prior research (Abidin, 1986; Respler-Herman, Mowder, Yasik, & Shamah, 2012; Solem, Christophersen, & Martinussen, 2011). Parenting Stress Index scores were expected to be positively correlated with iPARENT scores of Parent Negative Affect, Negative Talk, Harshness, Coaxing, Lenience at a value of .30, 95% CI [.12, .46], and negatively correlated with Praise at a value of -.30, 95% CI [-.46, -.12].

Regression analyses were conducted to assess whether high levels of Engagement and parent Negative Talk would concurrently predict child externalizing behavior (Hypothesis 6). Interaction terms of Engagement and Negative Talk (direct, indirect, and harshness) served as the independent variables and child externalizing behavior as assessed by iPARENT Noncompliance (NC), Backtalk (BT), Cry/Whine/Yell (CWY) codes, and ECBI problem and intensity scores served as dependent variables. A negative binomial regression model was specified, as the distribution of the NC, BT, and CWY outcomes had greater variability than expected under a Poisson distribution. The sample means of the outcomes (1.00, 2.89, 12.99) were substantially smaller than their variances (4.28, 29.27, 156.31). These differences suggest that over-dispersion is present and that a Negative Binomial model would be appropriate (Kelly, Haynes, & Marlatt, 2008). An ordinary least squares model was specified for examining the relationship between the interaction terms and ECBI scores. All models were estimated using SPSS, version 17.

Lastly, the feasibility of the iPARENT (Hypothesis 7) was examined by assessing: (1) attrition, (2) the proportion of inaudible iEAR audio, and (3) participant deleted files. This was
compared to iEAR outcomes of other iEAR studies. Participant attrition was compared to findings on existing parent-child observation studies.
CHAPTER SIX: RESULTS

Sample Demographics

A total of 89 mother and child dyads participated in this study. At the time of the study, mothers’ ages ranged from 19 to 38, with a mean age of 24 years ($SD = 2.92$). Children’s ages ranged from 1- to 6.29 years, with a mean age of 3.71 years ($SD = 1.49$), and 57.3% were male. Mothers’ mean age at the time of their child’s birth was 20.59 years ($SD = 2.51$). At the time of the study, most mothers (79.8%) were enrolled as full-time college students and more than 50% were either juniors or seniors. In addition to being enrolled in college, 58.4% of mothers were also employed. On average, the yearly estimated household gross income, including all sources of income and public assistance, was $23,291.14 ($SD = $19,711.64). According to self-report, 81.8% of mothers were receiving financial aid for their studies, 22.2% were receiving child support, and 18.2% were receiving public assistance. Lastly, this sample consisted of a large proportion of self-identified Latina (60.7%) and African American (24.7%) mothers. See Table 1 for more demographic details.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Demographic Characteristics of Mothers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Age (years) $^a$</td>
<td>24.17 ± 2.92</td>
</tr>
<tr>
<td>Age at child's birth (years)</td>
<td>20.59 ± 2.51</td>
</tr>
<tr>
<td>Race</td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>2.03%</td>
</tr>
<tr>
<td>Latino Non-White</td>
<td>37.10%</td>
</tr>
<tr>
<td>Latino White</td>
<td>23.60%</td>
</tr>
<tr>
<td>African American</td>
<td>24.70%</td>
</tr>
<tr>
<td>Other/Mixed</td>
<td>5.60%</td>
</tr>
<tr>
<td>Preferred not to answer</td>
<td>4.50%</td>
</tr>
<tr>
<td>Student Status</td>
<td></td>
</tr>
<tr>
<td>Full-Time</td>
<td>79.80%</td>
</tr>
<tr>
<td>Part-Time</td>
<td>15.70%</td>
</tr>
<tr>
<td>Preferred not to answer</td>
<td>3.40%</td>
</tr>
</tbody>
</table>
Year in College

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>4.50%</td>
</tr>
<tr>
<td>Sophomore</td>
<td>16.90%</td>
</tr>
<tr>
<td>Junior</td>
<td>28.10%</td>
</tr>
<tr>
<td>Senior</td>
<td>46.10%</td>
</tr>
<tr>
<td>Preferred not to answer</td>
<td>4.50%</td>
</tr>
</tbody>
</table>

Employment Status

<table>
<thead>
<tr>
<th>Status</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time</td>
<td>28.10%</td>
</tr>
<tr>
<td>Part-time</td>
<td>30.30%</td>
</tr>
<tr>
<td>Unemployed</td>
<td>39.30%</td>
</tr>
<tr>
<td>Preferred not to answer</td>
<td>2.20%</td>
</tr>
</tbody>
</table>

Relationship Status

<table>
<thead>
<tr>
<th>Status</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not in a relationship</td>
<td>24.70%</td>
</tr>
<tr>
<td>Casual dating relationship</td>
<td>5.60%</td>
</tr>
<tr>
<td>Steady relationship</td>
<td>39.30%</td>
</tr>
<tr>
<td>Engaged</td>
<td>10.10%</td>
</tr>
<tr>
<td>Married</td>
<td>18.00%</td>
</tr>
<tr>
<td>Preferred not to answer</td>
<td>2.20%</td>
</tr>
</tbody>
</table>

Note. *Mean ± standard deviation

**iPARENT Summary Statistics**

The mean of each global rating and sum of each frequency count were calculated across the 28, two-minute audio clips of each participant’s sampled iEAR recording. Afterwards, a mean of the two raters’ ratings was calculated for every code in every case. Proportions for each of the iPARENT frequency count codes were calculated to control for the variability in the amount of mother-child interaction across participants. Each parent behavior was divided by the total number of coded parent behaviors. Each child behavior was divided by the total number of child behaviors. Child compliance and noncompliance frequencies were divided by the total number of compliable commands; these included commands that could be assessed through the iEAR and that gave the child an opportunity to comply. Lastly, No Opportunity was divided by the total number of commands delivered by the parent. Prior to conducting any analyses, all proportion variables were submitted to a logit transformation. Table 2 displays the mean, standard deviation, and range of each iPARENT code across participants.
On average, mothers were passively involved with their children; they responded to most of their children’s calls for attention but were brief, unenthusiastic, and rarely initiated the interaction. Children’s level of engagement was similar to their mothers’ level of engagement. Parent positive and negative affect code scores were low, such that, on average mothers exhibited little to no positive and negative affect. On average, 62% of mothers’ interactions with their children were spent engaging in neutral talk (i.e., mothers providing information). On average, 26% of mothers’ interactions consisted of mothers delivering commands to their children and of these, 62%, on average, did not give the child an opportunity to comply. Commands were coded as No Opportunity to comply if the command was: (1) vague or not observable (i.e., “Calm down” or “Listen”); (2) asked the child to do something that could not be initiated within the five-second compliance period (i.e., “Remember to take your gloves tomorrow”); or (3) interrupted a previous command’s five-second compliance period with another command. Ten percent of mothers’ interactions with their children consisted of the mothers criticizing their children and only .02% consisted of mothers praising their children; this included any compliment or term of endearment delivered to the child within the sampled observation period (i.e., “Good job,” “Nice”). Children received an average of 18 criticisms (direct and indirect negative talk combined) and four praises in the sampled hour; that is, more than four times as many criticisms than praises. On average, criticisms were slightly harsh, that is, many critical remarks were delivered in a calm or pleasant tone but nonetheless contained verbal expressions of disapproval of the child’s attributes, activities, products, or choices. On average, children were observed to comply with compliable commands 63% of the time. Of all the coded child behaviors, 15% consisted of backtalk, 58%, consisted of Cry/Whine/Yells, and 13% consisted of children’s expressions of positive affect.
Table 2  
*Summary Statistics for iPARENT Codes*

<table>
<thead>
<tr>
<th>Code</th>
<th>Code type</th>
<th>Mean (SD)</th>
<th>Range</th>
<th>Mean (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engagement</td>
<td>(1-5)a</td>
<td>2.44 (.57)</td>
<td>2.70</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Positive affect</td>
<td>(1-5)</td>
<td>1.59 (.34)</td>
<td>1.50</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Negative affect</td>
<td>(1-5)</td>
<td>1.57 (.40)</td>
<td>2.25</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Labeled praise</td>
<td>FCb</td>
<td>.34 (.71)</td>
<td>3.50</td>
<td>.00 (.01)</td>
<td>.03</td>
</tr>
<tr>
<td>Unlabeled praise</td>
<td>FC</td>
<td>3.89 (4.73)</td>
<td>34.50</td>
<td>.02 (.02)</td>
<td>.12</td>
</tr>
<tr>
<td>Direct commands</td>
<td>FC</td>
<td>36.86 (25.72)</td>
<td>133.50</td>
<td>.21 (.08)</td>
<td>.49</td>
</tr>
<tr>
<td>Indirect commands</td>
<td>FC</td>
<td>8.47 (6.47)</td>
<td>24.00</td>
<td>.05 (.03)</td>
<td>.16</td>
</tr>
<tr>
<td>Compliance</td>
<td>FC</td>
<td>1.65 (2.42)</td>
<td>13.00</td>
<td>.63 (.37)</td>
<td>1</td>
</tr>
<tr>
<td>Noncompliance</td>
<td>FC</td>
<td>1.03 (2.12)</td>
<td>14.50</td>
<td>.35 (.37)</td>
<td>1</td>
</tr>
<tr>
<td>No opportunity</td>
<td>FC</td>
<td>29.79 (23.11)</td>
<td>121.50</td>
<td>.62 (.15)</td>
<td>.88</td>
</tr>
<tr>
<td>Neutral talk</td>
<td>FC</td>
<td>110.43 (71.50)</td>
<td>381.00</td>
<td>.62 (.11)</td>
<td>.56</td>
</tr>
<tr>
<td>Direct negative talk</td>
<td>FC</td>
<td>18.36 (14.25)</td>
<td>87.00</td>
<td>.10 (.05)</td>
<td>.20</td>
</tr>
<tr>
<td>Indirect negative talk</td>
<td>FC</td>
<td>.30 (.72)</td>
<td>5.00</td>
<td>.00 (.00)</td>
<td>.03</td>
</tr>
<tr>
<td>Negative talk harshness</td>
<td>(1-5)</td>
<td>1.52 (.24)</td>
<td>1.43</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Coaxing</td>
<td>FC</td>
<td>.44 (1.61)</td>
<td>13.50</td>
<td>.00 (.01)</td>
<td>.05</td>
</tr>
<tr>
<td>Lenience</td>
<td>FC</td>
<td>.24 (1.51)</td>
<td>13.50</td>
<td>.00 (.01)</td>
<td>.05</td>
</tr>
<tr>
<td>Child engagement</td>
<td>(1-5)</td>
<td>2.34 (.57)</td>
<td>3.01</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Backtalk</td>
<td>FC</td>
<td>3.05 (5.42)</td>
<td>40.50</td>
<td>.15 (.16)</td>
<td>.71</td>
</tr>
<tr>
<td>Cry/whine/yell</td>
<td>FC</td>
<td>13.13 (12.63)</td>
<td>62.00</td>
<td>.58 (.28)</td>
<td>.94</td>
</tr>
<tr>
<td>Child positive affect</td>
<td>(FC)</td>
<td>1.51 (.36)</td>
<td>1.67</td>
<td>.13 (.11)</td>
<td>.57</td>
</tr>
</tbody>
</table>

Note: a Global ratings on a scale from 1-5; b Frequency counts; c for proportions, FC parent behavior is divided by total number of iPARENT assessed parent behavior, no opportunity is divided by total number of commands, compliance and noncompliance are divided by total number of compliable commands, and remaining child behaviors are divided by total number of iPARENT assessed child behaviors.

iPARENT code correlations were examined and details are displayed in Table 3. The parent engagement code was significantly and positively correlated with parent positive affect ($r = .30, p < .01$), no opportunity ($r = .29, p < .05$), negative talk harshness ($r = .24, p < .05$), coaxing ($r = .37, p < .01$), child engagement ($r = .87, p < .01$), and backtalk ($r = .27, p < .05$). Parent positive affect was significantly correlated with unlabeled praise ($r = .27, p < .01$), no opportunity ($r = .28, p < .01$), neutral talk ($r = .26, p < .05$), direct negative talk ($r = -.34, p < .01$), indirect negative talk ($r = .21, p < .05$), coaxing ($r = .31, p < .01$), and lenience ($r = .24, p < .05$).
Parent’s negative affect was significantly correlated with direct negative talk ($r = .21, p < .05$) and negative talk harshness ($r = .60, p < .01$).

Labeled praises were significantly correlated with only child engagement ($r = .24, p < .05$). Direct commands were significantly correlated with children’s compliance ($r = .31, p < .01$), noncompliance ($r = -.30, p < .01$), neutral talk ($r = -.79, p < .01$), and direct negative talk ($r = .28, p < .01$). No opportunity for compliance was significantly correlated with neutral talk ($r = -.27, p < .01$), negative talk harshness ($r = .32, p < .01$), and children’s backtalk ($r = .31, p < .01$). Direct negative talk was significantly correlated with indirect negative talk ($r = .29, p < .01$), negative talk harshness ($r = .60, p < .05$), coaxing ($r = -.21, p < .05$), and children’s positive affect ($r = -.22, p < .05$). Negative talk harshness was significantly correlated with backtalk ($r = .24, p < .05$). Coaxing was significantly correlated with lenience ($r = .29, p < .01$) and child engagement ($r = .25, p < .05$).

In regards to child behavior, children’s compliance was significantly correlated with noncompliance ($r = -.93, p < .01$) and parents’ direct commands ($r = .30, p < .01$). Child engagement was significantly correlated with parents’ engagement ($r = .87, p < .01$), labeled praises ($r = .24, p < .05$), and coaxing ($r = .25, p < .01$). Children’s backtalk was significantly correlated with parents’ engagement, ($r = .27, p < .05$), no opportunity ($r = .31, p < .01$), negative talk harshness ($r = .24, p < .05$), and child engagement ($r = .36, p < .01$). Cry/whine/yells were significantly correlated with child engagement ($r = -.28, p < .01$) and child positive affect ($r = -.43, p < .01$). Lastly, children’s positive affect was significantly correlated with direct negative talk ($r = -.22, p < .05$).
Table 3

<table>
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<th>Code</th>
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</table>

**Correlations**

**20. CParent**

19. CW

18. Backtalk

17. Child

16. Emotions

15. Coaxing

14. NegTH

13. NegTH

12. NegTH

11. NegTH

10. NegTH

9. NC

8. C

7. IC

6. GC

5. LP

4. IP

3. NegTH

2. Parent Code

1. End
As this was a naturalistic home observation and mothers were asked to go about their usual routines, it was expected that some audio clips would be absent of mother and child interaction (i.e., mother talking on the phone, mother working on homework in another room, child sleeping, mother and child quietly working or playing, etc.). Coders were asked to identify clips in which: (1) there was no parent-child interaction; (2) child was asleep (corroborated by checking follow-up sheets and/or hearing the mother clearly state that the child was asleep); and (3) presence of iEAR problems that prevented research assistants from making out any of the spoken language. The latter included muffled recordings due to participants wearing the iEAR under heavy clothing, participants forgetting to wear the iEAR, and participants choosing to remove the iEAR during the recording, again, corroborated by follow-up sheet data.

Of the 89 cases, 93.3% (n = 83) contained at least one two-minute audio clip in which there was no mother-child interaction. A mean of seven and median of six audio clips included no interaction in each iEAR observation; the range was 19. In 11.2% (n = 10) of cases, 50% or more of the recording contained no mother-child interaction. The number of audio clips with no mother-child interaction was found to be correlated with ECBI problem scores being at or above the clinical cutoff, \( r(87) = .24, p < .05 \), parent’s student status (full or part-time), \( r(87) = .31, p < .01 \), receipt of public assistance, \( r(87) = .26, p < .05 \), receipt of financial aid, \( r(87) = .26, p < .05 \), and receipt of child support, \( r(87) = .23, p < .05 \). A total of 36% (n = 32) of cases contained at least one two-minute audio clip in which there was no mother-child interaction due to the child being asleep. A mean of two audio clips included no interaction due to sleep; the range was 17. An unusual amount of sleep (60 minutes or more) during the observation was detected in 10.1% (n = 9) of sample. The amount of sleep during these evening observations was correlated with child age, \( r(87) = .23, p < .05 \), the length of time mothers spent commuting to and from school,
$r(87) = .21, p < .05$, and with the start time of the recording, $r(87) = .28, p < .01$. Recording start times ranged from 2:00 p.m. to 8:30 p.m. but most mothers, 75.3% ($n = 67$), began their iEAR recordings between 5:00 p.m. and 6:00 p.m. A total of 11.2% ($n = 10$) of cases contained at least one two-minute audio clip in which there was no observable mother-child interaction due to iEAR problems. A mean of .40 audio clips included no interaction due to iEAR problems; the range was 15. The number of audio clips with iEAR problems for each observation was not correlated with any demographic variables. The remaining results of this study have been organized according to the hypotheses.

**Reliability**

**Hypothesis 1:** The proposed observational coding system, the iPARENT, was expected to reliably assess iEAR obtained parenting behavior data, as evidenced by a generalizability coefficient that is greater than or equal to .70. The iPARENT observational coding system was found to be a reliable measure of parenting practices for naturalistic data obtained via the iEAR. The generalizability coefficient was individually calculated for each of the five pairs of raters. Each rater pair rated 20% of cases. All generalizability coefficients were above .70. The coefficients for the five pairs of raters were: .70, .83, .76, .90, and .70, with a median value of .76.

Intraclass correlation coefficients were also calculated in order to assess observer agreement for each individual code (Shrout & Fleiss, 1979). Table 4 shows the ICCs for each code for each pair of raters as well as the median ICC for each iPARENT code. Most codes demonstrated good observer agreement; however, the labeled praise, indirect negative talk, coaxing, and lenience codes demonstrated subpar observer agreement. Coaxing and Lenience had the lowest observer agreement scores with median ICC values of .06 and .00, respectively.
As a result, coaxing and lenience were dropped from all further analyses. All other codes were included in the remaining analyses.

Table 4
Intraclass Correlation Coefficients of iPARENT code ratings

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<th>Codes</th>
<th>Raters 1 &amp; 2</th>
<th>Raters 3 &amp; 4</th>
<th>Raters 5 &amp; 6</th>
<th>Raters 7 &amp; 8</th>
<th>Raters 9 &amp; 10</th>
<th>Median</th>
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<td>.98</td>
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iPARENT Factor Structure

Hypothesis 2: The iPARENT was expected to generate a four-factor solution with factors related to Parental Warmth, Harshness, Leniency, and Child Deviance. The iPARENT engagement (parent and child), praise, parent positive affect, and child positive affect codes were expected to load onto a Warmth factor. The iPARENT parent negative affect and negative talk codes were expected to load onto a Harshness factor. The iPARENT commands, coaxing, and lenience codes were expected to load onto a Leniency factor. The iPARENT noncompliance, backtalk, and cry/whine/yell codes were expected to
load onto a Child Deviance factor. The sample size for this study ($N = 89$) results in an item to participant ratio of 1:5. This ratio meets the guidelines specified by Gorsuch (1983) and Kline (1979), which suggest five to 10 participants per item. Using CEFA 3.04 (Browne, Cudeck, Tateneni, & Mels, 2008), a target matrix was constructed and an exploratory factor analysis was conducted with all iPARENT codes. Examination of communalities, residuals, and factor loadings was used to identify ill-fitting codes; these were removed in a series of steps. The following codes were found to either contribute no unique variance to the model and be entirely explained by one factor or to have very small factor loadings ($< .20$): child engagement; direct command; indirect command; labeled praise; compliance; and child positive affect. None of the iPARENT codes were found to load onto Factor 3 (the hypothesized lenience factor). Therefore, a three-factor solution, excluding the hypothesized lenience factor, was examined with a target rotation continuing to specify the remaining codes on the remaining hypothesized factors. The root mean square error of approximation statistic (RMSEA) = 0.00 indicated that the overall fit of the three-factor model was “good” (Browne & Cudeck, 1993). Factor 1 consists of parent engagement, unlabeled praise, and parent positive affect. Factor 2 consists of parent negative affect, direct negative talk, and indirect negative talk. Factor 3 consists of no opportunity and backtalk. The codes that cluster on the same components suggest that Factor 1 represents “Warmth,” Factor 2 represents “Harshness,” and Factor 3 represents “Ineffective parent-child communication.” Factors 1 and 2 were found to be correlated at a value of $r = .19$. Factors 1 and 3 were found to be correlated at a value of $r = .24$. Factors 2 and 3 were found to be correlated at a value of $r = -.04$. Table 5 shows the factor loadings, their standard errors, and the factor correlations after a target rotation.
Table 5

*Factor Loadings and Factor Correlations for iPARENT codes*

<table>
<thead>
<tr>
<th>Codes</th>
<th>Loadings (SE’s)</th>
<th>Loadings (SE’s)</th>
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<tr>
<td>Backtalk</td>
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<td>.40 (.20)</td>
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</table>

Factor 1

Factor 2

Factor 3

RMSEA = 0.00 (0.00; 0.08)

Validity

**Hypothesis 3:** iPARENT assessment of iEAR parenting behavior data were expected to demonstrate convergent validity with standardized reliable and valid self-report measure of parenting practices (Parenting Scale) and child externalizing behaviors (Eyberg Child Behavior Index). Specifically: (a) iPARENT parent negative affect, and negative talk codes were expected to load onto the same factor as the Parenting Scale’s Overreactivity items; (b) iPARENT commands, coaxing, and lenience codes were expected to load onto the same factor as the Parenting Scale’s Laxness items; and lastly (c) iPARENT noncompliance, backtalk, and cry/whine/yell codes were expected to correlate with Eyberg Child Behavior Index scores of disruptive behavior at a value of .30 or greater. In order to examine the convergent validity of iPARENT parenting behavior scores, a target matrix was constructed and an exploratory factor analysis was conducted with the remaining iPARENT codes from the previous factor analysis and the Parenting Scale Overreactivity and Laxness subscale scores. It
was expected that the Parenting Scale Overreactivity subscale score would load onto the same factor as the parent negative affect, direct negative talk, and indirect negative talk codes. Although it was expected that the Parenting Scale Laxness subscale score would load onto the same factor as the no opportunity and backtalk codes, in fact, both subscale scores loaded negatively onto the same factor as engagement, unlabeled praise, and parent positive affect codes. As seen in Table 6, the factor loading for the Parenting Scale’s Overreactivity subscale on Factor 1 was -.38 and the factor loading for the Laxness subscale on the same factor was -.31. Additionally, as per Browne and Cudeck (1993), the root mean square error of approximation statistic (RMSEA) = .06, suggested that the overall fit of the specified model was “acceptable.”

Table 6

<table>
<thead>
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<th>Codes</th>
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<td>PS Laxness</td>
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<td>No Opportunity</td>
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<td>Factor 3</td>
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RMSEA = 0.059 (0.00; 0.10)

To examine the convergent validity of the iPARENT child behavior scores, bivariate correlations among iPARENT noncompliance, backtalk, and cry/whine/yell code scores and the
Eyberg Child Behavior Index (ECBI) scores were examined. iPARENT child behavior scores were expected to be positively correlated with ECBI scores at a value of at least .30, 95% CI [.12, .46]. In fact, Noncompliance, backtalk, and cry/whine/yell child behavior scores were not significantly correlated with ECBI scores. However, post-hoc analyses revealed that when the sample was restricted to children four-years-old and older, noncompliance was found be significantly correlated with ECBI scores ($r = .36, p < .05$), as predicted.

Hypothesis 4: iPARENT assessment of iEAR parenting behavior data were expected to demonstrate discriminant validity with construct-irrelevant parenting behavior, iPARENT Neutral Talk score. To examine the discriminant validity of the iPARENT coding scheme, the Neutral talk code was added to the factor analysis in a separate and final step. A target matrix was constructed with neutral talk loading onto its own factor. Results of the factor analysis revealed that neutral talk did in fact load onto its own factor with a loading of .70. As per Browne and Cudeck (1993), the overall fit of the specified four-factor model was “good;” RMSEA = .01. The addition of neutral talk to the model caused slight variations in the loadings of the other codes.

Parent engagement, parent positive affect, parent negative affect, and no opportunity loadings decreased by .25, .26, 20, and .05 respectively. Unlabeled praise, direct negative talk, indirect negative talk, and backtalk loadings increased by .18, .08, .16, and .11 respectively. Factor 3 “Neutral Talk,” was not found to strongly correlate with any of the iPARENT factors. Table 7 shows the factor loadings, their standard errors, and the factor correlations after a target rotation.
Table 7
Factor Loadings and Factor Correlations for iPARENT codes

<table>
<thead>
<tr>
<th>Codes</th>
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<td>Factor 4</td>
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</table>

RMSEA = 0.01 (0.00; 0.05)

Parenting Stress and the iPARENT

**Hypothesis 5:** Self-reported parenting stress on the Parenting Stress Index was expected to correlate with iPARENT scores of Parent Negative Affect, Negative Talk, Harshness, Coaxing, and Lenience at a value of .30 or greater; and correlated at a value of -.30 or lesser with iPARENT Parent Positive Affect and Praise scores. Self-reported parenting stress was significantly correlated with iPARENT scores of parent negative affect and labeled praise. Mothers’ negative affect scores were significantly correlated with PSI parent distress scores above the 85th percentile, \( r(87) = -.22, p < .05 \). Labeled praise was significantly negatively correlated with PSI difficult child scores above the 85th percentile, \( r(87) = -.24, p < .05 \). No significant relationship was found between self-reported parenting stress and direct negative talk, indirect negative talk, negative talk harshness, and unlabeled praise. However, the relationship between PSI total stress scores at or above the 85th percentile and negative talk
harshness approached significance, \( r(87) = -.19, p < .10 \) as did the relationship with labeled praise, \( r(87) = -.19, p < .10 \).

Although two of the hypothesized correlational relationships were supported, these relationships were modest. That is, none of these significant correlations reached the hypothesized absolute value of at least .30. Lastly, none of the iPARENT code scores were significantly correlated with the Parent-Child Dysfunction subscale of the PSI. See Table 8 for more details.
Table 8

<table>
<thead>
<tr>
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Note: PSI = Parent Stress Index
* *p < .05. **p < .01.

Correlation Matrix for Parenting Stress Index and iPARENT scores.
The Interaction of iPARENT Engagement and Negative Talk

Hypothesis 6: The interaction of engagement and negative talk iPARENT scores were expected to predict concurrent child externalizing behavior scores, as assessed by iPARENT noncompliance, backtalk, and cry/whine/yell scores and Eyberg Child Behavior Index disruptive behavior scores, respectively. The mean engagement score, rated on a scale of 1-5, was 2.4 (SD = .57). On average, mothers were passively engaged with their children during the home observations, that is, they sometimes initiated interaction, provided minimal attention, and gave brief responses. Direct negative talk scores (DNegT; total number of times a mother was critical towards her child during the sampled observation) ranged from zero to 88 (M = 18.36, SD = 14.25) and the average proportion of mother-child interactions consisting of direct negative talk was 10%. Indirect negative talk scores (INegT; total number of times a mother spoke critically about her child to another individual; it was assumed that the child was within hearing range) ranged from zero to five (M = .30, SD = .72) with the average proportion of interactions consisting of indirect negative talk being 0%. On average, mothers’ negative talk was found to be slightly harsh (NegTH). The mean NegTH score, rated on a scale from 1-5, was 1.52 (SD = .24). All mothers used some DNegT when communicating with their children and 15-88 instances of DNegT were observed among 54% (n = 48) of mothers throughout the observation period. On the other hand, no INegT was observed among 69.7% (n = 62) of the sample, and only 2.2% of the sample was observed to exhibit 4-5 instances of INegT throughout the observation period (i.e. at least once per hour). In summary, mothers’ negative talk was frequent, mostly directed at their children, and on average, slightly harsh.

Child noncompliance scores (NC; total number of times a child was observed to not comply) ranged from zero to 15 (M = 1.03, SD = 2.12). Almost half of the children, 48.9% (n =
did not exhibit any observable NC and 7% \( (n = 6) \) exhibited four to 15 instances of NC throughout the entire observation period (at least once per hour). When mothers delivered compliable commands (commands that did not qualify as ‘no opportunity’ and that could be assessed via iEAR) children were, on average, NC 35% of the time. The total amount of observed NC was found to be significantly positively correlated with: number of compliable commands delivered by mothers, \( r(87) = .45, p < .01 \); total number of child behaviors, \( r(87) = .40, p < .01 \); mothers’ engagement, \( r(87) = .30, p < .01 \); mothers’ DNegT \( r(87) = .30, p < .01 \); indirect negative talk \( r(87) = .2, p < .01 \); and Backtalk (BT), \( r(87) = .45, p < .01 \).

Backtalk scores (BT; total number of times a child talked back to his or her mother) ranged from zero to 41 \( (M = 3.05, SD = 5.42) \). Almost one third of the children, 24.7% \( (n = 22) \), did not exhibit any BT and 23.6% \( (n = 21) \) exhibited four to 41 instances of BT throughout the observation period (at least once per hour). In relation to total iPARENT assessed child behavior, children spent an average of 15% of their mother-child interactions engaging in backtalk. The total amount of observed BT was found to be significantly correlated with: number of compliable commands delivered by mothers, \( r(87) = .31, p < .01 \); total number of child behaviors, \( r(87) = .49, p < .01 \); and NC, \( r(87) = .45, p < .01 \). The relationship between BT and mothers’ negative talk harshness approached significance, \( r(87) = .20, p < .10 \). BT was not correlated with any of the demographic variables.

Cry/whine/yell scores (CWY; total number of times the child cried, whined, or yelled) ranged from zero to 62 \( (M = 13.13, SD = 12.63) \). Only 5.6% \( (n = 5) \) of the children exhibited no CWY and 74.2% \( (n = 66) \) exhibited four to 62 instances of CWY throughout the observation period (at least once per hour). Simultaneous cries, whines, and yells were coded as one instance of CWY. In relation to total iPARENT assessed child behavior, children spent an average of 58%
of their mother-child interactions engaging in CWY. The total amount of CWY was found to be significantly correlated with: child age, $r(87) = -.27, p < .05$; total number of child behaviors $r(87) = .84, p < .01$; DNegT, $r(87) = .22, p < .05$; and NegTH, $r(92) = .23, p < .05$.

Children obtained a mean ECBI intensity score of 90.44 ($SD = 28.77$) with 8.2% of the sample obtaining an ECBI intensity score that was at or above the clinical cut-off. Children obtained a mean ECBI problem score of 9.78 ($SD = 7.60$) with 23.5% of the sample obtaining an ECBI problem score that was at or above the clinical cut-off. ECBI intensity scores were found to significantly correlate with only ECBI problem scores, $r(87) = .74, p < .01$. The relationship between ECBI intensity scores and the number of compliable commands delivered by mothers approached significance, $r(87) = -.21, p < .10$. ECBI problem scores were found to be significantly correlated with: child age, $r(87) = .24, p < .05$; NegTH, $r(87) = .24, p < .05$; and ECBI intensity scores, $r(87) = .74, p < .01$. See Table 9 for more details.
## Table 9: Regression Variable Correlations

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* $p < .05$; ** $p < .01$; + $p < .10$
The variances of the NC, BT, and CWY variables were substantially greater than their means, suggesting overdispersion. The data closely followed a negative binomial probability distribution; therefore, the relationship between the interaction of Engagement and Negative Talk (direct, indirect, and harshness) and NC, BT, and CWY was examined using a negative binomial regression, run on SPSS, version 17. Regression variables were entered in steps. Model 1 included demographic variables: child sex, child age, yearly estimated gross household income, total number of compliable commands (only for the NC regression), and total number of assessed child behaviors. Model 2 included the main effect variables: engagement and negative talk (direct, indirect, and harshness). Lastly, models 3 through 5 each included the addition of an engagement and direct negative talk interaction term. ECBI scores were normally distributed and therefore, the relationship between the interaction variables, ECBI intensity, and ECBI problem scores was examined using a linear regression. All analyses controlled for child sex, child age, and income.

**Noncompliance.** Results of a negative binomial regression indicated that there were significant main effects of child sex, child age, income, direct negative talk, or negative talk harshness on noncompliance. There were significant main effects of compliable commands ($B = .15, p < .01$), mothers’ engagement ($B = .81, p < .01$), and indirect negative talk on child noncompliance ($B = .22, p < .01$) (See Table 10). The trend suggested that as mothers’ engagement and indirect negative talk increased, so did their children’s noncompliance; however, noncompliance appeared to increase more rapidly with increases in engagement than with increases in indirect negative talk (See Figure 1). No significant interaction effects were found.
Table 10

**Negative Binomial Regression of Engagement and Negative Talk Predicting Noncompliance**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
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*Note: Eng = Engagement; DNegT = Direct Negative Talk; INegT = Indirect Negative Talk; NegTH = Negative Talk Harshness

* p < .05. ** p < .01. + p < .10

Figure 1. Main Effects of Engagement and Direct Negative Talk on Noncompliance
A test of noncompliance model effects indicated that the addition of demographic variables in Model 2 resulted in a model that significantly differed from the intercept-only model. Addition of main effect variables in Model 3 also resulted in a model that significantly differed from Model 2 and was the best model fit in the analysis. The addition of the interaction terms in the subsequent models produced models that did not significantly differ from previous models, suggesting no significant interaction terms. See Table 11 for more details about model effects.

Table 11

| Test of Noncompliance Negative Binomial Regression Model Effects |
|---|---|---|
|   | $\chi^2$ | df | $p$ |
| Model 2 | 12.35 | 5 | .03 |
| Model 3 | 6.29 | 1 | .01 |
| Model 4 | 1.60 | 1 | .21 |
| Model 5 | .58 | 1 | .45 |

Note: Model 1 = intercept; Model 2 = child sex, child age, & income; Model 3 = compliable commands, parent engagement, DNegT, INegT, & NegTH; Model 4 = EngXDNegT; Model 5 = EngXINegT; Model 6 = EngXNegTH

**Backtalk.** Results of a negative binomial regression indicated that there were no main effects of child sex, child age, income, mothers’ engagement, direct negative talk, or indirect negative talk. There was however a main effect of total child behavior ($B = .05, p < .01$) and negative talk harshness on children’s backtalk ($B = 1.81, p < .01$) (See Table 12). Figure 2 illustrates the main effects of negative talk harshness. No significant interaction effects were found.
Table 12

*Negative Binomial Regression of Engagement and Negative Talk Predicting Backtalk*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
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*Note:* Eng = Engagement; DNegT = Direct Negative Talk; INegT = Indirect Negative Talk; NegTH = Negative Talk Harshness

* *p < .05. ** p < .01. + p < .10

Figure 2. Main Effects of Negative Talk Harshness on Backtalk

A test of backtalk model effects indicated that the addition of demographic variables in Model 2 resulted in a model that significantly differed from the intercept-only model and was the...
best model fit. Addition of main effect variables in Model 3 did not result in a model that significantly differed from Model 2. The addition of the engagement and DNegT interaction in Model 4, engagement and INegT interaction in Model 5, and engagement and NegTH interaction term in Model 6 did not result in improved model fits. See Table 13 for more details about model effects.

<table>
<thead>
<tr>
<th>Table 13</th>
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<td>1.97</td>
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Note: Model 1 = intercept; Model 2 = child sex, child age, & income; Model 3 = total child behavior, parent engagement, DNegT, INegT, & NegTH; Model 4 = EngXDNegT; Model 5 = EngXINegT; Model 6 = EngX NegTH

Cry Whine Yell. Results of a negative binomial regression revealed a main effect of child age on children’s cry whine yells ($B = -.29, p < .01$), with younger children being more likely to cry, whine, or yell (See Table 14). A main effect of total child behavior was also found, ($B = .06, p < .01$). No main effects of child sex, income, mothers’ engagement, or negative talk (direct, indirect, or harshness) on children’s cry whine yells were observed. Figure 3 illustrates the main effects of child age on cry whine yells. None of the interactions between mothers’ engagement and negative talk were found to significantly predict children’s CWY as assessed by the iPARENT.
Table 14

Negative Binomial Regression of Engagement and Negative Talk Predicting Cry Whine Yell

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<thead>
<tr>
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<td>.66</td>
<td></td>
</tr>
<tr>
<td>INegT</td>
<td>.00</td>
<td>.00</td>
<td>.10</td>
<td>.11</td>
<td></td>
</tr>
<tr>
<td>NegTH</td>
<td>-.70</td>
<td>-.67</td>
<td>-.66</td>
<td>-.80</td>
<td></td>
</tr>
<tr>
<td>EngXDNegT</td>
<td>-.22</td>
<td>-.21</td>
<td>-.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EngXINegT</td>
<td>-.04</td>
<td>-.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EngXNegTH</td>
<td></td>
<td></td>
<td>.06</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Eng = Engagement; DNegT = Direct Negative Talk; INegT = Indirect Negative Talk; NegTH = Negative Talk Harshness
* \(p < .05\), ** \(p < .01\), + \(p < .10\)

Figure 3. Main Effects of Child Age on Cry Whine Yells

A test of cry whine yell model effects indicated that Model 4 was the best model fit. That is, addition of total iPARENT assessed child behaviors, engagement, and negative talk resulted...
in a model that significantly differed from the intercept-only model and the demographic variable model (Table 15).

Table 15
Test of Cry Whine Yell Negative Binomial Regression Model Effects

<table>
<thead>
<tr>
<th>Model</th>
<th>( \chi^2 )</th>
<th>Df</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 2</td>
<td>16.02</td>
<td>11</td>
<td>.14</td>
</tr>
<tr>
<td>Model 3</td>
<td>3.68</td>
<td>1</td>
<td>.60</td>
</tr>
<tr>
<td>Model 4</td>
<td>4.62</td>
<td>1</td>
<td>.03</td>
</tr>
<tr>
<td>Model 5</td>
<td>.20</td>
<td>1</td>
<td>.65</td>
</tr>
<tr>
<td>Model 6</td>
<td>.14</td>
<td>1</td>
<td>.70</td>
</tr>
</tbody>
</table>

Note: Model 1 = intercept; Model 2 = child sex, child age, & income; Model 3 = total child behavior, parent engagement, DNegT, INegT, & NegTH; Model 4 = EngXDNegT; Model 5 = EngXINegT; Model 6 = EngXNegTH

**ECBI scores.** Two hierarchical linear regressions were conducted with ECBI problem scores and ECBI intensity scores as the dependent variables. The independent variables were the same as in the previous negative binomial regressions for NC, BT, and CWY. No significant main effects or interaction effects were found. However, post hoc analyses revealed that for children ages four-years and older (n = 27), the proportion of interactions in which mothers spent engaging in direct negative talk significantly predicted concurrent ECBI intensity scores (\( \beta = 23.60, t (86) = 2.17, p < .05 \)) and child age significantly predicted concurrent ECBI problem scores (\( \beta = -6.12, t (86) = -2.21, p < .05 \)), even after child sex, income, number of compliable commands, total assessed child behavior, engagement, and negative talk (direct, indirect and harshness) were added to the model. The hypothesis that the interaction of mothers’ engagement and their negative talk would significantly predict concurrent child externalizing behavior scores as assessed by the ECBI intensity and problem scales was therefore not supported.
iEAR Feasibility

Hypothesis 7: The iPARENT was expected to prove feasible for research practices. That is, upon inspection of the data, less than 30% of the cases were expected to have dropped out before completing the observation period. Less than 20% of the sample was expected to be uncodable due to failure to wear the device, unclear recordings, and participant deleted files. All consented participants completed the home observation. That is, 0% of participants dropped out before completing the observation period. However, 8.5% of Group I cases and 2.5% of Group II cases (6.42% total), were lost due to iEAR problems such as inaudible recordings when participants forgot to wear the iEAR, wore the iEAR under thick clothing, used language that could not be translated, and three two-minute audio files deleted by participants. The loss of data in this study was in fact minor compared to other iEAR studies (35%, Holtzman, Vazire, & Mehl, 2010; 13.4%, Mehl & Holleran, 2007; 13% and 5% among two samples, Ramirez-Esparza et al., 2009). Lastly, the retention rate in this study was excellent, especially when compared to attrition in other home-visiting studies (32% in Guttenberg et al., 2014; 57% McGuigan, Katzev, & Pratt, 2003; 36% in Fernandez & Eyberg, 2009; and 57% in Wagner et al., 1996).
CHAPTER SEVEN: DISCUSSION

The purpose of this study was to investigate whether a novel recording device, the iEAR, could be used to collect reliable and valid naturalistic home-based parenting data. The coding system developed for this study specifically focused on parenting behaviors that have been consistently found to both maintain and reduce externalizing behavior problems in young children over time (Kawabata, Tseng, IJzendoorn, & Crick, 2011). The sample was not selected for having a high prevalence of child externalizing behaviors. Rather, the extent of child externalizing behaviors and young mothers’ parenting behaviors were coded to assess problematic child and parenting behaviors present in an ethnically diverse community sample. That is, we assessed parenting behaviors that were theoretically and empirically expected to contribute to an increased risk for the development of children’s externalizing behavior problems (Barnard, 1997; Eyberg, Nelson, Duke, & Boggs, 2005; Hagan & Dinovitzer, 1999; Henderlong & Leppe, 2002; Landry Smith, Swank, Assel, &Vellet, 2001; Mandal, Olmi, Edwards, Tingstrom, & Benoit, 2000; Narayan, Herbers, Plowman, Gewirtz, & Masten, 2012; Patterson, Dishion, & Bank, 1984; Salari, Terreros, & Sarkadi, 2012; Shay & Knutson, 2008; Wilson & Durbin, 2012). Problematic child behaviors that could be acoustically assessed were also coded. These included verbal compliance and noncompliance, backtalk, cry/whine/yells, and positive affect. As a function of the audio-recorded nature of the assessment instrument, we did not measure behaviors that were exclusively visually observable, such as facial expressions or gestures.

Behavioral Observations

The sample consisted of 89 low-income college mothers of one- to six-year old children, the majority of whom self-identified as Latina or African American. On average, dyads were
passively engaged with each other. That is, mothers’ positive and negative affect and their children’s positive affect were low when ratings were averaged over the sampled four-hour observation period. On average, mothers spent most of their interactions with their children engaging in neutral talk, followed by delivering commands, providing criticisms, and lastly, providing praise. In fact, the average proportion of time mothers spent praising their children was .02%. Research has consistently found the value in ‘catching one’s child being good’ in order to deliver specific praises to increase the frequency of positive behaviors. Instead many parents respond by delivering negative attention (e.g., criticisms and over using commands) to their children’s negative behaviors (i.e., dawdling, talking back, throwing tantrums, etc.). This consequently increases the frequency of these unwanted behaviors (Scott, 2004).

Parent Child Interaction Therapy (PCIT) was developed on the premise of basic research findings suggesting that promoting positive parenting practices may reduce child externalizing behaviors (Eyberg, Nelson, Duke, & Boggs, 2005). The intervention aims to reduce the risk of children developing and maintaining externalizing behavior problems by coaching parents to use more praise to describe and reflect their children’s behaviors and emotions, and to minimize negative communication such as criticisms and the overuse of commands. By providing parents with effective behavior management strategies, children’s behaviors improve and parenting stress decreases (Chaffin et al., 2004; Nixon, Sweeney, Erickson, & Touyz, 2003; Timmer et al., 2005). In order to successfully complete a course of PCIT, parents must deliver at least ten labeled praises and no more than three criticisms and commands, combined, within a five-minute observation period (Eyberg, Nelson, Duke, & Boggs, 2005). On average, the mothers in this sample did not provide half of the praises required to graduate from a course of PCIT treatment. However, it is not uncommon for parents, particularly stressed parents, to have difficulty
providing their children with praises (Sprang, Clarke, & Bass, 2005). While this was not a clinical sample, it is possible that the children of these mothers are at risk for developing externalizing behavior problems in the future. At the very least, the iPARENT detected sources for intervention, specifically, parenting strategies that could be improved to more effectively address child misbehavior and in turn, potentially decrease parenting stress.

Most cases included at least one two-minute audio clip in which there was no mother-child interaction and in 11.2% of cases, at least half of the one-hour sample of the four-hour observation contained no interaction. Although one might presume this data to be missing, it is not conceptualized in that way for this study. In fact, the degree of lack of interaction is indicative of parent-child difficulties for some of these dyads. In fact, the degree of lack of interaction in the observation was significantly correlated with clinical level ECBI problem scores, parent student status, and receipt of financial assistance (public, financial aid, and child support). This suggests that mothers who interacted the least with their children were most likely to have children with clinically significant behavior problems, were full-time students, and may have been struggling with financial hardship. One third of the sample had at least one two-minute audio clip in which there was no mother-child interaction due to the child being asleep and 10.1% of cases had children that were sleeping for at least 25% of the four-hour observation. These cases were significantly and positively correlated with child age, length of mothers’ commute from school, and the start time of the recording. Although the present study made every attempt to accommodate mothers’ work schedules when selecting the recording period, at times this process meant starting the recording somewhat later in the evening, particularly for working mothers. Future studies should continue to try to seek creative solutions for
accommodating mothers’ schedules while obtaining a recording period in which the parent can arrive home a few hours before their child’s bedtime.

**Reliability**

As hypothesized, the iPARENT was found to be a reliable measure of parenting practices and child behaviors associated with externalizing behavior issues. The generalizability coefficient, analogous to the reliability coefficient in classical test theory (alpha), for each pair of raters reflected this. Examination of iPARENT code ICCs indicated that the coaxing and lenience codes had little to no observer agreement and as a result, these codes were removed from further analyses. Both the coaxing and lenience codes were problematic throughout the training and coding portions of the study. It is possible that a coding scheme that takes chains of behaviors into account would be better equipped to assess coaxing and lenience as these two variables require the observation of two individuals’ responses to one another. Although the labeled praise and indirect negative talk codes had ICC values demonstrating suboptimal observer agreement, they were not removed from the analysis. These ICC values were not as low as those for coaxing and lenience. Also, examination of these codes and discussion of these codes with raters revealed that this may have been largely influenced by the low base rate of these variables rather than due to a combination of low base rate and higher rater confusion, as appeared to be the case with the coaxing and lenience codes. The prevalence of labeled praises and indirect negative talk in this sample was each quite low and it is possible that the low base rates in part explain why the ICC values for these variables were so low. That is, a rater’s error in detecting a single instance of labeled praise could have had a large impact on this variable’s ICC value.
Factor Structure of the iPARENT

It was hypothesized that the iPARENT would generate a four-factor solution with factors related to Parental Warmth, Harshness, Leniency, and Child Deviance, respectively. However, the best-fit model was that of a three-factor solution with parent engagement, parent positive affect, and unlabeled praise codes loading onto a “Warmth” factor; parent negative affect, direct negative talk, and indirect negative talk codes loading onto a “Harshness” factor; and no opportunity and backtalk codes loading onto an “Ineffective demands for compliance” factor. It is, however, advised that future studies focus on increasing the reliability of these codes prior to including them in any further analyses.

At first pass, it was surprising to find that no opportunity loaded onto what initially was hypothesized to be either a “Laxness” or “Child Deviance” factor and later was revised as an “Ineffective demands for compliance” factor. On closer consideration, no opportunity to comply was coded such that this one code captured commands that were unclear, or that provided children with a choice to comply. It is possible that in this sample, mothers of more deviant children tended to use more commands that did not give their child an opportunity to comply, thus suggesting parenting ineffectiveness and the label of “Ineffective demands for compliance” for this factor. It is also possible that this method of eliciting compliance is a relatively lax one, and that children who are asked to comply in this way are in fact less likely to comply. In fact, studies have found that delivering vague commands (“Relax” versus “Please stand still”) and commands that provide children with a choice to comply (“Can you please put the game away?” versus “Please put the book away”) are more likely to result in noncompliance (Schuhmann, Foote, Eyberg, Boggs, & Algina, 1998; Nixon, Sweeney, Erickson, & Touyz, 2003).
Future research with clinical samples will be needed to determine whether this same pattern of findings is obtained when assessing parenting practices at home with use of the iEAR and iPARENT. Future studies should also compare differences in the observations of parent behaviors in families where the mother is parenting alone and families where the mother relies on extended family to also parent her child. Having additional parenting supports could have a significant impact on mothers’ parenting strategies. Also, the present sample was quite ethnically diverse, particularly relative to other samples studied in parent-child interaction studies, and findings may thus reflect a difference in the distribution of parenting behaviors observed in naturalistic settings. Future replication studies with similarly diverse samples are thus warranted.

Lastly, the iPARENT scores suggest that children complied an average of two times and did not comply an average of one time throughout the 4-hour observation period. These two codes were challenging to assess with audio data. In this study, a child’s behavior was only coded as being noncompliant if the child did not comply with their mother’s request for verbal compliance (e.g., “Count to ten”) within the five-second compliance period. Other types of noncompliance could not be assessed, as only audio data was available. It is possible that parents’ demands for compliance could mostly consist of having their children perform visually observable behaviors (i.e., putting toys away, brushing teeth, etc.) rather than verbal responses. It is possible that a demand for verbal compliance in and of itself may not be representative of global noncompliance. Nonetheless, it is a relevant type of noncompliance (i.e., ).

Validity

Contrary to our expectations, convergent validity with the self-reported Parenting Scale (Arnold, O’Leary, Wolff, & Acker, 1993) could not be established. To test this hypothesis, the Parenting Scale subscale scores of Overreactivity and Laxness were added to a factor analysis
along with the remaining iPARENT factors: “Warmth,” “Harshness,” and “Ineffective demands for compliance.” Although the Overreactivity subscale items largely overlap with the parent negative affect and negative talk codes, it did not load highly onto the iPARENT’s “Harshness” factor. The weak relationship between the iPARENT factors and the mothers’ self-report of their parenting may indicate a number of things. First, it may indicate that this observational assessment and self-report are measuring different parenting constructs. It may well be that the self-report measure is measuring parents’ perception of their parenting while the observational measure may be measuring actual parenting strategies. Research finds that self-report measures are prone to recall bias (Morsbach & Prinz, 2006; Stone & Shiffman, 2002), such that parents may place disproportionate emphasis on recent or personally salient events (Zaslow et al., 2006), and may rely overly on their emotional state during the encoding and retrieval of information about past behaviors and their frequencies (Mehl et al., 2001). Parenting research has found that parents have a tendency to answer self-report items in a manner that they believe avoids portraying them as substandard parents (Wilson & Durbin, 2012; Zaslow et al, 2006). In the present sample of mothers with elevated self-reported parenting stress, it is possible that their perception of their parenting practices and their actual parenting practices may have differed. In fact, in this sample, parenting practices as assessed by the iPARENT appeared to be much more ineffective than those endorsed by mothers on self-report scales. When compared to clinical and nonclinical samples, this sample’s Parenting Scale Overreactivity subscale score resembled that of a community sample but the Laxness subscale score resembled that of a clinical sample (Arnold et al., 1993).

The fact that both the Overreactivity and Laxness subscale scores were found to load negatively onto the iPARENT “warmth” factor tells us that the iPARENT’s assessment of
warmth may in fact be measuring more than the construct assessed in prior observational assessment instruments. It may also represent the extent to which a mother is warm, calm, regulated, and attuned to her child’s emotional and behavioral needs. Also, the iPARENT is assessing observable behaviors whereas the Parenting Scale may be assessing a combination of behavior, experiences, and cognitions. For instance, some of the items on the PS Overreactivity subscale could not be assessed in this study (e.g., “Things build up and I do things I don’t mean to,” “I often hold a grudge”). In fact, neither of these items can be assessed either through audio or video observations because they represent the subjective experience of the parent.

Lastly, it is also possible that the current study’s weak relationship between observed and self-reported parenting is due to a qualitative difference between naturalistic parenting data and lab observations. The lengthy, home-based iEAR observations may have resulted in reduced sensitivity to impression management; participants noted that they tended to forget about the iEAR after some time.

iPARENT noncompliance, backtalk, and cry/whine/yell codes were expected to be correlated with ECBI scores at a value of .30, 95% CI [.12, .46] or greater. Conversely, no significant correlations were found. However, throughout the transcription and coding procedures it was noted that many of the youngest children in the sample had underdeveloped language skills that may have affected the validity of our child behavior assessment for them. For that reason, a post hoc analysis examined the relationship between iPARENT assessed child behaviors and mothers’ reports of their children’s behaviors on the ECBI for children ages four-years and older. Results indicated that iPARENT assessed noncompliance of these children was significantly correlated with mothers’ reports on the ECBI. Underdeveloped language skills may result in less language-based misbehavior. It is likely that when younger children in this sample
misbehaved, the behavior may have been manifest by throwing objects, ignoring commands, and/or nonverbally taunting their parent. Therefore, the present results suggest that observational assessment of young children’s behavior in those under 4 years may better be better measured by video or live observation. In order to address this possibility, it will be critical to replicate this study with a larger sample of younger and older children. Future studies should examine minimal language ability needed for the iPARENT to adequately assess child behavior. Additionally, future studies should compare iPARENT parent and child behavior scores in clinical versus nonclinical samples, and investigate whether the scores of children in clinical samples correlate with their ECBI scores. Furthermore, future studies should examine the capacity of the iPARENT to correctly classify parents and children in clinical and nonclinical samples.

Discriminant validity was tested by examining whether the neutral talk code loaded onto its own, separate, factor. As expected, this code, which was created so as not to reflect specific parenting and child behaviors related to externalizing behavior development, was in fact unrelated to the underlying constructs of parent and child behaviors assessed by the iPARENT. This finding implies that the iPARENT system has appropriate discriminant validity.

**Parenting Stress and Parenting Behaviors**

We hypothesized that mothers’ reports of their parenting stress would be significantly correlated with their affect, praise, negative talk, coaxing, & lenience. What we found was that parenting stress significantly and negatively predicted mothers’ observed intensity of negative affect and observed amount of praise they provided to their child. There was no significant relationship with negative talk; however, the relationship between parenting stress and negative talk harshness approached sig. The negative relationship between self-reported parenting stress and negative affect is somewhat counter-intuitive. The iPARENT assessed negative affect such
that more instances of yelling, screaming, sarcasm, or annoyed tones would result in higher ratings of negative affect. It is possible that stressed mothers are in fact distressed, but that their distress may have not been adequately captured by the iPARENT’s negative affect code. Mothers’ increased distress may have resulted in increased disengagement and thus, seemingly lower negative affect. Research has found that depressed mothers tend to be both harsher and more disengaged with their children when compared with non-depressed mothers (Downey & Coyne, 1990; Goodman & Tully, 2006; Lovejoy et al., 2000). The present findings seem to be consistent with such a pattern of maternal disengagement.

Labeled praise was also significantly and negatively correlated with PSI difficult child scores above the 85th percentile. The negative relationship suggests that children whose mothers identified them as being more difficult also tended to receive fewer labeled praises for appropriate behavior. This is in line with research finding that behaviorally disordered children tend to elicit negative parental attention, which in return reinforces their negative behaviors (Eddy, Leve, & Fagot, 2001; Scott, 2004; Sheeber, Davis, & Hops, 2002). These children are in most need of positive attention (i.e., labeled praises) as this has been found to be an effective method for shaping desired behavior (Chronis et al., 2007; Kerr, Lopez, Olson, & Sameroff, 2004).

The fact that mothers who reported higher levels of stress tended to provide less praise reminds us of the importance of parents’ psychological resources for optimal parenting. As posed in Belsky’s process model (1984), parents stress and psychological resources need to be bolstered before one can expect said parent to employ important parenting practices such as praise, especially when interacting with a difficult or behaviorally disordered child. It is also possible that the ethnic diversity of this sample played a role in the amount of labeled praises
observed. Previous research has found significant differences in the relative frequency of praise delivered by White and ethnic minority parents to their children (Ortiz & Del Vecchio, 2013). It is possible that praising a child to increase compliance may be a concept that is more consistent with parenting values socially reinforced among White American culture than in other cultures.

In this study, we did find that parents with higher stress levels were more likely to be harsh when engaging in negative talk. On the other hand, the nonsignificant relationship between mothers’ self-reported stress and their direct and indirect negative talk and coaxing scores was surprising. Previous research has found that highly stressed parents tend to be harsher, more critical, and more likely to engage their children in coercive exchanges than less stressed parents (Patterson, 1982; Sprang, Clarke, & Bass, 2005). Direct and indirect negative talk included critical statements that varied in degree of harshness and ranged anywhere from a playful critical remark (i.e., “Why are you being such a little brat, baby boy?”) to a hostile critical remark (i.e., “You are an idiot!”). It is possible that many of the direct and indirect negative talk remarks that received low harshness ratings were made by mothers who were not as stressed, thus, making it appear as though there is no relationship between mothers’ stress and their propensity to be critical of their children. It is also possible that mothers of older children may have been more likely to deliver critical remarks than mothers of younger children. While not all critical parents would report high levels of stress, highly stressed parents are more likely than less stressed parents to be critical. In fact, self-reported stress has been found to be a consistent predictor of parents’ critical verbalizations towards their children (Del Vecchio et al., 2014). Perhaps this relationship was better reflected in the association of parenting stress with harsh negative talk, rather than just direct or indirect negative talk. Higher degrees of harshness may indicate more
overt negative affect possibly resulting from limited psychological resources and/or limited social supports.

Although most of the hypothesized correlational relationships were supported, none of these significant correlations reached the hypothesized absolute value of .30 or greater. They did, however, fall within the 95% confidence interval and thus are nonetheless of clinical significance. The lower than expected correlation is most likely due to the small sample size of this study. Replication of the study with a larger sample in the future is thus certainly warranted.

**The Interaction of Engagement and Negative Talk**

Contrary to our prediction that the interaction of mothers’ engagement and their negative talk would predict concurrent child behavior scores assessed by the iPARENT & the ECBI, no interaction effects were observed. There were, however, significant main effects of engagement and negative talk on child behavior as assessed by the iPARENT, but not by the ECBI. Mothers’ level of engagement and indirect negative talk significantly predicted their children’s noncompliance frequency. Mothers’ negative talk harshness scores predicted their children’s backtalk frequency. iPARENT-assessed parenting behaviors, such as negative talk, did not strongly predict concurrent child behavior problems as assessed by the iPARENT or the ECBI.

Past research has repeatedly found that that parents’ criticalness significant influences their children’s behavioral development. Parents who are critical, as evidenced by high rates of negative talk, are more likely to engage their children in coercive exchanges and to have children with externalizing behavior problems (Dishion & Patterson, 1997; Patterson 1982; Robinson & Eyberg, 1981). One example of such externalizing behavior is noncompliance. By delivering criticisms, a parent models an ineffective method for interpersonal interactions, for obtaining compliance, and for coping with negative emotions. According to Bandura’s social learning
theory (1978), the child is likely to imitate these behaviors in interactions with the parent. In one study comparing children with clinically significant conduct problems and children without, parents of conduct disordered children made more than three times more harsh critical remarks to their children than parents of children without conduct problems (Robinson & Eyberg, 1981). Furthermore, research has found that parents’ expressed emotion, “the critical and emotionally over-involved attitudes a relative expresses when speaking about a family member” (Vaugh & Leff, 1971), is predictive of psychiatric problems in children (Han & Shaffer, 2014), including externalizing behavior problems (Peris & Hinshaw 2003). In fact, in a community sample of mothers and their 8-11 year-old children, mothers’ harshness towards their children was found to exert a significant indirect effect on child externalizing behavior problems, through child negative emotion dysregulation (Han & Shaffer, 2014). It is possible that the lack of strong associations between mothers’ criticalness and child externalizing behaviors in this sample may have been due to the overall low level of criticism harshness, to the young age of the children in the sample, and to the cross sectional design of this study.

Given the above research support for the association of maternal harshness with child externalizing, the absence of such associations in this sample warrants further consideration. For instance, perhaps the cross-sectional study does not reflect an association that may develop over time. Multi-wave assessments would be useful in determining whether mothers’ negative talk is consistent over time, and/or whether it is predictive of subsequent child externalizing problems as the child ages. It is possible that while current negative talk may not predict concurrent ECBI scores, it may predict future ECBI scores. The developmental cascade model poses that early interactions can result in “chain-reactions,” “snowballing,” “amplification,” or “progressive effects” of subsequent risk across the lifespan (Masten & Cicchetti, 2010; Ehrensaft, Knous-
Westfall, Lopez, Kamboukos, & Brotman, in review), such that small changes in childhood may not appear to have detectable effects until later points in childhood or even adolescence. Future studies should aim to examine whether mothers’ consistent use of negative talk predicts future behavior problems as assessed observationally via the iPARENT as well via self-report measures (i.e., ECBI). Of note, observational and self-report data with this sample are currently being collected on other time points. Furthermore, future research should measure chains of parent-child behaviors to get at the immediate effect of parent behavior on child behavior and vice versa.

**iEAR Feasibility**

Our data suggest that the iEAR methodology has excellent feasibility. Although there were initial concerns that this new methodology for measuring parent-child interactions would be perceived as intrusive and therefore result in participant attrition, all consented participants completed the study. This was likely due to the approaches used to explain and implement the assessment. First, researchers assured participants that the research team did not want to hear anything that they did not want to share; accordingly, each participant was allotted 30 days to review and delete any audio clips that they did not feel comfortable sharing. Surprisingly, hardly any participants elected to review and delete their iEAR data and of the two participants that did, at most two 2-minute audio clips were deleted. Secondly, research assistants took the time to help participants feel at ease with the device and directly elicited and answered questions about the iEAR. Lastly, the ability to complete the observation at home, rather than having to bring their child to the lab, led to reduced travel time for participants who had busy and often inflexible schedules in view of their multiple roles as mothers, students, and employees.

Only a small percentage of data (6.42%) was lost due to iEAR difficulties (inaudible recordings, use of language that could not be translated, and deleted audio clips). This proportion
of data loss is minor compared to other iEAR studies. Mehl & Holleran (2007) lost 13.4% of participant data due to iEAR technical difficulties. In Ramirez-Esparza et al. (2009), participants wore the iEAR continuously for two weekdays. Across American and Mexican participants, 13% and 5% of the data, respectively, were invalid due to participants not wearing iEAR, insufficient ambient sound, and/or poor quality recording. Holtzman, Vazire, & Mehl (2010) asked participants to record during waking hours over a four-day period. If the entire four-day period is taken into account, 35% of participant data would be missing; however, this number is likely an overestimate since participants were only asked to record during waking hours and specifics regarding missing data were not provided in the article. Furthermore, when compared to other home studies, the attrition rate in this study is excellent (32% in Guttenberg et al., 2014; 57% McGuigan, Katzev, & Pratt, 2003; 36% in Fernandez & Eyberg, 2009; and 57% in Wagner et al., 1996).

Parenting and family research has experienced many challenges with engaging and retaining participants (Axford et al., 2012), and these challenges have been even greater when working with participants from racial and ethnic minority backgrounds (Coatsworth, Duncan, Pantin, & Szapocnik, 2006; Sanders & Kirby, 2012). In an observational study of parent-child interactions among Spanish-speaking immigrant Latino families, 20% of participants felt that the structured laboratory parent-child observation was strange and 10% felt uncomfortable (Rodriguez, Rodriguez, & Bates, 2006). However, Rodriguez et al. (2006) used a variety of methods to engage and retain participants. Mainly, they attempted to facilitate families’ comfort and increase trust. Participants were recruited from a local church and by word of mouth throughout the community, appointment times were set up entirely at the parent’s convenience (day and nighttime hours, weekday, and weekends), childcare and transportation were provided,
parking was paid, snacks were provided, and items were read to parents for whom literacy was an issue.

In the current study, several methods were put in place to engage and retain this diverse group of highly stressed mothers. These included: flexible appointment times; delivery and pick-up of iEAR devices for a few mothers who could not make it to the laboratory; provision of childcare; delivery of reminders for remote recordings (via text message or phone call); and giving participants the opportunity to delete any audio clips that they did not wish to share with the research team. Many of the issues that did arise were due to unexpected participant behaviors that resulted in low quality recordings at the beginning of this study (e.g., wearing iEAR under clothing). Participants should be instructed to avoid wearing the device underneath their clothing and to wear the device on their body throughout the recording period. This will likely help to reduce some of the minor data loss observed in this study.

Lastly, minority stress theory (Meyer, 2003) suggests that racial prejudice and discrimination are stressful, additive to other stress, chronic, and socially based. Minority stress may lead to substantial expectations of categorization, rejection and harm that compromise engagement in social institutions, including academic research. By measuring behaviors outside of the laboratory and in the participant’s familiar environment, the iEAR may have reduced participants’ expectations of judgment and harm and, thus, improved recruitment and retention.

**Limitations and Future Directions**

As would be expected with any new research tool and its first-time implementation, several limitations were noted. First, the generalizability of this study is limited to young mothers attending post-secondary institutions, a rather specific sample of mothers and subsample of
ethnic minority mothers. The fact that these mothers were enrolled in college-level courses speaks to a level of psychological and likely social resources available to them that may not be available to the average young parent. Future studies should examine the validity of iPARENT data in different samples of mothers and their children. On the other hand, the sample represents a relatively lower income group of students, given that these were drawn from a public, urban college with large proportions of low income and first generation minority students.

Secondly, it was not possible to examine the differences in iPARENT assessed parenting and child behaviors between clinical and nonclinical samples. Future studies should aim to examine these differences in order to determine levels of specific parenting practices associated with clinically significant conduct problems, and to examine the iPARENT’s capacity to discriminate between clinical and non-clinical samples. Although the present study had a low prevalence of clinically significant externalizing behavior problems, parenting practices that have been found to increase the risk for the development of these behaviors were prevalent among this sample. Third, the cross-sectional nature of this study, limited our ability to determine whether iPARENT assessed parenting behavior was contributing to their children’s externalizing behavior problems. However, previous research has established a strong link between the assessed behaviors and the development of externalizing behavior problems. Therefore, the iPARENT certainly was able to identify targets of intervention, such as mothers’ use of commands, criticisms, and harshness as well as overall patterns of engagement, parent negative affect, and ineffective parent-child communication. Future studies should, nonetheless, examine the relationship between iPARENT assessments and its prospective longitudinal relationship with externalizing behaviors in diverse populations.
Due to the nature of the iEAR data, non-verbal behavior could not assessed. It is possible that this type of data may have an impact on the assessment of certain variables and/or the relationship between iPARENT code scores and self-report measures. For instance, facial expressions of displeasure and pleasure could have affected the affect code scores for both mothers and their children. Also, direct observation of the dyad could result in lower engagement, noncompliance, and compliance code scores as parents and children could be quietly engaged with one another and children could be quietly complying or not complying with their mother’s commands. It is currently impossible to know whether this is truly the case and therefore, future studies should examine differences between audio and video observational assessments of parenting. In order to answer this question, future studies should compare iPARENT observations to in-person or video observations to determine whether body language and other non-verbal behavior data has a significant impact on the ability to assess variables such as affect, engagement, and compliance and whether having this information increases the correlational relationship between the iPARENT and self-report measures. Assessing the extent to which body language contributes to the assessment of these behaviors, for both older and younger children, could also provide useful information about the practical use of the iPARENT in assessing these behaviors. Furthermore, the extent to which nonverbal data, in comparison to iPARENT data, adds to the assessment of parenting behaviors increasing the risk for externalizing behavior problems is another important question. This is a critical question, as the use of audio recordings is likely to be less costly and intrusive than videotaped recordings, particularly for the lengthy recording periods that the iPARENT allows the researcher to access.

Finally, the iPARENT-rated observations in this study were rather lengthy, especially when compared to other studies’ laboratory observations, which typically run for 5-15 minutes.
Nonetheless, all participants completed the study despite their at-risk status. One possible reason for this is that home observations facilitated participation by reducing transportation barriers and time constraints. The ability to retain all participants in this sample is extraordinary, especially when taking into account the level of stress, multiple role strain, and time constraints that were present. In fact, the ability of the iEAR to record for such long periods may be a particular strength of the instrument, perhaps helping mothers and their children become more comfortable with the device over the course of the recording period, and likely resulting in reduced impression management. Although transcription and coding procedures included a few hours of work for each case, the data provided was rich. To our knowledge, this is the first study to have been able to obtain data from a long, and likely more representative, naturalistic observation of parent-child interactions. For feasibility reasons related to coding and clinician use, it would be useful to determine whether reducing the length of sampled observation or the proportion of all audio-clips coded, changes the reliability of the resultant data. Specifically, future research should examine whether shorter clips, or fewer than 25% of randomly sampled clips, can provide reliable and valid data. Finally, future studies should examine the clinical utility of the coding system by using it to measure frequency and proportion of interactions consisting of criticisms and praises delivered over time among participants assigned to parenting intervention and wait-list groups.

Conclusion

The present study provides important data about the use of a smartphone-based electronically activated audio recorder to collect and code naturalistic home observations of parent and child behaviors shown to increase the risk for the development and maintenance of externalizing behavior problems. The present study found that study procedures could be used to
successfully engage stressed and at-risk samples of mothers and their children in observational research by reducing barriers to participation. The resultant iPARENT assessment of parenting and child behaviors was found to be reliable and to assess mothers’ warmth, harshness, and ineffective demands for compliance. While it is possible that there may be limitations in assessing specific parent and child behaviors in the absence of nonverbal data, key, clinically relevant parenting behaviors can be measured with the iPARENT, including parents’ use of criticism, harshness, and praise, as well as overall patterns of engagement. Furthermore, mothers’ use of criticism and degree of harshness were found to predict concurrent levels of noncompliance and backtalk despite the lack of nonverbal data. The results of this study suggest that the new iPARENT observational assessment measure may be used to promote research participation of at-risk and difficult-to-reach ethnic minority families in parent-child research, to observationally assess parenting and child behaviors associated with externalizing behavior problems. Future research with longitudinal designs and larger sample sizes is warranted to assess the extent to which this measure is sensitive to intervention-based changes in parenting and child behavior.
# APPENDIX A

* iPARENT Content Codes and Sources *

<table>
<thead>
<tr>
<th>I. Parent Behaviors</th>
<th>II. Child Behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content Code</td>
<td>Source</td>
</tr>
<tr>
<td>1. Consistency</td>
<td>Literature</td>
</tr>
<tr>
<td>2. Engagement</td>
<td>Literature</td>
</tr>
<tr>
<td>5. Commands</td>
<td>DPCIS-R &amp; Literature</td>
</tr>
<tr>
<td>6. Neutral Talk</td>
<td>DPICS-R</td>
</tr>
<tr>
<td>7. Negative Talk</td>
<td>DPICS-R, PS, &amp; Literature</td>
</tr>
<tr>
<td>8. Coaxing</td>
<td>Literature &amp; PS</td>
</tr>
<tr>
<td>9. Lenience</td>
<td>Literature &amp; PS</td>
</tr>
</tbody>
</table>
APPENDIX B

1. Parenting Stress Index

For the following questions, tell me if you Strongly Agree, Agree, Are Not Sure, Disagree, or Strongly Disagree.

Please answer the following questions about your child that is 6 years of age or younger. Remember, if you have more than one child age 6 or under, please answer about the oldest of those children.

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>psi1</td>
<td>I often have the feeling that I cannot handle things very well.</td>
<td>1= Strongly Agree 2= Agree 3= Not Sure 4= Disagree 5= Strongly Disagree</td>
</tr>
<tr>
<td>psi2</td>
<td>I find myself giving up more of my life to meet my children’s needs than I ever expected.</td>
<td>same</td>
</tr>
<tr>
<td>psi3</td>
<td>I feel trapped by my responsibilities as a parent.</td>
<td>same</td>
</tr>
<tr>
<td>psi4</td>
<td>Since having my child, I feel that I am almost never able to be myself.</td>
<td>same</td>
</tr>
<tr>
<td>psi5</td>
<td>Since having a child, I feel that I am almost never able to do things that I like to do.</td>
<td>same</td>
</tr>
<tr>
<td>psi6</td>
<td>I am unhappy with the last purchase of clothing that I made for myself.</td>
<td>same</td>
</tr>
<tr>
<td>psi7</td>
<td>There are quite a few things that bother me about my life.</td>
<td>same</td>
</tr>
<tr>
<td>psi8</td>
<td>Having a child has caused more problems than I expected in my relationship with my spouse (or male/female friend).</td>
<td>same</td>
</tr>
<tr>
<td>psi9</td>
<td>I feel alone and without friends.</td>
<td>same</td>
</tr>
<tr>
<td>psi10</td>
<td>When I go to a party, I usually expect not to enjoy myself.</td>
<td>same</td>
</tr>
<tr>
<td>psi11</td>
<td>I am not as interested in people as I used to be.</td>
<td>same</td>
</tr>
<tr>
<td>psi12</td>
<td>I don’t enjoy things as I used to.</td>
<td>same</td>
</tr>
<tr>
<td>psi13</td>
<td>My child rarely does things for me that make me feel good.</td>
<td>same</td>
</tr>
<tr>
<td>psi14</td>
<td>Sometimes I feel my child doesn’t like me and doesn’t want to be close to me.</td>
<td>same</td>
</tr>
<tr>
<td>psi15</td>
<td>My child smiles at me much less than I expected.</td>
<td>same</td>
</tr>
<tr>
<td>psi16</td>
<td>When I do things for my child, I get the feeling that my efforts are not appreciated very much.</td>
<td>same</td>
</tr>
<tr>
<td>psi17</td>
<td>When playing, my child doesn’t often giggle or laugh.</td>
<td>same</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------------------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>psi18</td>
<td>My child doesn’t seem to learn as quickly as most children.</td>
<td>same</td>
</tr>
<tr>
<td>psi19</td>
<td>My child doesn’t seem to smile as much as most children.</td>
<td>same</td>
</tr>
<tr>
<td>psi20</td>
<td>My child is not able to do as much as I expected.</td>
<td>same</td>
</tr>
<tr>
<td>psi21</td>
<td>It takes a long time and it is very hard for my child to get used to new things.</td>
<td>same</td>
</tr>
<tr>
<td>psi23</td>
<td>I expected to have closer and warmer feelings for my child than I do and this bothers me.</td>
<td>same</td>
</tr>
<tr>
<td>psi24</td>
<td>Sometimes my child does things that bother me just to be mean.</td>
<td>same</td>
</tr>
<tr>
<td>psi25</td>
<td>My child seems to cry or fuss more often than most children.</td>
<td>same</td>
</tr>
<tr>
<td>psi2</td>
<td>My child generally wakes up in a bad mood.</td>
<td>same</td>
</tr>
<tr>
<td>psi27</td>
<td>I feel that my child is moody and easily upset.</td>
<td>same</td>
</tr>
<tr>
<td>psi28</td>
<td>My child does a few things which bother me a great deal.</td>
<td>same</td>
</tr>
<tr>
<td>psi29</td>
<td>My child reacts very strongly when something happens that my child doesn’t like.</td>
<td>same</td>
</tr>
<tr>
<td>psi30</td>
<td>My child gets upset easily over the smallest thing.</td>
<td>same</td>
</tr>
<tr>
<td>psi31</td>
<td>My child’s sleeping or eating schedule was much harder to establish than I expected.</td>
<td>same</td>
</tr>
<tr>
<td>psi34</td>
<td>There are some things my child does that really bother me a lot.</td>
<td>same</td>
</tr>
<tr>
<td>psi35</td>
<td>My child turned out to be more of a problem than I had expected.</td>
<td>same</td>
</tr>
<tr>
<td>psi36</td>
<td>My child makes more demands on me than most children.</td>
<td>same</td>
</tr>
<tr>
<td>psi22</td>
<td>How well do you think you manage as a parent? Would you say:</td>
<td>1= You are not very good at being a parent 2= A person who has some trouble being a parent 3= An average parent 4= A better than average parent 5= A very good parent</td>
</tr>
<tr>
<td>psi32</td>
<td>How hard is it to get your child to do something or stop doing something? Would you say it is:</td>
<td>1= Much harder than I expected 2= Somewhat harder than</td>
</tr>
</tbody>
</table>
| psi33 | Think carefully and count the number of things, which your child does that bother you. For example, dawdles, refuses to listen, overactive, cries, interrupts, fights, whines, etc. | I expected  
3= About as hard as I expected  
4= Somewhat easier than I expected  
5= Much easier than I expected  
1= 1-3  
2= 4-5  
3= 6-7  
4= 8-9  
5= 10+ |
2. Parenting Scale

Below are items that describe some styles of parenting. For each item, choose the number that best describes your style of parenting with your child during the past 2 months. Choices 1 and 7 correspond to the two extremes listed for each item. If your style of parenting falls somewhere in between these two extremes, then choose a number between 2 and 6.

Please answer the following questions about your child that is 6 years of age or younger. If you have two or more children age 6 or under, please answer about the oldest of those children.

All answer choices are on a scale from 1 to 7, labels are only given to extremes, i.e., 1 and 7.

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>ps1</td>
<td>When my child misbehaves…</td>
<td>1= I do something right away. 7= I do something about it later.</td>
</tr>
<tr>
<td>ps2</td>
<td>Before I do something about a problem…</td>
<td>1= I give my child several reminders or warnings. 7= I use only one reminder or warning.</td>
</tr>
<tr>
<td>ps3</td>
<td>When I'm upset or under stress…</td>
<td>1= I am picky and on my child's back. 7= I am no more picky than usual.</td>
</tr>
<tr>
<td>ps4</td>
<td>When I tell my child not to do something…</td>
<td>1= I say very little. 7= I say a lot.</td>
</tr>
<tr>
<td>ps5</td>
<td>When my child pesters me…</td>
<td>1= I can ignore the pestering. 7= I can't ignore the pestering.</td>
</tr>
<tr>
<td>ps6</td>
<td>When my child misbehaves…</td>
<td>1= I usually get into a long argument with my child. 7= I don't get into an argument.</td>
</tr>
<tr>
<td>ps7</td>
<td>I threaten to do things that…</td>
<td>1= I am sure I can carry out. 7= I know I won't actually do.</td>
</tr>
<tr>
<td>ps8</td>
<td>I am the kind of parent that…</td>
<td>1= Sets limits on what my child is allowed to do. 7= Lets my child do whatever he or she wants.</td>
</tr>
<tr>
<td>ps9</td>
<td>When my child misbehaves…</td>
<td>1= I give my child a long lecture. 7= I keep my talks short and to the point.</td>
</tr>
<tr>
<td>ps10</td>
<td>When my child misbehaves…</td>
<td>1= I raise my voice or yell. 7= I speak to my child calmly.</td>
</tr>
<tr>
<td>ps11</td>
<td>If saying no doesn't work right away…</td>
<td>1= I take some other kind of action. 7= I keep talking and trying to get through to my child.</td>
</tr>
<tr>
<td>ps12</td>
<td>When I want my child to stop doing something…</td>
<td>1= I firmly tell my child to stop. 7= I coax or beg my child to stop.</td>
</tr>
<tr>
<td>ps13</td>
<td>When my child is out of my sight…</td>
<td>1= I often don't know what my child is doing.</td>
</tr>
<tr>
<td>ps14</td>
<td>After there's been a problem with my child…</td>
<td>7= I always have a good idea of what my child is doing.  1= I often hold a grudge.  7= Things get back to normal quickly.</td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ps15</td>
<td>When we're not at home…</td>
<td>7= Things build up and I do things I don't mean to.  1= Never or rarely.  7= Most of the time.</td>
</tr>
<tr>
<td>ps16</td>
<td>When my child does something I don't like…</td>
<td>7= I often let it go.  1= I handle the problem like I usually would.  7= I don't say I'm sorry.</td>
</tr>
<tr>
<td>ps17</td>
<td>When there's a problem with my child…</td>
<td>7= I let my child get away with a lot more.  1= Things get back to normal quickly.</td>
</tr>
<tr>
<td>ps18</td>
<td>When my child misbehaves, I spank, slap, grab, or hit my child…</td>
<td>7= I offer my child something nice so he/she will behave.  1= I make my child tell me why he/she did it.</td>
</tr>
<tr>
<td>ps19</td>
<td>When my child doesn't do what I ask…</td>
<td>7= I take some other action.  1= I often don't carry it out.  7= I always do what I said.</td>
</tr>
<tr>
<td>ps20</td>
<td>When I give a fair threat or warning…</td>
<td>7= I get so frustrated or angry that my child can see I'm upset.  1= I let it go that time.</td>
</tr>
<tr>
<td>ps21</td>
<td>If saying no doesn't work…</td>
<td>7= I almost always use bad language.  1= I rarely use bad language or curse.</td>
</tr>
<tr>
<td>ps22</td>
<td>When my child misbehaves…</td>
<td>7= I don't say I'm sorry.  1= I tell my child I am sorry about it.</td>
</tr>
<tr>
<td>ps23</td>
<td>When my child misbehaves…</td>
<td>7= I stick to what I said.  1= I let my child do it anyway.</td>
</tr>
<tr>
<td>ps24</td>
<td>If my child misbehaves and then acts sorry…</td>
<td>7= I let it go that time.  1= I handle the problem like I usually would.</td>
</tr>
<tr>
<td>ps25</td>
<td>When my child misbehaves…</td>
<td>7= I rarely use bad language or curse.  1= I almost always use bad language.</td>
</tr>
<tr>
<td>ps26</td>
<td>When I say my child can't do something…</td>
<td>7= I say no or take some other action.  1= I handle the problem like I usually would.</td>
</tr>
<tr>
<td>ps27</td>
<td>When I have to handle a problem…</td>
<td>7= I don't say I'm sorry.  1= I make my child tell me why he/she did it.</td>
</tr>
<tr>
<td>ps28</td>
<td>When my child does something I don't like, I insult my child, say mean things, or call my child names…</td>
<td>7= Most of the time.  1= Never or rarely.</td>
</tr>
<tr>
<td>ps29</td>
<td>If my child talks back or complains when I handle a…</td>
<td>7= Most of the time.  1= Never or rarely.</td>
</tr>
<tr>
<td>ps30</td>
<td>If my child gets upset when I say no…</td>
<td>1= I back down and give in to my child. 7= I stick to what I said.</td>
</tr>
</tbody>
</table>
3. Eyberg Child Behavior Inventory

Below are a series of phrases that describe children's behavior. Please choose the response that describes how often the behavior currently occurs with your child, and then indicate whether or not the behavior is currently a problem for you.

Please answer the following questions about your child that is 6 years of age or younger. If you have two or more children age 6 or under, please answer about the oldest of those children.

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>ecbi1a</td>
<td>Dawdles in getting dressed</td>
<td>1= Never</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2= Seldom</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3= Sometimes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4= Often</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5= Always</td>
</tr>
<tr>
<td>ecbi1b</td>
<td><em>Is this a problem for you?</em></td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi2a</td>
<td>Dawdles or lingers at mealtime</td>
<td>1= Never</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2= Seldom</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3= Sometimes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4= Often</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5= Always</td>
</tr>
<tr>
<td>ecbi2b</td>
<td><em>Is this a problem for you?</em></td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi3a</td>
<td>Has poor table manners</td>
<td>1= Never</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2= Seldom</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3= Sometimes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4= Often</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5= Always</td>
</tr>
<tr>
<td>ecbi3b</td>
<td><em>Is this a problem for you?</em></td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi4a</td>
<td>Refuses to eat food presented</td>
<td>1= Never</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2= Seldom</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3= Sometimes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4= Often</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5= Always</td>
</tr>
<tr>
<td>ecbi4b</td>
<td><em>Is this a problem for you?</em></td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi5a</td>
<td>Refuses to do chores when asked</td>
<td>1= Never</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2= Seldom</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3= Sometimes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4= Often</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5= Always</td>
</tr>
<tr>
<td>ecbi5b</td>
<td><em>Is this a problem for you?</em></td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi6a</td>
<td>Slow in getting ready for bed</td>
<td>1= Never</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2= Seldom</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3= Sometimes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4= Often</td>
</tr>
<tr>
<td>Question</td>
<td>Scale</td>
<td>Response</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>ecbi6b: Is this a problem for you?</td>
<td>5= Always</td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi7a: Refuses to go to bed on time</td>
<td>1= Never</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2= Seldom</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3= Sometimes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4= Often</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5= Always</td>
<td></td>
</tr>
<tr>
<td>ecbi7b: Is this a problem for you?</td>
<td>5= Always</td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi8a: Does not obey house rules on own</td>
<td>1= Never</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2= Seldom</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3= Sometimes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4= Often</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5= Always</td>
<td></td>
</tr>
<tr>
<td>ecbi8b: Is this a problem for you?</td>
<td>5= Always</td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi9a: Refuses to obey until threatened with punishment</td>
<td>1= Never</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2= Seldom</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3= Sometimes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4= Often</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5= Always</td>
<td></td>
</tr>
<tr>
<td>ecbi9b: Is this a problem for you?</td>
<td>5= Always</td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi10a: Acts defiant when told to do something</td>
<td>1= Never</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2= Seldom</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3= Sometimes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4= Often</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5= Always</td>
<td></td>
</tr>
<tr>
<td>ecbi10b: Is this a problem for you?</td>
<td>5= Always</td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi11a: Argues with parents about rules</td>
<td>1= Never</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2= Seldom</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3= Sometimes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4= Often</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5= Always</td>
<td></td>
</tr>
<tr>
<td>ecbi11b: Is this a problem for you?</td>
<td>5= Always</td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi12a: Gets angry when doesn’t get own way</td>
<td>1= Never</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2= Seldom</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3= Sometimes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4= Often</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5= Always</td>
<td></td>
</tr>
<tr>
<td>ecbi12b: Is this a problem for you?</td>
<td>5= Always</td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi13a: Has temper tantrums</td>
<td>1= Never</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2= Seldom</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3= Sometimes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4= Often</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5= Always</td>
<td></td>
</tr>
<tr>
<td>ecbi13b: Is this a problem for you?</td>
<td>5= Always</td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi14a: Sasses adults</td>
<td>1= Never</td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Questions</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>ecbi14b</td>
<td>Is this a problem for you?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi15a</td>
<td>Whines</td>
<td></td>
</tr>
<tr>
<td>ecbi15b</td>
<td>Is this a problem for you?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi16a</td>
<td>Cries easily</td>
<td></td>
</tr>
<tr>
<td>ecbi16b</td>
<td>Is this a problem for you?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi17a</td>
<td>Yells or screams</td>
<td></td>
</tr>
<tr>
<td>ecbi17b</td>
<td>Is this a problem for you?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi18a</td>
<td>Hits parents</td>
<td></td>
</tr>
<tr>
<td>ecbi18b</td>
<td>Is this a problem for you?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi19a</td>
<td>Destroys toys and other objects</td>
<td></td>
</tr>
<tr>
<td>ecbi19b</td>
<td>Is this a problem for you?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi20a</td>
<td>Is careless with toys and other objects</td>
<td></td>
</tr>
<tr>
<td>ecbi20b</td>
<td>Is this a problem for you?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi21a</td>
<td>Steals</td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Response Options</td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td><strong>ecbi21b</strong></td>
<td><em>Is this a problem for you?</em></td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi22a</td>
<td>Lies</td>
<td>1= Never, 2= Seldom, 3= Sometimes, 4= Often, 5= Always</td>
</tr>
<tr>
<td><strong>ecbi22b</strong></td>
<td><em>Is this a problem for you?</em></td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi23a</td>
<td>Teases or provokes other children</td>
<td>1= Never, 2= Seldom, 3= Sometimes, 4= Often, 5= Always</td>
</tr>
<tr>
<td><strong>ecbi23b</strong></td>
<td><em>Is this a problem for you?</em></td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi24a</td>
<td>Verbally fights with friends own age</td>
<td>1= Never, 2= Seldom, 3= Sometimes, 4= Often, 5= Always</td>
</tr>
<tr>
<td><strong>ecbi24b</strong></td>
<td><em>Is this a problem for you?</em></td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi25a</td>
<td>Verbally fights with sisters and brothers</td>
<td>1= Never, 2= Seldom, 3= Sometimes, 4= Often, 5= Always</td>
</tr>
<tr>
<td><strong>ecbi25b</strong></td>
<td><em>Is this a problem for you?</em></td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi26a</td>
<td>Physically fights with friends own age</td>
<td>1= Never, 2= Seldom, 3= Sometimes, 4= Often, 5= Always</td>
</tr>
<tr>
<td><strong>ecbi26b</strong></td>
<td><em>Is this a problem for you?</em></td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi27a</td>
<td>Physically fights with sisters and brothers</td>
<td>1= Never, 2= Seldom, 3= Sometimes, 4= Often, 5= Always</td>
</tr>
<tr>
<td><strong>ecbi27b</strong></td>
<td><em>Is this a problem for you?</em></td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi28a</td>
<td>Constantly seeks attention</td>
<td>1= Never, 2= Seldom, 3= Sometimes, 4= Often, 5= Always</td>
</tr>
<tr>
<td><strong>ecbi28b</strong></td>
<td><em>Is this a problem for you?</em></td>
<td>Yes/No</td>
</tr>
<tr>
<td>ecbi29a</td>
<td>Interrupts</td>
<td>1= Never</td>
</tr>
<tr>
<td>ecbi29b</td>
<td>Is this a problem for you?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>----------</td>
<td>----------------------------</td>
<td>--------</td>
</tr>
</tbody>
</table>
| ecbi30a  | Is easily distracted        | 1= Never  
|          |                            | 2= Seldom  
|          |                            | 3= Sometimes  
|          |                            | 4= Often  
|          |                            | 5= Always  |
| ecbi30b  | Is this a problem for you? | Yes/No |
| ecbi31a  | Has short attention span   | 1= Never  
|          |                            | 2= Seldom  
|          |                            | 3= Sometimes  
|          |                            | 4= Often  
|          |                            | 5= Always  |
| ecbi31b  | Is this a problem for you? | Yes/No |
| ecbi32a  | Fails to finish tasks or projects | 1= Never  
|          |                            | 2= Seldom  
|          |                            | 3= Sometimes  
|          |                            | 4= Often  
|          |                            | 5= Always  |
| ecbi32b  | Is this a problem for you? | Yes/No |
| ecbi33a  | Has difficulty entertaining self alone | 1= Never  
|          |                            | 2= Seldom  
|          |                            | 3= Sometimes  
|          |                            | 4= Often  
|          |                            | 5= Always  |
| ecbi33b  | Is this a problem for you? | Yes/No |
| ecbi34a  | Has difficulty concentrating on one thing | 1= Never  
|          |                            | 2= Seldom  
|          |                            | 3= Sometimes  
|          |                            | 4= Often  
|          |                            | 5= Always  |
| ecbi34b  | Is this a problem for you? | Yes/No |
| ecbi35a  | Is overactive or restless  | 1= Never  
|          |                            | 2= Seldom  
|          |                            | 3= Sometimes  
|          |                            | 4= Often  
|          |                            | 5= Always  |
| ecbi35b  | Is this a problem for you? | Yes/No |
| ecbi36a | Wets the bed | 1= Never  
2= Seldom  
3= Sometimes  
4= Often  
5= Always |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ecbi36b</td>
<td><em>Is this a problem for you?</em></td>
<td>Yes/No</td>
</tr>
</tbody>
</table>
APPENDIX C

The iPARENT Coding System: a Manual

May 2013

by

Thailyn López Alonso

John Jay College of Criminal Justice
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PURPOSE

The iPARENT is designed for use as an observational assessment system for assessing the parenting practices of parents with children ages 2-6 years. The iPARENT allows researchers to rate naturalistic observations of parenting behaviors that have been collected through use of the Electronically Activated Recorder application (iEAR; Mehl, Pennebaker, Crow, Dabbs, & Price, 2001). The iEAR is a device that is worn on the participant’s person for a specified time period, and is designed to record the individual’s verbalizations in a naturalistic setting.

DEVELOPMENT

Since the data obtained by the iEAR is acoustic in nature, parenting behavior codes were selected based on empirical findings of parents’ verbal communication and their relation to the development and maintenance of child externalizing behavior problems. Content codes were developed and adapted for this acoustic device from a variety of sources including: (1) extant empirical literature on parenting practices that have been consistently and reliably shown to predict child behavior problems; (2) reliable and valid parent self-report measures, specifically the Parenting Scale (Arnold, O’Leary, Wolff, & Acker, 1993) and the Eyberg Child Behavior Inventory (Robinson, Eyberg, & Ross, 1980); and (3) the most psychometrically well established observational coding system for videotaped parent child interactions, the Dyadic Parent-Child Interaction Coding System (DPICS-R; Eyberg, Nelson, Duke, & Boggs, 2005).

TRANSCRIPTION AND CODING PROCEDURES

a. Transcription of audio files

The iEAR recording for each participant consists of a four-hour span in which two-minute samples are recorded, separated by 10 seconds each, resulting in 111 audio clips for each participant. All iEAR audio files are downloaded onto a single main computer in a locked laboratory space. Every fourth two-minute audio clip is sampled and transcribed by a research assistant (RA) who has completed transcription training. Once the files have been transcribed, they are reviewed by a second transcriber to identify possible errors or omissions. Transcription RAs receive a test of competence for the transcription protocol before beginning to code usable data for the project. Sample transcriptions will be completed with 80% accuracy before the transcription reviewer is permitted to begin work with the usable data files. The protocol for transcription is attached in Appendix B.

The following procedures will ensure that transcription RAs maximize reliability in their transcriptions:

- Maintain, in direct view, a “Follow-up Sheet” for the participant that lists the identity of each person who was at home during the iEAR recording. This document is completed immediately following the recording session by the RA who debriefs the participant at the end of the assessment.

b. Coding the transcribed audio files with iPARENT

After the files have been transcribed and reviewed, research assistants are trained to 80% reliability, at which point, they are ready to begin coding.
The following procedures will ensure that coding RAs maximize reliability in their coding:

- Also in direct view, maintain the coding manual and refer to it continuously when questions arise during the coding if they have any questions.
- If anything is unclear in the coding manual, make a note of it and bring it to the attention of the principal investigator. RA feedback is essential in the refinement and implementation of this coding system.

Spanish-speaking coders will be assigned Spanish-speaking cases. If a coder is assigned a case in which Spanish is spoken and the coder is not fluent in Spanish, s/he must immediately notify the lead researcher.

Each two-minute audio clip is rated on a 5-point Likert scale or a frequency count for each of the behaviors described below. Due to the nature of the observation, conceptual differences between behavior codes, and past research, it was determined that some codes would be best assessed via global ratings and others via frequency counts. A summary of code descriptions and their relative measurement (global rating versus frequency counts) can be found in Appendix A. Coders are to use the transcription AND the audio file simultaneously, to ensure accurate coding of nonverbal cues, such as tone. Coders must refer to the behavioral and language descriptors next to each rating to assist in determining the best rating for each clip. When a behavior does not occur within a given clip, apply one of the following ratings:

- With the exception of Engagement, clips in which there is no parent-child interaction (no speech or clips in which the mother and/or child speak but not to each other) = 99
- Clips in which speech is inaudible/indiscernible (speaking a foreign language that has not be translated in the transcript or speech is too distant to be understood) = 88

In addition to receiving a unique parenting score for each behavior, the variability of individual parenting behaviors between clips will serve as a measure of parental consistency.
PARENTING BEHAVIORS

ENGAGEMENT (E)

Definition

Engagement is defined as the degree of parent involvement with the child. This code assesses the amount, not quality, of overall parent-child interaction(s) and parental responsiveness to the child. Either the parent or the child can initiate the interaction. Negative, neutral, and positive involvements all qualify as engagement.

1. **Negative involvement** (criticisms, name-calling, threats, etc.)
2. **Neutral involvement** (commands, statements, non-fluencies, etc.)
3. **Positive involvement** (terms of endearment, encouragement, praise, playful sounds, etc.)

Rating Guidelines: Global Rating

- Assign one of the following ratings for each audio clip. Lower scores reflect lower levels of parental engagement. Higher scores reflect higher levels of engagement, meaning more parent-child interaction overall.

1. **WHICH OF THE FOLLOWING BEST DESCRIBES THE PARENT’S OVERALL LEVEL OF ENGAGEMENT WITH THE CHILD? ____**

   1 = **Disengagement.** Apply this code if there is no parent-child interaction. Absence of parent-child interactions includes audio samples that are silent throughout and samples in which the parent is only interacting with an individual other than the child (i.e., talking on the phone).

   2 = It is unclear as to whether or not the parent is listening; the parent may be distracted with another task or speaking to another person during the times that the child is attempting to interact. The child makes repeated attempts to obtain the parent’s attention and the parent rarely responds. When the parent does respond, s/he shows little interest in the child (i.e. responses are brief, monosyllabic, and monotone) and quickly returns to what previous task.

   This rating is lower than “3” with regards to the amount of effort the child has to make to obtain the parent’s attention and/or with regards to parent’s frequency of response.

   3 = **Passive Involvement.** The parent responds to most of the child’s calls for attention. However, the parent provides minimal attention and rarely initiates the interaction. The parent rarely tracks or acknowledges the child’s activity or behavior. Verbalizations/interactions with the child are intermittent, brief, unenthusiastic, and
are mostly solicited by the child, rather than generated independent of the child’s efforts obtain the parent’s attention (e.g., “because” “hmm” “yeah” etc.).

This rating is lower than “4” with regards to frequency with which the parent initiates the interaction and duration of response to the child’s attempts to initiate interaction.

4 = The parent is involved and responsive to the child for the most part but there may be moments when she briefly disengages and then resumes active involvement soon thereafter. The parent initiates the interaction sometimes but may be distracted with another task or person.

This rating is lower than “5” with regards to frequency, intensity, and duration of engagement.

5 = Active Involvement. The parent is fully immersed in activity/conversation with her child. She responds to most, if not all, of her child’s calls for attention, comments on the child’s activities, and displays interest in the outcome of the child’s activities. The parent frequently initiates the interaction and there is a high frequency of parent-child verbalizations in the audio sample. This high level of engagement can include positive, neutral, or negative verbalizations.

Examples

Child calls out, “Mommy?” and mother never responds. (Code 1)


Child says, “Look at this, look at this mommy” and there is no response.

Child calls out again, “Mommy look,” no response.

Again, child says, “Look mommy!” and mother responds, “Hm.” (Code 2)

Child calls out, “Mommy look!” and mother immediately responds (within 3 seconds) “Oh my goodness, what a beautiful drawing! You are such a good artist!” (Code 5)

“Joey, get down from there right now, that’s dangerous!” (Code 5)

***Remember that interactions can be negative, neutral, or positive.
PARENT AFFECT (ParA)

Definition

Parent Affect is defined as the emotional quality of the parent’s verbalizations. It is coded on the basis of tone of voice and/or inflections. Two scales are used to code the affect demonstrated by the parent in each audio sample: Degree of positive affect and degree of negative affect.

1. **Positive Affect:** the parent’s positive evaluative expression of pleasure, warmth, enthusiasm, or gratitude. Laughter is also coded as Positive Affect.

2. **Negative Affect:** the parent’s negative evaluative expression of unhappiness, disapproval, anger, or hostility. Screaming, yelling, or crying is coded as Negative Affect.

Rating Guidelines: Global Rating

- Within each audio sample, rate overall level of Positive and Negative Affect demonstrated by the parent’s audible behaviors.
- Only code parent affect that is demonstrated in interactions between the parent and the target child.
- Higher scores reflect higher levels of intensity and frequency of Positive and Negative Affect. Lower scores reflect lower intensity and frequency.
- When assigning an affect rating, take into account the intensity of enthusiasm or anger in the parent’s voice, as this will help you assign a rating. Intensity may be expressed by loudness, duration, or voice intonation.

Decision Rule(s)

a. If parent affect shifts within a given audio clip, choose the rating that best reflects the dominant affective state.

b. If the parent begins laughing or giggling uncontrollably, automatically code a Positive Affect rating of “5.”

c. If a parent screams, yells, or curses at the child, automatically code a Negative Affect rating of “5.”

1. WHICH OF THE FOLLOWING BEST DESCRIBES THE PARENT’S OVERALL POSITIVE AFFECT WHEN INTERACTING WITH THE CHILD? ____

   1 = Parent displays no positive affect. This code is applied when there is no positive affect demonstrated throughout an entire clip. This may occur when the parent displays only negative affect or when all affect is of a neutral valence.

   2 = Parent displays little positive affect. When s/he does, positive evaluative expressions are mostly stated in a neutral tone. This is different from “1” in that the parent makes positive evaluative statements about the child (e.g., “Great job with your homework”) but their tone is flat most of the time, not all of the time.
Neutral affect is typical of general conversations between family and friends. Only slight fluctuations in affect (from neutral to positive) are given this rating. When a person is animated or energetic but not clearly in a positive or negative way, code “2.”

3 = Parent sometimes displays positive affect and is occasionally enthusiastic when doing so. Parent’s tone of voice leans towards pleased and happy in about half of all interactions.

Example descriptors: calm, mild, cordial, polite

4 = Parent displays several instances of positive affect (more than half of all interactions). Positive evaluative expressions are mostly stated in an enthusiastic tone. The parent demonstrates notable warmth, interest, pleasure, supportiveness or affection. Behavior is expressed with laughter, affection and/or enthusiastic interest.

Example descriptors: warm, affectionate, enthused, interested, lively, happy, approving, encouraging, solicitous, playful

5 = Parent frequently and intensely displays marked expressions of intense happiness, warmth, affection, pleasure, and/or supportiveness.

The difference between “4” and “5” is that “5” indicates more intense expressions of positive affect that are unmistakably pleasurable and are less controlled. Intensity may be expressed by loudness, length of words, and intensity of voice intonation.

Example descriptors: overjoyed, exhilarated, rejoicing, loving, excited, enthusiastic, bursting with laughter

2. WHICH OF THE FOLLOWING BEST DESCRIBES THE PARENT’S OVERALL NEGATIVE AFFECT WHEN INTERACTING WITH THE CHILD? ___

1 = Parent displays no negative affect. This code is applied when there is no negative affect demonstrated throughout an entire clip. This may occur when the parent displays only positive affect or when all affect is of a neutral valence.

2 = Parent displays little negative affect. When s/he does, negative evaluative expressions are mostly stated in a neutral tone. This is different from “1” in that the parent makes negative evaluative statements about the child (e.g., “Stop being bad”) but their tone is flat most of the time, not all of the time.

Only slight fluctuations in affect (from neutral to negative) are given this rating. When a person is upset or stern but not clearly in a positive or negative way, code “2.”

3 = Parent sometimes displays negative affect. Parent’s tone of voice is irritable in about half of all interactions.
Example descriptors: stressed, irritable, annoyed

4 = Parent displays several instances of negative affect (more than half of all interactions). The parent’s tone of voice indicates mild displeasure, irritation, sadness, contempt, slight hostility and/or mild disapproval. Tone of voice is less extreme than “5.”

Example descriptors: complaining, cold, dismissive, somber, curt, rejecting, defensive, bitter, unhappy, quarrelsome, contemptuous, exasperating, teasing, menacing, bossy

5 = The parent frequently and intensely displays marked expressions of clear and pronounced anger, disapproval, displeasure, or demeaning affect. Tone of voice is loud, harsh, tense, threatening, angry, provocative, extremely sad, depressed, or very unhappy. If you can hear evidence of physical punishment, automatically apply this code.

Example descriptors: abusive, belligerent, clearly disapproving, angry, enraged, vindictive, taunting, defeated, hostile, guilt-tripping, violent, tantrums, screaming
PRAISE (P)

Definition

Praise is a verbalization, containing one or more positive evaluative words or phrases that express a favorable judgment on an activity, product, or attribute of the child. Praise can be delivered in the form of a statement or a question. There are two kinds of praises, Unlabeled and Labeled.

1. **Unlabeled Praise (UP)** – a nonspecific verbalization that expresses a favorable judgment on an activity, product, or attribute of the child. Unlabeled Praises do not specifically state what activity, product, or attribute of the child is being praised. It does not explicitly indicate to the child what can be done again to obtain a similar praise.

   - “Great!”
   - “Excellent.”
   - “Thanks!”
   - “You’re right”
   - “Good job!”
   - “Awesome, honey!”
   - “You’re so funny.”
   - “You’re smart.”
   - “You’re the best.”
   - “I love you.”
   - “I appreciate that.”
   - “Congratulations!”

   A positive metaphor or term of endearment referring to the child is Unlabeled Praise.

   - “You’re my little helper.”
   - “What a sweetheart!”
   - “You’re a silly goose.”

   Encouraging remarks are Unlabeled Praise.

   - “You can do it!”
   - “You’re almost done.”
   - “There you go!”

2. **Labeled Praise (LP)** – a specific verbalization that expresses a favorable judgment upon an activity, product, or attribute of the child. Labeled Praises are specifically state what activity, product, or attribute of the child is being praised. It explicitly indicates to the child what can be done again to receive a similar praise.

   - “You sing so well.”
   - “You have a beautiful smile.”
   - “Thank you for handing me the box.”
   - “You’re a good builder!”
   - “Thanks for putting that back on the shelf.”
   - “It’s awesome that you know all your letters!”
   - “You’re coloring is beautiful.”
   - “I like the way you sit so quietly”
   - “You drew a lovely flower, didn’t you?”
   - “You’re a good boy for finishing your homework.”

If the child asks for praise and the parent obliges, it is coded as praise.
“Did I do a good job?” --- “You did do a good job!” (UP)
“Did I do a good job?” --- “You did do a good job stacking the blocks!” (LP)

Rating Guidelines: Frequency Count

→ For each audio clip, count the number of Unlabeled Praises and the number of Labeled Praises given by a parent to the child.

1. HOW MANY UNLABELED PRAISES? ____
2. HOW MANY LABELED PRAISES? ____

Decision Rule(s)

→ If unsure as to whether the praise is Labeled or Unlabeled, code Unlabeled.

Examples

“Cool.” (UP)
“You’re smart!” (UP)
“Wow! Look at you go!” (UP + UP)
“You are writing your numbers carefully.” (LP)
“Good idea. You’re smart for gathering up the blocks first.” (LP + LP)
“Thanks for putting that back on the shelf. You’re the best.” (LP + UP)
“It’s nice how you hold her so gently.” (LP)
COMMANDS (COM)

Definition

The Commands code refers to the adequacy of the instructions that a parent provides the child when requesting a behavior change. There are two types of commands, Direct and Indirect.

1. **Direct Commands (DC)** – clearly stated orders that specifically indicate to the child the expected behavior change.

   - “Tell me.”
   - “Let’s go.”
   - “Come here.”
   - “Go to bed.”
   - “Please tie your shoes.”
   - “Show me your smile.”
   - “Please put the blocks in the bucket.”
   - “Give me your hand.”

2. **Indirect Commands (IC)** – vaguely stated orders requesting/suggesting a behavior change. They are implied, nonspecific, or stated in question form.

   - “Joey!”
   - “Wait.”
   - “Listen.”
   - “Calm down.”
   - “Be careful.”
   - “Will you sit down?”
   - “Can you give it to me?”
   - “Would you mind getting your shoes?”

A statement indicating the parent’s preference for a behavior is also considered an Indirect Command. These statements usually begin with “I…” These types of indirect commands differ from Coaxing in that they are delivered in a firm tone of voice whereas coaxes involve a begging and pleading quality that is identifiable in pitch and sound stretching (i.e., “Pleeeeeease…” see p. 18 for additional explanation).

   - “I would like you to eat your peas.”
   - “It would be nice if you picked up your toys.”
   - “I need you to hold my hand.”

Commands should be positive in nature in that they should tell the child what to do instead of what not to do. Commands that tell the child what not to do are considered Negative Talk (NegT; see p. 15 for additional explanation).

   - “Sit quietly in your chair” (DC) vs. “Stop running around.” (NegT)
   - “Please keep your food on your plate” (DC) vs. “Stop that right now!” (NegT)
   - “Put your toys in the box” (DC) vs. “Don’t make a mess” (NegT)

**Rating Guidelines: Frequency Count**

- For each audio clip, count the number of Direct Commands and the number of Indirect Commands given by a parent to their child.

1. **HOW MANY DIRECT COMMANDS? ____**
2. HOW MANY INDIRECT COMMANDS? ____

Decision Rule(s)

a. If unsure as to whether the command is Direct or Indirect, code Indirect.

Examples

“Be careful! Give me your hand.” (IC + DC)
“Stop yelling. Use your inside voice.” (NegT + DC)
NEUTRAL TALK (NeuT)

**Definition**

Neutral Talk is comprised of statements that introduce information about people, objects, events, or activities, or indicate attention to the child, but do not clearly evaluate the child or the child’s activities, products, attributes, or choices. Neutral Talk contains no praise or criticism of the child's products or activities. It does not contain orders or demands.

“It’s over there.”
“I’m feeling tired too.”
“It's your turn to choose the game.”
“The dolly is going to sleep.”
“That's a tall tower you're making.”

“You seem to be feeling very happy today.
“All you have to do is hold it steady like this.”
“Apples are my favorite fruit.”
“I'm making my rainbow just like yours.”

Noncritical statements that describe what the child is not doing are coded as Neutral Talk

“You’re not drawing yellow flowers today”
“You’re not using the purple crayon.”

Statements about future behaviors are Neutral Talk when they describe what will likely happen to the child in the future. They are commands when they directly instruct the child to perform a future behavior. Statements about future behaviors that are considered warnings or threats are coded as Negative Talk.

“Tomorrow you get to visit Grandma.” (NeuT)
“Tomorrow you have to visit Grandma.” (DC)
“You are not going to have any dinner if you keep acting this way.” (NegT)
“We are not going to the park tomorrow because you were bad.” (NegT)

A negatively worded statement (i.e., tells the child what not to do) that describes a rule about appropriate behavior in general and that does not criticize the child's ongoing or immediately completed behavior is coded Neutral Talk. If the statement is referring to the child’s ongoing behavior, it is coded as Negative Talk.

Child says, “Joey called his mom a witch” and parent responds, “Children aren't supposed to call their parents names.” (NeuT)

Child says, “You're a witch” and parent responds, “Children aren't supposed to call their parents names.” (NegT)

**Rating Guidelines: Frequency Count**

- Within each audio sample, count the number of times a parent uses Neutral Talk.
- One instance of Neutral Talk is equivalent to one conceptually self-contained thought (i.e., one remark/phrase or sentence)
Child asks, “What is the alphabet?”
  Parent responds, “A, B, C, D.” (NeuT x1)
  ➢ Neutral Talk that is separated by a pause of 2 seconds or more is coded as a separate instance of Neutral Talk.
  ○ A, B, C (2 sec. pause) D, E, F, G. (NeuT x2)
  ➢ When Neutral Talk is stated sarcastically, code Negative Talk. Also, take sarcasm into consideration for rating Parent Affect (see p. 7)

1. HOW MANY INSTANCES OF NEUTRAL TALK? ___

Decision Rule(s)

a. When uncertain as to whether the verbalization is Neutral Talk or another type of verbalization, code Neutral Talk.

b. When uncertain whether Neutral Talk words strung together are one sentence or separate sentences, code one sentence.
NEGATIVE TALK (NegT)

Definition

Negative Talk is a verbal expression of disapproval (i.e., direct or implied negative evaluation) of the child or the child's attributes, activities, products, or choices. Negative Talk consists of sassy, sarcastic, rude, or impudent speech (i.e., threats, criticisms, name calling, swearing, etc.). Negative Talk receives frequency counts and a global rating (see both rating guidelines below).

“You're being naughty.”
“You're cheating.”  (parent whines)
“Clean up the mess you made.”
“You can’t do that”
“You put it in the wrong place.”
“That's not red.”
“What do you think you're doing?”
“What’s with you today?”
“You're working too slowly.”
“You are a spoiled brat!”
“That's a messy picture.”
“That was smart.”  (said sarcastically)
“That's crooked.”
“Shut up!”
“Bad, bad, bad.”
“I don’t give a damn.”
“No.”  (following a child’s request)
“You're going to get whooped.”
“Go ahead and do it!”
“Put it down or else!”
“Boy you sure made a big mess.”
“If you don’t share, then we will just have to leave you here.”
“I just can’t believe it.”  (blaming and accusatory)

For purposes of this coding system, Negative Talk is coded as Direct and Indirect

1. Direct Negative Talk (DNegT) – Negative Talk that is specifically directed at the child.

2. Indirect Negative Talk (INegT) – Negative Talk about the child that is directed at someone other that the child, such as when the parent is talking on the telephone or with another individual in the home.

“I’m going to slap some sense into you.”  vs.  “I’m going to slap some sense into him.”
“Joey, what did I say!”  vs.  “He never listens to me.”
“Jennifer Michelle Jones, don’t you dare.”  vs.  “She’s drives me crazy sometimes.”
“How dare you!”  vs.  “He’s wild, just like his daddy.”
“This is all your fault.”  vs.  “He’s messing it up.”

A command that tells the child what not to do is Negative Talk.

“Will you stop whining?”
“Stop that.”

Correcting the child's behavior by highlighting what the child has done wrong is Negative Talk, even if communicated in a playful tone.

“That’s the wrong answer.”
“That's not quite right sweetie.”
“You’re not using the right colors.”

Rating Guidelines (1 of 2): Frequency Count

- Within each audio sample, count the number of times a parent uses negative talk.
- One instance of negative talk is equivalent to one conceptually self-contained thought (i.e., one remark/phrase or sentence).
  - The same single critical word repeated with no pause is coded as one instance of Negative Talk (i.e., “Bad, bad, bad” or “No, no, no”).

Decision Rule(s)

a) When unsure as to whether a statement is Negative Talk or Neutral Talk, code Neutral Talk.

1. HOW MANY INSTANCES OF DIRECT NEGATIVE TALK? __________
2. HOW MANY INSTANCES OF INDIRECT NEGATIVE TALK? __________

Rating Guidelines (2 of 2): Frequency Count

- Rate the overall level of harshness in Negative Talk and when doing so, take degree of the following into account:
  - Parent’s reliance on the use of blame, guilt-induction, criticisms, threats, and punitiveness in directive statements to back up efforts to obtain the child’s compliance
  - Displeasure, impatience, irritability, disapproval, and/or intolerance of the child
  - Accusatory, hostile, tense, disgusted, or angry tone of voice.

- Lower ratings are reflected by mild to moderate bossiness, impatience, guilt, or blaming. Higher ratings are reflected by a more threatening, harsh, or punitive stance and may reflect a parent’s reliance on their position of power for power’s sake, rather than their use of an explanation of reasonable rationales. At higher levels, the parent is likely to entertain arguments with the child.

3. WHICH OF THE FOLLOWING BEST DESCRIBES THE OVERALL LEVEL OF HARSHNESS EXHIBITED BY THE PARENT’S NEGATIVE TALK? ______

1 = Not Harsh. Parent does not use any negative talk in this clip.

2 = Slightly Harsh. The parent’s talk is playful in nature but is nonetheless negative talk. The parent does not threaten or humiliate the child or his/her attributes.

Ex: “You’re using the wrong colors honey” (although this is considered a criticism, the comment is delivered in a pleasant tone that others may not perceive as harsh had they not read the instructions for this code.)
3 = Moderately Harsh. The parent communicates with the child in a bossy, impatient, and blaming manner. The parent demonstrates some negative affect (i.e., irritable, snappy, and somewhat intolerant of the child).

4 = Harsh. The parent communicates disapproval and uses threatening directives for specific behavior change in the immediate future. The parent often uses coerciveness to gain short-term compliance. The parent’s tone is threatening, angry, and highly critical of the child.

5 = Very Harsh. The parent humiliates or severely criticizes the child. The parent’s tone is angry and threatening. The parent may get into long arguments with the child. It may seem that the parent is relying on their position of power for power’s sake, rather than using reasonable rationales. If the parent uses audible physical force or swears at the child, automatically apply this rating.

Examples

“That’s not quite right sweetie.” (Code 1)
“You’re being slow.” (Code 2)
“Don’t you ever learn? [Sigh] You’ll get it eventually.” (Code 2)
“Pick up your toys right now or wait and see what happens.” (Code 3)
“Stop being so stupid.” (Code 4)
“Goddammit Joey!” (Code 4)
COAXING (COA)

Definition
Coaxing is defined as a parent’s attempt to obtain the child’s compliance by begging, pleading, or bargaining. Coaxing differs from incentivizing the child in that coaxing involves a whining tone (identifiable in pitch and sound stretching) indicative of exasperation, defeat, and lack of control.

“Please stop crying Joey.”
“I’ll buy you an ice cream if you stop jumping.”
“Will you be nice if I give you your juice?”
“I’ll give you a dollar if you be quiet.”

The parent may also request or express a preference for the child’s compliance rather than demand it.

“I neeeeed you to listen” vs. “Listen to me” (DC)
“I would like you to be nice to your sister” vs. “Share your teddy with your sister” (DC)

Threatening is different from Coaxing and should not be coded as Coaxing. Threats should be coded as Negative Talk. A threat has a consequence that is clearly negative for the child and is harsher that Coaxing. See some examples of threats below:

“If you don’t stop messing around, I’ll eat your dessert”
“Behave or you’ll get spanked.”
“I swear to God, I’ll break that toy if you don’t stop being so loud.”

Rating Guidelines: Frequency Count

- Within each audio sample, count the number of times that a parent coaxes the child.

1. HOW MANY INSTANCES OF COAXING? __

Decision Rule(s)

a. If unsure whether the parent is coaxing or threatening the child, code threat (NegT).
LENIENCE (L)

Definition

Lenience is defined as the parent’s level of permissiveness in regards to obvious child misbehavior. For purposes of this coding system, child misbehavior is obvious in quality (e.g., saying “no” in response to a parent command, crying, whining, screaming, yelling, swearing, and talking back) and intensity (loudness, duration).

All of the following qualify as parental Lenience:

1. **Lack of response** to child misbehavior (within 5 seconds of occurrence). The lack of response implies a lack of awareness or concern for misbehavior.

2. Parent **backs down** if initial attempt to address child misbehavior is ineffective or if child does not comply with a command (e.g., parent may have already asked the child to cease the disruptive behavior but does not ask again if the misbehavior persists, parent backs down if child says, “no”).

3. Parent **does not follow through** with warnings or threats (e.g., parent tells the child s/he will have to go to time out if they aren’t quiet, child continues to be noisy, parent never tells the child to go to time out).

Rating Guidelines: Frequency Count

- Within each audio sample, count the number of times that a parent exhibits Lenience as defined above (Lack of response/Backs down/Doesn’t follow through).

1. HOW MANY INSTANCES OF LENIENCE? ____
CHILD BEHAVIORS

ENGAGEMENT (E)

Definition

Engagement is defined as the degree of child involvement with the parent. This code assesses the amount, not quality, of overall interaction(s). This code also assesses the child’s responsiveness and attempts to initiate an interaction with their parent. Either the parent or the child can initiate the interaction. Negative, neutral, and positive involvements all qualify as engagement.

4. **Negative involvement** (criticisms, name-calling, threats, etc.)
5. **Neutral involvement** (commands, statements, non-fluencies, etc.)
6. **Positive involvement** (terms of endearment, encouragement, praise, playful sounds, etc.)

Rating Guidelines: Global Rating

- Assign one of the following ratings for each audio clip. Lower scores reflect lower levels of engagement. Higher scores reflect higher levels of engagement, meaning more parent-child interaction overall.

1. **WHICH OF THE FOLLOWING BEST DESCRIBES THE CHILD’S OVERALL LEVEL OF ENGAGEMENT WITH THE PARENT? ____**

1 = **Disengagement.** Apply this code if there is no parent-child interaction. Absence of parent-child interactions includes audio samples that are silent throughout and samples in which the child is only interacting with an individual other than his/her parent (i.e., talking to self, talking to grandmother).

2 = It is unclear as to whether or not the child is listening. The child may be ignoring the parent or may be distracted with another task or speaking to another person during the times that the parent is attempting to interact. The parent makes repeated attempts to obtain the child’s attention and the child rarely responds. When the child does respond, s/he shows little interest in the parent (i.e. responses are brief, monosyllabic, and monotone) and quickly returns to what previous task.

This rating is lower than “3” with regards to the amount of effort the parent has to make to obtain the child’s attention and/or with regards to child’s frequency of response.

3 = **Passive Involvement.** The child responds to most of the parent’s calls for attention. However, the child provides minimal attention and rarely initiates the interaction. The child rarely tracks or acknowledges the parent’s activity or behavior. Verbalizations/interactions with the parent are intermittent, brief, unenthusiastic, and
are mostly solicited by the parent, rather than generated independent of the parent’s efforts obtain the child’s attention (e.g., “because” “hmm” “yeah” etc.).

This rating is lower than “4” with regards to frequency with which the child initiates the interaction and duration of response to the parent’s attempts to initiate interaction.

4 = The child is involved and responsive to the parent for the most part but there may be moments when s/he briefly disengages and then resumes active involvement soon thereafter. The child initiates the interaction sometimes but may be distracted with another task or person.

This rating is lower than “5” with regards to frequency, intensity, and duration of engagement.

5 = Active Involvement. The child is fully immersed in activity/conversation with his/her parent. The child responds to most, if not all, of his/her parent’s calls for attention, comments on the parent’s activities, and displays interest in the outcome of the parent’s activities. The child frequently initiates the interaction (seeks out the parent) and there is a high frequency of parent-child verbalizations in the audio sample. This high level of engagement can include positive, neutral, or negative verbalizations.

Examples

Parent calls out, “Joey?” and the child never responds. (Code 1)

Parent says, “Whoa! Look at this Joey!” and there is no response.
Parent calls out again, “Joey look!” no response.
Again, parent says, “Joey! I asked you to look at this,” and child responds, “Hm.” (Code 2)

Parent calls out, “Joey pick up your toys” child immediately responds, “Why is this blue?” and parent replies, “Did you hear me? Pick up your toys” and child immediately responds (within 3 seconds), “Ok mommy.” (Code 4)

Parent calls out, “Joseph! Stop playing with your food!” and child immediately responds (within 3 seconds) “I don’t want to eat this yucky food. You’re mean! I’m not your friend.” (Code 5)

“Wow! Mommy look at that truck! Did you see it? Did you see it? Look!” (Code 5)

***Remember that interactions can be negative, neutral, or positive.
NON/COMPLIANCE (C/NC/NO)

Definition

Noncompliance is defined as the child’s failure to obey a parent’s direct or indirect command within 5-seconds of being given that command. Examples of noncompliance include ignoring and/or refusing the parent’s command (e.g., “No”).

The following two assumptions must be met for noncompliance to be coded:

1. The parent must give the child the opportunity to comply. This means that the parent does not take over for the child and does not repeat the command within 5-seconds after having given it.

2. Commands are clear and specific enough for the child to understand what is expected (Direct Commands), vague commands make the expectation ambiguous.

Compliance is defined as the child obeying a parent’s Direct Command within 5-seconds of being given that command.

Rating Guidelines: Frequency Count

- If the parent interrupts the 5-second time-period immediately following a command, do not code non/compliance. Instead, count the number of times that the parent provides no opportunity for the child to comply.
- Within each audio sample, count the number of times that a child: (1) complies, (2) does not comply, and (3) is given no opportunity.

1. HOW MANY INSTANCES OF COMPLIANCE (C)? _____
2. HOW MANY INSTANCES OF NONCOMPLIANCE (NC)? _____
3. HOW MANY INSTANCES OF NO OPPORTUNITY (NO)? _____
BACKTALK (BT)

Definition

Backtalk is impudent or disrespectful speech including: arguing, refusing, counter commanding, criticizing the parent, verbally threatening the parent, and swearing. Frequency of backtalk is taken into account.

“So!”
“You dummy!”
“No!” (following a parent’s command)
“What will you give me if I do it?”
“It’s not fair!”
“Put it away yourself!”
“I hate you!”
“You are fat and ugly!”
“You can’t make me.”
“You are a doodie head!”
“You’re mean.”

Rating Guidelines: Frequency Count

- Within each audio sample, count the number of times that a child talks back.
- One instance of backtalk is one phrase or sentence said by the child including: refusals, counter commands, criticisms, threats, or swears.

1. HOW MANY TIMES DOES THE CHILD TALK BACK? ___
CRY/WHINE/YELL (CWY)

**Definition**

A Cry/Whine/Yell is considered a general deviance. In order to qualify as a Cry/Whine/Yell, the child’s behavior must match at least one the following descriptions.

1. **Cry** - inarticulate verbalizations of distress (audible weeping) at or below the loudness of a typical conversation.

2. **Whine** - words uttered by the child in a slurring, nasal, high-pitched voice. The voice quality of the word or phrase is the primary distinguishing element for coding whine.

3. **Yell** - a loud screech, scream, shout or loud crying. The sound must be loud enough so that it is clearly above the intensity of a typical indoor conversation and loud enough to distract others.

**Rating Guidelines: Frequency Count**

- Within each audio sample, count the number of times that a child talks cry/whine/yells.
- A cry/whine/yell is coded at its inception at 5-second intervals throughout its duration. A two-second pause in between cries, whines, and yells means that the behavior has subsided and begun again.
- Simultaneous crying, whining, or yelling occurring within a 5-second interval counts as one cry/whine/yell

1. **HOW MANY CRY/WHINE/YELLS? ____

**Decision Rule(s)**

a. If it is unclear as to whether you should code backtalk or cry/whine/yell, code backtalk.

**Examples**

Child cries for 5 seconds, stops crying for 3 seconds, and then whines. (CWY x2)

“I don’t like this anymore.” (in a nasal high-pitched voice, CWY x1)

“I hate you.” (BT)
POSITIVE AFFECT (PosA)

Definition

Positive Affect is defined as the child’s positive evaluative expression of pleasure, warmth, enthusiasm, or gratitude, including praise of self or parent. Laughter is also coded as Positive Affect.

“This is fun!”
“I have a good idea.”
“I’m good at singing.”
“I’m getting better at reading.”
“You’re funny mommy!”
“Yummy dinner.”
“Yours looks cool.”
“I love you Mommy.”
“You’re welcome.”
“I’m good at this right?”
“Thank you!”
“I’m so excited
Rating Guidelines: Frequency Count

- Within each audio sample, rate overall level of Positive Affect demonstrated by the child’s audible behaviors.
- When assigning a Positive Affect rating, take into account the intensity of enthusiasm in the child’s voice, as this will help you assign a rating. Intensity may be expressed by loudness, duration, or voice intonation. If the child begins laughing or giggling uncontrollably, automatically code a “5.”
- Higher scores reflect higher levels of intensity and frequency of Positive Affect. Lower scores reflect lower intensity and frequency.

1. WHICH OF THE FOLLOWING BEST DESCRIBES THE CHILD’S OVERALL LEVEL OF POSITIVE AFFECT? ____

1 = The child displays no positive affect. This does not mean that the child only demonstrates negative affect (although it could); it is merely an absence of positive affect.

2 = The child displays little positive affect. When s/he does, positive evaluative expressions are mostly stated in a neutral tone.

3 = The child sometimes displays positive affect and is occasionally enthusiastic when doing so.

4 = The child displays several instances of positive affect. Positive evaluative expressions are mostly stated in an enthusiastic.

5 = The child frequently and intensely displays positive affect. The child is frequently exuberant (listen for tone).
REFERENCES


### APPENDIX A

#### iPARENT Code Summary

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parent Behaviors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engagement</td>
<td>This code assesses amount, not quality, of parent-child interaction and the parent’s responsiveness to the child.</td>
<td>GR*</td>
</tr>
<tr>
<td>Parent Affect • Positive • Negative</td>
<td>The emotional quality of the parent’s audible behaviors. Coded on the basis of tone of voice and/or inflections. Two kinds: Degree of Positive Affect and degree of Negative Affect.</td>
<td>GR</td>
</tr>
<tr>
<td>Praise • Labeled • Unlabeled</td>
<td>Positive evaluative words/phrases that express a favorable judgment on an activity/product/attribute of the child. Two kinds: Labeled Praise and Unlabeled Praise.</td>
<td></td>
</tr>
<tr>
<td>Commands • Direct • Indirect</td>
<td>This code assesses the adequacy of instructions a parent provides their child when requesting a behavior change. Two types: Direct Commands and Indirect Commands.</td>
<td>FC*</td>
</tr>
<tr>
<td>Neutral Talk</td>
<td>Statements that introduce information about people, objects, events, or activities, or indicate attention to the child. Does not clearly evaluate the child or the child’s activities, products, attributes, or choices. Contains no orders, demands, praise, or criticism of the child's products or activities.</td>
<td>FC</td>
</tr>
<tr>
<td>Negative Talk • Direct • Indirect • Harshness</td>
<td>Verbal expression of disapproval (i.e., direct or implied) of the child or the child's attributes, activities, products, or choices including sassy, sarcastic, rude, or impudent speech (i.e., threats, criticisms, name calling, swearing, etc.). A frequency count, of Direct and Indirect Negative Talk (e.g., negative talk directed at the child versus speaking negatively about the child to another person), and a global rating of harshness is obtained.</td>
<td>FC &amp; GR</td>
</tr>
<tr>
<td>Coaxing</td>
<td>A parent’s attempt to obtain a child’s compliance by begging, pleading, or offering a reward.</td>
<td>FC</td>
</tr>
<tr>
<td>Lenience</td>
<td>Lack of response to child misbehavior that is obvious in quality (screaming, back talking) and intensity (loudness, duration).</td>
<td>FC</td>
</tr>
<tr>
<td><strong>Child Behaviors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engagement</td>
<td>This code assesses amount, not quality, of parent-child interaction and the child’s responsiveness to their parent and their attempts to engage their parent.</td>
<td>GR</td>
</tr>
<tr>
<td>Noncompliance</td>
<td>Child’s failure to obey a parent’s direct or indirect command within 5 seconds. This code assesses frequency of Compliance, Noncompliance, and No Opportunity.</td>
<td>FC</td>
</tr>
<tr>
<td>Backtalk</td>
<td>Impudent or disrespectful speech including: arguing, refusing, counter commanding, criticizing the parent, verbally threatening the parent, and swearing.</td>
<td>FC</td>
</tr>
<tr>
<td>Cry/whine/yell</td>
<td>A cry, whine, or yell is considered a general deviance. See p. 22 for complete description</td>
<td>FC</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>The child’s positive evaluative expression of pleasure, warmth,</td>
<td>GR</td>
</tr>
</tbody>
</table>
enthusiasm, or gratitude, including praise of self or parent.

*GR = Global Rating, *FC = Frequency Count; Between clip variability of individual codes will serve as a measure of consistency.
APPENDIX B

Transcription Guidelines & Tips
(Internal document, created by Heather Knous-Westfall, M.A.)

1. It is important to put in place markers for words you are unclear about and things the child is uttering, or we won’t know by looking at the transcript whether or not there was any interaction. If you just can’t understand what the word or phrase is, just do your best to estimate how many separate words were spoken and put xxx xxx xxx place markers for each one. This includes utterances by the child that may sound like gibberish or baby talk. Please do not leave entire passages blank, just try your best to estimate how many place markers to put in there (one set of xxx per each unknown word).

2. We are only transcribing for ONE child, and that would be the OLDEST one under 6 years old (phase 2), or the oldest one between ages 2-6 (phase 3). If there are multiple children in the audio files, you MUST obtain information about the study child to ensure the correct child is transcribed either by asking me, and/or looking at the follow-up form.

3. Always check the data dictionary document if unsure of something. A few examples:
   a. Daddy, papa, and dada are not in there, so we have to change these all to “dad.”
   b. It’s either “oclock” or “o’clock” there can’t be a space in there.
   c. Some words you might not expect to be there, like “gonna,” are in fact there. Note, in this case, we are not following the document given to us by the other experimental team. We are leaving words like gonna, wanna, gotcha as is as they ARE in the data dictionary. However, co, cos, and ‘cause have to be changed to “because” and “gotta” should be changed to “got to.”
   d. The word can not has to be typed as “cannot.”

4. Times and Numbers
   a. The only time we can put a number is if it is referring to a time. So if they say they are going to a movie at 8. You can put “I am going to a movie at 8pm” or “I am going to a movie at 8:00pm.” There’s can’t be a space between the number and the am or pm.
   b. If the person specifically says 8 o’clock, you would then write “I am going to a movie at eight o’clock.”
   c. If the child is counting numbers, you have to write them out and same thing if the mother is saying an address.

5. Fillers
   a. Don’t forget to do a search for the words “like,” “well,” “I mean,” “oh well,” “I don’t know,” “ya know,” and “you know.” IF they are used as fillers (some examples are
given later), they need to be changed to “rrlike,” “rrwell,” “imean,” “ohwell,” “idontknow,” “yaknow,” and “youknow,” respectively.

6. Non-Fluencies
   a. DO NOT FORGET to change all “OH” or “AH” to “UH.” Also keep in mind that if the mom says “oh well” that is a filler and the oh stays, but it changes to “ohwell.”
   b. Hm, hmm, um, umm, are all okay.
   c. Uh-uh and uh-huh need to be changed to “no” and “yes.”
   d. Huh? Should be changed to “what?”

7. Nonsense words
   a. You may run into a child who is potty training. If they use words like doodoo or caca, the word “poop” IS in the dictionary so you can change those to that.
   b. Be careful about writing out singing because one of the words may be an actual word. If the mom sings “le de da do de” for example, “do” is a real word and it will get counted incorrectly. In this instance, I would change the do to “doo” so it’s nonsense.
   c. Made up words that are close to real words should be changed to the real word, for example, bestest changed to best. Just make a note of this in the appendix.
   d. If something is read from a book but is nonsense, leave as is. For example, the word “gimmies.”
   e. Also, if the person is singing or saying something weird like “boom chicka boom” leave this as is and it will just be coded as nonsense.
   f. The words ow, ouch, and yo are not in the dictionary, but leave those in there as is.
   g. If the person swears, those words are in the data dictionary (at least most are), and need to be written as is.

8. Sleep
   a. If it is clear that the child was sleeping for an HOUR OR MORE during the recording, please make a note of this in the appendix. We may later go back and transcribe more files from the portions when the child was not asleep.

9. The Appendix
   a. Put anything here that will help us understand the data.
   b. If you changed words, note that here.
   c. For those who translate, make sure to note any issues with translation or changed words here.
   d. Note unusual sleep issues here.
   e. Note any issues with the iEAR here, i.e., iEAR was removed, etc.

10. Punctuation is not necessary, but you are more than welcome to put it in there.
11. Examples of things people seem to have trouble with:
   a. Stuttering:
      i. The mom says, "Hello, hello, are you listening to me?" The transcriber should leave this as is.
      ii. The mom says, "I don't, I don't know what you mean." The transcriber should change to "Uh, I don't know what you mean."
      iii. The mom says, "I think I um I think, you know, that I should" I would change this to "Uh, um, I think you know that I should"
   b. Like:
      i. The mom says, "Oh, it was like, you know, 70 degrees outside" should be changed to "Uh, it was rrlike you know, seventy degrees outside"
      ii. The mom says, "It's not like I wanted to." This stays as is.
      iii. The mom says, "Do you like that? It's like your other stuffed animal. You know what I mean baby, like fluffy? She's rrlike smiling and laughing at this toy." Should be "Do you like that? It's like your other stuffed animal. You know what I mean baby, like fluffy? She's rrlike smiling and laughing at this toy."
   c. Well:
      i. Mom says: "Well, it's not like you started it." Should be "rrWell, it's not like you started it."
      ii. Mom says: "You know very well what I mean" stays as is.
      iii. Mom says, "Oh, well, I don't know, do whatever you want." Should be "Uh, rrwell, idon't know, do whatever you want."

**Formatting:**

The transcript should be formatted in a way that a reader can follow the flow of the language. If the mother says “What baby?” and the child then replies, “Look at the xxx,” and then at the same time they both say “Uh,” the transcript would look like this:

<table>
<thead>
<tr>
<th>Participant id</th>
<th>111111</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>3/31/2013</td>
</tr>
<tr>
<td>File Time</td>
<td>9:05-9:07</td>
</tr>
<tr>
<td>Mother’s Transcript</td>
<td>Child’s Transcript</td>
</tr>
<tr>
<td>What baby?</td>
<td>Look at the xxx.</td>
</tr>
<tr>
<td>Uh.</td>
<td>Uh.</td>
</tr>
</tbody>
</table>
Transcript color code legend:

Words need to be in red if the mother is talking to someone other than the target child (including talking to herself), and if the target child is talking to someone other than the mother (including to him/herself).

Highlight the heading (so the id, file time, etc.) in pink if you believe the audio file contains Spanish and you can’t translate.

If you can translate, then translate into English, and highlight the words you translate in yellow. Also make notes in an appendix in the end for what was changed, etc.

If the words you are translating into English are spoken to someone else, then make sure the text is red, and it’s highlighted yellow.
REFERENCES


behavioral and biological sciences (pp. 241–280). New York: Cambridge University Press.


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