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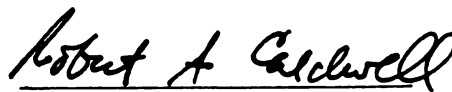
The Relationship Between Maternal Physical Abuse
Potential and Infant Development in the First Year
of Life

presented by

Laura Nathans

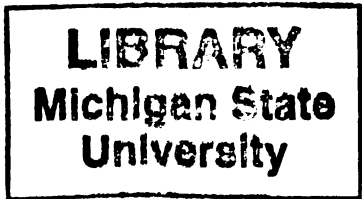
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THE RELATIONSHIP OF MATERNAL PHYSICAL ABUSE POTENTIAL TO
INFANT DEVELOPMENT IN THE FIRST YEAR OF LIFE

By

Laura Nathans

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ABSTRACT

THE RELATIONSHIP OF MATERNAL PHYSICAL ABUSE POTENTIAL TO INFANT DEVELOPMENT IN THE FIRST YEAR OF LIFE

By

Laura Nathans

This study examined a sample of 151 mothers and their infants during the infants' first year of life in order to determine the effects of maternal physical abuse potential in the absence of substantiated abuse incidents on infant development. Belsky (1993)'s ecological model for child maltreatment was employed as the theoretical formulation of child abuse potential-related factors. This model postulates causal influences in maltreatment situations that stem from individual parent and child traits, familial interactions, and community supports. Data was collected as part of a home visiting parenting intervention soon after the infant's birth (Time 1) and one year later (Time 2). Factor scores from Milner (1986)'s Child Abuse Potential Inventory (CAPI) as well as a home visitor report of parenting skills (KCHS Clinical Judgments Form) were used as measures of the constructs tapped by Belsky's model, and the Denver II (1990) assessed infant development. Results illustrated significant effects of parent-level individual factors at all time frames. Also, significant relationships were determined for child-level individual factors at Time 2, and for change scores between Times 1 and 2. Finally, significant correlations were found for community-level factors at Time 1. Thus, it was concluded that individual parent and child traits produce the most salient impacts on infant development in families with a high potential for maternal physical abuse.

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Chapter 1: Introduction

Overview.

A great deal of research in the past three decades has evidenced numerous detrimental effects of child abuse on children (e.g., Wekerle & Wolfe, 1996). Similar harms have been demonstrated in abused infants (e.g., Zeanah, Borris, & Larrieu, 1997), although this time frame is less well-investigated. A specific avenue necessitating further research is that of the mechanisms through which abuse produces its effects, as it is unclear whether such harms are engendered by the abuse itself or the environments in which abusive interactions occur. Further examination of child abuse risk factors' effects on developmental pathways of infants would help to elucidate how such trajectories can be beneficially altered through such interventions as child abuse prevention programs, as well as more accurately identify factors responsible for such programs' efficacy. This study will entail conducting such an investigation with families of infants in their first year of life at high risk for becoming child abusers—yet who have not been documented as abusing. It is expected that parental, child, familial, and contextual/community risk factors will produce harmful effects associated with abuse, even in its absence.

In the past decade, researchers have begun to explore the detrimental effects of parental abusive behaviors during infancy. Such investigations are comparatively new in the field of child abuse research, which has primarily focused on the massive harms child abuse victims accrue across the developmental trajectory—particularly in the years following infancy and toddlerhood (e.g., Aber & Allen, 1987; Friedrich, Einbender, & Luecke, 1983).

Concerning infancy, sparse yet revealing literature has illustrated that infant abuse is related to maladaptive infant functioning in the motor, cognitive, and particularly the social area, where the most dramatic examples of the harmful effects of infant abuse can be found (Zeanah et al., 1997). For example, maltreated infants have difficulty forming secure bonds with their parents, evincing disorganized attachments to their mothers, as well as distress in interactions with them (Zeanah et al., 1997). They also show internalizing difficulties, such as affective withdrawal, anhedonia, and less positive self-perceptions, as well as externalizing behaviors, including a greater propensity towards anger in response to life situations and increased peer-related aggression (Zeanah et al., 1997). However, the paucity of studies concerning infant abuse and surrounding environmental conditions—e.g., poor parenting skills, depleted community support networks, and variegated cultural contexts of infant abuse—necessitates further exploration of these issues. When a more holistic understanding of situational concomitants of such abuse-engendering situations is obtained, more effective efforts can likely be undertaken to prevent child abuse as well as developmental harms related to these dysfunctional environments.

Potential extended effects of physical child abuse are varied, including psychological, social, and cognitive manifestations. Concerning psychological effects, many child abuse victims show such emotional difficulties as post-traumatic stress disorder, suicidal and destructive behaviors, a low self-esteem, and a more generally negative outlook towards life events in general (Wekerle & Wolfe, 1996). Socioemotional deficits are also likely to be present throughout childhood. For instance, physically abused children frequently show insecure attachments to mothers; more

avoidance and approach-avoidance behavior with other caretakers; responses to distress in peers characterized by fear, physical attack, and anger; and hampered capacities to be sensitive to social cues and discriminate emotions in others (Aber & Allen, 1987; Wekerle & Wolfe, 1996). In the area of cognitive impairments, physically abused children have demonstrated significantly lower scores on measure of overall intelligence (Wekerle & Wolfe, 1996) as well as on more specific verbal skills, such as memory for words and sentences and ability to recite words (Friedrich et al., 1983). The above findings paint a bleak picture of future functioning for children reared in abusive environments.

While it may seem obvious in light of the above evidence that child abuse is detrimental to healthy child development, the mechanism for such effects is not clear, as stated above. To further clarify, there are two possible pathways leading to the negative effects of abusive home environments on children. First, the physical abuse itself may be responsible for the outcomes outlined above. Second, deficiencies in the ecological context in which such infants are reared, including poor parenting skills, lack of social support for parents, a cultural context facilitative of abuse-related behaviors, and perceived traits of the infants themselves, may be responsible for these results—even if such conditions do not escalate to the level of actual abuse.

A more comprehensive exploration of the dynamics surrounding abusive situations—as opposed to merely the abusive incidents viewed in isolation—allows for elucidation of the means by which abuse influences child development. The characteristics of abusive individuals and the environments they interact with as well as engender have been proven to correlate with maladaptive infant social, cognitive, and

motor development (e.g., Calkins & Fox, 1992; Field, 1995; Zeanah et al., 1997), findings suggestive of significant negative impacts independent of the abuse itself. A more fine-grained analysis of which specific infant developmental difficulties are associated with abuse-evocative familial situations is needed to enhance preventive and treatment approaches. However, a theoretical framework within which to conceptualize aspects of putatively maltreating contexts is needed through which to conduct such analyses. Belsky's ecological model of child maltreatment provides such a formulation.

Throughout his career, Jay Belsky has developed a model of factors involved in the etiology of child abuse that incorporates several theoretical models. The conceptual basis for this theory was first outlined in Belsky (1977) and was based on Bronfenbrenner (1977)'s ecological framework for conceptualizing multiple, interacting levels of influence on human development. In his initial formulation, Belsky cited three etiological models for abuse: a) the psychiatric model, which referred to "deep seated emotional disturbances" (p. 117) present in the abuser that cause him/her to behave in abusive ways; b) the sociological model, which emphasized both cultural attitudes towards violence and societal stressors as abuse-engendering; and c) the effect of child on caregiver model, which figured the effects of child traits perceived to be noxious or unattractive as being elicitors of parental abusive behaviors. Belsky (1977) argued that as abuse has been documented in families exposed to stressors inherent in all three of the theoretical models, a "dynamic interplay between adult, societal, and child characteristics is at work in the abusive process" (p. 120). For example, Belsky's model asserts to examine interactions—such as the positive effects of social support and growth-enhancing work environments on self-esteem—as opposed to only main effects at each

level (Belsky & Vondra, 1989). It is only when familial risks exceed assets that abuse is likely (Belsky, 1993; Belsky & Vondra, 1989). Such theorized interactions between parent, child, and contextual factors have been explored in much greater depth in Belsky's later work. The final formulation of this theory—as outlined in Belsky (1993)—breaks contextual factors down, positing effects at familial, community, cultural, and evolutionary levels. A discussion of relevant components will help clarify the theoretical underpinnings of this study.

To begin with, Belsky's ecological model of child maltreatment addresses the parent's role in abusive familial situations as part of the individual—meaning characteristics manifesting themselves intraindividually—level of his formulation. Several parental traits empirically validated to be correlated with abusive behaviors have been factored into the parental component of this model (e.g., Belsky, 1993). First, parental abuse histories have been cited as being significant predictors of child maltreatment, as the “intergenerational transmission of abuse” hypothesis has received some research support (Belsky, 1984, 1993). Parents' psychological maturity, complexity, and well-being (e. g., poor self-esteem in such traits as a poor image, greater levels of aggression/anger, external locus of control, inactive coping style, and impulsivity) are factored into this stage of the ecological model (Belsky, 1984, 1993; Belsky & Vondra, 1989; Holden et al., 1992). Another individual trait-level factor incorporated in Belsky's ecological model of child maltreatment is that of characteristics of the maltreated children themselves. Belsky (1993) highlighted that—particularly for physical abuse and neglect—children between the ages of three and eight are most likely to be maltreated, purportedly due to their mixed dependency and strivings for autonomy

as well as their lack of ability to regulate their emotions. In addition, literature has also illustrated relationships between abuse and infants and children with “non-optimal” physical characteristics, such as premature infants, handicapped children, colicky infants, asthmatic infants, sleep-disordered infants, and infants needing intensive neonatal care (Belsky, 1993; Culbertson & Schellenbach, 1992; Kaufman, Johnson, Cohn, & McCleery, 1992). Moreover, temperamental traits, such as increased irritability, fussiness, dependency, and overactivity have been associated with a greater likelihood for physical child abuse (Belsky, 1984; Culbertson & Schellenbach, 1992). However, this body of literature yields inconsistencies, which Belsky (1993) marshaled as supporting the need to incorporate other levels of the ecological model to determine when such equivocally-demonstrated risk factors evoke abuse.

A first contextual level that Belsky has hypothesized to play a role in the maltreating environment is that of the nature of familial interaction as a whole, which Belsky has termed the “microsystem” (Belsky & Vondra, 1989). Such abuse-engendering behaviors are demonstrated in several ways, one of which is parent-child interaction. In general, a lack of adequate parent-infant bonding in the first year has been found to increase risk for physical abuse (Kaufman et al., 1992). Also, many studies have demonstrated that physically abusive parent-child dyads are more reciprocally negative in their interactions (Belsky, 1993). Abusive parents are less supportive of their children, direct fewer positive behaviors towards them, are less responsive to children’s initiation of social interactions, have less fun with them in the postpartum period, show less affection, are more hostile, controlling, and punitive than nonabusive parents (Belsky, 1993; Kaufman et al., 1992). In addition to parent-child interactions, marital

tensions as well as overall familial negativity levels have been shown to be predictive of abuse (Kaufman et al., 1992). In sum, Belsky has claimed that such unhealthy interactions can facilitate child maltreatment if combined with characteristics from other levels in his model.

In addition to individual and familial variables, the “broader context” in which abuse occurs is a key level in Belsky (1993)’s formulation. The “broader context” level of the ecological model consists of a) the community context in which the abusive family exists (termed the “exosystem”), b) the cultural context in which abusive behaviors occur (termed the “macrosystem”), and c) the evolutionary context in which the human species has developed (Belsky, 1993; Belsky & Vondra, 1989). Only the community context will be discussed, as cultural and evolutionary contextual variables are unilaterally applicable to all subjects in this study and are thus not variable. Concerning the community context in which abuse takes places, a great deal of literature has shown that social isolation and a lack of social support in general are contributory factors to child maltreatment (Belsky, 1993). Such families’ lack of social support has been evidenced in several ways—through their smaller networks of friends, less frequent contact with relatives, less use of community resources, less involvement in community activities, and smaller likelihood to own a telephone (Belsky, 1993). Belsky and Vondrda (1989) have shown that less total support is associated with more punitive child-rearing styles that could lead to abuse. Moreover, it has been shown that social support through friends in the community functions to provide guidelines and feedback concerning appropriate parenting behaviors. Support also leads to better understanding of neighborhood social risks and provides nurturance that facilitates emotionally responsive child-rearing and a maternal sense of

competence in parenting (Belsky, 1984; Culbertson & Schellenbach, 1992). In sum, it appears that encapsulating the individual and familial levels of child maltreatment is an overarching layer of networks families are enmeshed in that interacts with factors above and below it to engender abuse.

In sum, Belsky's conceptual model relies upon an examination of a multiplicity of factors impacting the dynamics of abusive households, postulating influences resonating at individual, dyadic, familial, community, societal, and evolutionary levels. It is theorized that it is only when there are more inherent stressors than strengths contained within the composite of all levels that abuse is likely to be present.

An investigation examining the above-outlined child abuse risk factors' effects on infant development is highly relevant to the field of child abuse prevention, which is geared towards amelioration of putatively problematic life situations inherent in potentially abusing families. Willis, Holden, and Rosenberg (1992) have highlighted that it is only through understanding of etiological and risk factors responsible for development of problems such as child abuse that prevention efforts can be effective. By clarification of the factors responsible for maladaptive infant development, the routes through which child abuse prevention programs achieve effects can be better comprehended and related risk factors more clearly identified. The utilization of a sample at this age also allows for exploration of the earliest contributory factors to abusive situations, thereby potentiating researchers' and social service agencies' abilities to derail possibly abusive families' unhealthy developmental paths very early on. Prominent researchers have stressed the need for research with this age range, as infants

and young children are disproportionately found to suffer the most severe and fatal abuse (Culbertson & Schellenbach, 1992).

Child abuse prevention is increasingly being seen as a viable means of addressing the above-cited difficulties, particularly efforts aimed at families at high risk for abuse (Wekerle & Wolfe, 1996). Prevention efforts have been viewed as particularly useful means of tackling such problems as the greater need for and societal cost of mental health services that maltreated children require (Willis et al., 1992). Such programs aim to alter the developmental trajectory from “pathological outcome to normative development” (Willis et al., 1992). These efforts rely upon a growing base of knowledge of risk indicators for abuse found at individual, familial, and societal levels (Wekerle & Wolfe, 1996) such as those captured by Belsky’s model. Thus, this study will attempt to better clarify individual, familial, and community-level risk factors’ roles in such situations, anticipating significant roles for factors at all levels in infant social, language, and motor development during the first year of life.

Role of Maternal Psychopathology.

Belsky’s ecological model of child maltreatment has implications for the study of infant maltreatment, as each of its levels contains elements associated in research literature with specifically infant parenting skills. First, the parenting component of the individual level of the model can be linked to literature on maternal psychopathology and infants, as maternal emotional stability/ mental health is conceptualized as being particularly impactful at that level. Evidence that details the relationship between

maternal psychopathology and infant development can first be obtained from research addressing overall levels of maternal psychopathology.

Scott, Musick, Clark, and Cohler (1983) conducted the seminal study of the relationship between maternal psychopathology and infant cognitive and social functioning. In order to obtain a bigger picture of the effects of maternal mental illness, these researchers grouped several types of mental illnesses together. They examined women with various psychopathological diagnoses—the mental illness group—as well as controls in feeding and play situations, in addition to testing their levels of cognitive and motor development. Results supported that infants of mentally ill mothers displayed significant cognitive and social, but not motor, deficits. For example, these infants showed less reciprocal and connected behavior, such as decreased attention-seeking and responsiveness to mothers, as well as were described as sending less clear and interpretable social signals than infants with mothers who were considered well. Infants of mentally ill mothers also evinced affective disturbances, such as more emotional lability in short periods of time, as well as greater overall negative affect, than infants with psychologically healthy mothers. Thus, in general, maternal psychopathology appears to engender immediate, maladaptive consequences for infant cognitive and social development.

Sameroff, Seifer, and Barocas (1983) found that these deficits are maintained across the developmental trajectory of infancy. They compared mentally ill mothers with a variety of psychiatric diagnoses and their infants to nonpathological mother-infant dyads on measures of motor, cognitive, and social development when infants were newborn, four months, 12 months, 30 months, and 48 months old. Results supported

consistent patterns of deficits in all three major areas of infant development. At four months, infants of mentally ill mothers displayed more social deficits, such as difficult temperaments and less adaptive social behavior, as well as cognitive and motor impairment. At one year, these infants showed less spontaneous social responsiveness, as well as less overall mobility (a motor deficit). Lastly, at 30 and 48 months, infants with mentally ill mothers earned lower scores on measures of cognitive development and were reported to exhibit maladaptive social behaviors. Thus, this study supports stability of deficits across the developmental trajectory—with only motor deficits disappearing between 12 and 30 months.

In addition to the effects of maternal mental illness in general, specific maternal disorders have been shown to be detrimental to infant social, cognitive, and motor development. First, a great deal of research has been conducted regarding the effects of depressed mothers' interactions on their infants (Cohn & Tronick, 1988; Pickens & Field, 1993). This literature has supported that such mothers show less sensitivity to their infants and provide them with less stimulation, spending less time looking at, touching, and talking to their infants (Field, 1995; Zeanah et al., 1997). Depressed mothers also have been found to exhibit more negative facial expressions and less positive affect while interacting with their infants, as well as view their infants' behaviors more negatively than do more psychologically healthy mothers (Field, 1995; Field, Morrow, & Adlestein, 1993; Zeanah et al., 1997). In addition to socioemotional parenting deficits, research has demonstrated that these mothers' speech to their infants, which infants model in their own language development, is different from that of nondepressed mothers. For example, depressed mothers make shorter utterances, take longer to respond to infant

cues, fail to adjust their speech to their infants' speech, and use fewer rising and falling intonations in interactions with their infants (Bettes, 1988). Overall, depressed mothers' difficulties are reflected in their perceptions of and social exchanges with their infants.

In turn, infants of depressed mothers manifest social deficits, mirroring their mothers' behaviors and affect (Cohn & Tronick, 1988; Pickens & Field, 1993). Such infants demonstrate lower activity levels and produce fewer vocalizations in interactions with their mothers than infants of well mothers, as well as look away from their mothers more, in response to the lack of maternal stimulation and engagement provided them (Field, 1995; Sameroff et al., 1983). In addition, infants of depressed mothers match their mothers' negative affect, spending more time in negative than playful states as well as less time in positive states overall than infants of nondepressed mothers (Field, 1995; Field, Healy, & LeBlanc, 1989; Field et al., 1993). Moreover, maternal affect has been illustrated to frame infant affective states. Cohn and Tronick (1998) and Pickens and Field (1993) have reported that positive affect causes infants to cycle between affectively positive and neutral states, as reflected in both facial and behavioral expressions, while mothers' depressed affect engenders infant expressions that are patterned alternatively between neutral and averted gazes. Maladaptive infant social behaviors associated with difficult infant temperaments have been strongly correlated with maternal negative affect, as well (Levitt, Weber, & Clark, 1986). Thus, in general, depressed mothers' emotional state is harmful to that of their infants in various ways.

These problematic communication patterns result in the formation of disorganized and insecure attachments between the infant and the depressed mother (Levitt et al., 1986; Zeanah et al., 1997). Infants who became anxiously attached at some point during

their first 18 months have been found to have mothers who showed such depressive traits as lacking confidence, irritability, increased negative affect, and decreased interest in engaging their infants in reciprocal social interactions (Egeland & Farber, 1984; Levitt et al., 1986). Thus, in general, such infants' ability to use their mothers as a secure base from which to explore and master their environment is disrupted by maternal depression.

In addition to the problems infants of depressed mothers have in interactions with their mothers, such infants utilize the social behaviors learned from these exchanges when interacting with nondepressed adults (Field, 1995). For example, Field et al. (1989) found that three- to six-month-old infants of depressed mothers did not vary their behavior significantly when interacting with mothers vs. strangers. These infants exhibited similar deficits in both interactions, including problems with vocalization, fussiness, and decreased physical activity. Moreover, when interacting with depressed infants, strangers received lower ratings on measures of state, physical activity, vocalizations, contingent responding, and game playing. Thus, such infants' social deficiencies propagate a repetitive cycle of negative interactions across varying social environments. However, these conclusions must be qualified by the finding that infants do exhibit less impaired social behavior with familiar nondepressed adults at three months in such areas as head orientation, gaze behavior, positive facial expressions, and fussiness (Pelaez-Nogueras, Field, Cigales, Gonzales, & Clasky, 1994).

In addition to its immediate effects on infants' social interactions, maternal depression is predictive of infant developmental delays in motor, cognitive, and social functioning that do not appear until months after mothers begin to exhibit depressive symptomatology. For example, research has illustrated predictive relationships between

maternal depressive symptoms and maternal reports of both externalizing and internalizing behavior problems in boys at age 3, use of less adaptive behaviors at home at this age, and infant anxious attachment (Del Carmen, Pedersen, Huffman, & Bryan, 1993; Radke-Yarrow, Cummings, Kuczynski, & Chapman, 1985; Sameroff et al., 1983; Shaw et al., 1994). Importantly, greater duration of maternal depression has been determined to enhance the manifestation of cognitive, motor, and social difficulties (Field, 1995). Predictive relationships have also been shown between levels of overall depressive and anxious symptomatology and infant anxious attachment (Del Carmen, Pedersen, Huffman, & Bryan, 1993; Radke-Yarrow, Cummings, Kuczynski, & Chapman, 1985). In sum, maternal depression can result in developmental delays in all areas of the infant's functioning, as supported by both objective and subjective perspectives. These effects appear to be moderated by duration of depressive symptomatology.

Research has also illustrated that others forms of maternal affective illness—such as heightened levels of maternal anxiety and aggression—are associated with hampered infant development. For instance, Feldman, Greenbaum, Mayes, and Erlich (1997) found change in maternal trait anxiety levels between three-month and nine-month evaluations was the most significant predictor of quality of mother-infant interactions. In addition, Egeland and Farber (1984) determined that changes from secure to insecure attachments (both avoidant and resistant) between 12 and 18 months were predicted by maternal social desirability (nonaggression) scores as well as by maternal aggression and suspiciousness scores. Thus, anxious and aggressive maternal traits predictively influence infant development.

Implications for this study.

In light of all of the above evidence in support of relationships between maternal psychopathology and infant development, a link between the parenting component of the individual level of Belsky's model and infant development can surely be postulated. This hypothesis will be tested in this study.

Role of Infant Temperament.

A great deal of research has also been conducted that assesses issues relevant to the relationship between infant development and the child component of Belsky's individual level. As child traits that render them hard-to-manage are theorized to be part of the abusive situation, infant traits' effects on their own development are relevant to examine when linking this model to this particular age group. This literature has supported that infant traits that facilitate parenting stress, such as a difficult temperament, are related to developmental delays and deficits in infant social and cognitive functioning. For example, ratings of infant activity level have been shown to be correlated with how responsive three- to six-month-old infants were in feeding interactions, as well as to how long interactions were sustained (Hahn, 1989). Thus, the social stimulation infants received was clearly shaped by their own temperaments.

The link between infant difficultness and problems in infant social functioning is further elucidated in literature that addresses the relationship between infant temperament and infants' abilities to form secure attachments to their mothers. Infant temperamental traits have been shown to affect responses in such attachment-measuring research paradigms as the Strange Situation (Calkins & Fox, 1992; Wachs & Desai, 1993). These

results are likely found because such characteristics as infant irritability may lead the infant to experience greater distress at separation and thus desire quick reunion (Calkins & Fox, 1992). In samples of one-year-olds, maternal temperamental ratings have been determined to predict attachment classifications in the Strange Situation (Rieser-Danner, Roggman, & Langlois, 1987), as well as specific infant behaviors during the test such as orientation to people and toys (Braungart & Stifter, 1991). These results have been replicated with another measure of infant attachment—Waters' revised Attachment Q-Sort—thus illustrating that this relationship holds up across different measurement instruments (Wachs & Desai, 1993). Thus, in general, infant temperament affects the overall quality of the attachment relationship as well as behaviors fundamental to this relationship.

In addition to concurrent effects of infant temperament on attachment, research has also supported predictive associations between these variables. For example, significantly more infants who have been rated as having a difficult temperament at three months were also labeled as insecurely attached at one year in a mixed-social-class Caucasian sample (Frodi, Bridges, & Shonk, 1989). Moreover, specific infant temperamental traits have been directly linked to their later attachment classifications. For instance, Del Carmen et al. (1993) discovered that infant negativity levels at three months predicted attachment classification at one year in a Caucasian middle-class sample. Lower autonomic stability and less person orientation at birth, as well as sensitivity in feeding and play situations and expressiveness at six months, have also been shown to be significantly correlated with anxious resistant attachment at one year (Belsky & Rovine, 1987; Egeland & Farber, 1984). In addition, levels of fussiness/irritability at

three, six, and nine months as well as a lower activity level at both birth and five months have been correlated with more insecure attachments overall at one year (Belsky, Rovine, & Taylor, 1984; Calkins & Fox, 1992; Egeland & Farber, 1984). Changes in temperament are also predictive of later attachment, as Belsky et al. (1991) evinced that infants who decreased in emotionality between three and nine months were more likely to be classified as insecurely attached at one year. Thus, in general, infant temperament appears to be strongly related to infant social development and relational attachments in a predictable fashion.

In order to further support the role that problematic infant traits play in impacting infant development, the literature that examines the relationship between infant temperament and maternal behaviors must be explored. Several researchers have posited that a link between difficult infant temperament and problems in social, cognitive, and motor functioning is the behavior that infants with difficult temperaments elicit from their mothers (Calkins & Fox, 1992). Mothers have been shown to provide less social stimulation to infants with difficult temperaments, both through direct interactions and provision of appropriate play materials (Hahn, 1989; Klein, 1984). For instance, Klein (1984) determined that greater perceived levels of difficult temperament effected changes in mothers' provision of appropriate stimulation, such as giving infants fewer age-appropriate toys to play with, being less involved overall with infants, providing them with less positive social stimulation, and being less responsive to infant cues. Importantly, the temperamental dimensions assessed in this study resulted in consistently negative patterns of interaction over time, as results were virtually identical for 6- and 12-month-old infants. In light of the wealth of evidence cited above, it can be asserted that

infants appear to play a significant role in concurrently shaping the interactions they take part in, as well as the level of care they receive.

The interaction between temperament and maternal sensitivity as well as other parent-related variables has predictive effects on infant development directly, in addition to the aforementioned indirect effects through its role in molding growth of parenting skills. For example, Susman-Stillman et al. (1996) discovered interactive, predictive relationships for specific levels of infant temperament and maternal sensitivity. The interaction between low irritability and high maternal sensitivity at three months predicted attachment status at 12 months, and maternal sensitivity at six months mediated the effects of irritability at six months on attachment status at 12 months. Thus, the researchers concluded that maternal sensitivity develops in response to infant behaviors such that it becomes the pivotal mechanism through which irritability influences the attachment relationship. In addition, the interaction between maternal physical contact—a component of maternal sensitivity subsuming such variables as emotional touch and physical responsiveness to infant cues—and infant activity level has been determined to predict infant attachment status at 12 months (Bohlin, Hagekull, Germer, Andersson, & Lindberg, 1989). Overall, the social development literature supports concurrent and predictive relationships between infant temperament and infant social development.

Infant behavior that influences attachment status has also been shown to selectively impact infant cognitive development. For example, Klann-Delius and Hofmeister (1997) carried out research evincing that infants rated as securely attached at 12 months produced more vocalizations, as well as responded more quickly to their mothers' utterances, in play interactions at between 18 and 36 months. In contrast, when

separated from their mothers during the play situation, insecurely attached infants' language patterns differed from those of securely attached infants, containing more utterances that showed signs of disruption upon separation from their mothers than did securely attached infants. Thus, attachment status affects infants' ability to possess adequate language skills and appropriately express distress.

Implications for this study.

In general, this body of literature pointedly illustrates how infants significantly contribute to their own cognitive and social development in the first year of life in ways related to the maladaptive parenting domains factored into the child component of the individual level of Belsky's ecological model. This study will test this hypothesis by determining the relationship between an index of overall infant development and the child component of the individual level of Belsky's ecological model.

Role of Marital Support.

Several studies have been conducted that provide evidence that unhealthy familial interactions in general that contribute to maladaptive parenting are related to detrimental infant-rearing behaviors. Such literature is relevant to the familial level of Belsky's ecological model, which incorporates marital/parenting couples' dyadic interactions as part of the overarching abusive situational dynamics. The first major relationship this literature supports is between the quality of marital interactions in intact families and infant social development. Positive correlations have been found between marital conflict and infant and toddler intrusive behavior, as well as conduct problems (Zeanah et al., 1997). For example, Shaw et al. (1994) explained that for a low socioeconomic status sample, infant difficulties in social development might manifest themselves only after

marital dissatisfaction is present. They discovered that for girls only, low mother ratings of marital satisfaction at one year predicted maternal ratings of behavior problems on the Child Behavior Checklist for ages two and three. In addition, Belsky et al. (1991) reported a relationship between marital conflict and infants' abilities to show positive affect in social interactions. Thus, concurrent and predictive relationships exist between marital conflict and maladaptive infant social behaviors.

Parenting couples' dissatisfaction and conflict have also been shown to influence infants' abilities to form secure attachments with their mothers. A linear relationship has been determined between increasing infant exposure to parental conflict and infant behaviors characteristic of insecure attachment (Zeanah et al., 1997). For example, Goldberg and Easterbrooks (1984) discovered that the less adjusted the married couples they tested were in terms of agreement, affection, and overall satisfaction with the marriage, the more likely their 20-month-old infants were to be insecurely attached. Moreover, the most disorganized attachment behavior has been reported in families where domestic violence is present (Zeanah et al., 1997). Thus, the greater the level of marital/parental couples' conflict in a family, the greater the infant attachment difficulties.

In addition to parenting couples' conflict and overall level unhappiness, levels of support mothers obtain from their partners has been found to relate to infant social development and attachment status. Zeanah et al. (1994) explained that parents who support one another and portray a sense of closeness raise infants who show more positive behaviors in social situations. An example of this effect comes from a study conducted by Crnic et al. (1984). They examined the relationship between infant social

development as exhibited in a dyadic home interaction at 4, 8, and 12 months and maternal spousal support as measured at one month in a middle-class sample. Findings highlighted that greater spousal support at one month contributed significantly to prediction of greater infant responsiveness to mothers, as well as to more positive affect shown towards them at four months.

This body of literature has also delineated how spousal support impacts infant social behaviors in the form of attachment status. For example, Jacobson and Frye (1991) determined that in a lower-class sample, maternal satisfaction with spousal support immediately prior to the infant's birth predicted infant attachment ratings at 13 months. Lastly, spousal support has also been shown to predict mothers' behavior towards their infants, which in turn affects infant social development by eliciting and influencing infant behaviors. For instance, Crnic et al.'s study determined that maternal spousal support at one month significantly predicted how much positive affect mothers showed in interactions with their four-month-old infants. In general, this body of research suggests that infant social development is linked to spousal/partner support directly, as well as through its effects on the mother.

Implications for this study.

Overall, the predictive relationship between the parenting dyad, and familial component of Belsky's ecological model, is well-supported, particularly in the area of social development. This hypothesis is tested in this study. It adds a dimension to the findings above, which notably only examined predictive effects of parenting couples' interactions on infant development. In contrast, this study also looks at concurrent

relationships and immediate effects of family problems on infant development, expecting to discover that such correlations, in fact, exist.

Role of External Support Systems.

The last domain relevant to maladaptive parenting that Belsky's ecological model incorporates is that which addresses parents' levels of external social support.

Researchers have found that lack of an external support system can impede infant development, particularly in the area of social development. Such literature is applicable to the community level of Belsky's model, which postulates a role for social support in potentiating abusive familial dynamics. Crockenberg (1981) conducted the seminal study of the predictive relationship between social support and infant social development in the area of attachment. Crockenberg found that low social support from such individuals as extended family, friends, and neighbors significantly predicted infant classifications of anxious-avoidant and anxious-resistant attachment even after the effects of maternal responsiveness to infants in a play interaction at three months were partialled out. In addition, low social support mediated the relationship between maternal responsiveness and security of attachment. In general, these results suggest that the effects of low social support longitudinally shape the effects of parenting behaviors on infant social development.

Social support has also been shown affect infant attachment status in interaction with infant temperament variables. For example, Levitt et al. (1986) found that in a middle-class sample of mothers and their 13-month-old infants, temperamentally difficult infants with mothers who reported receiving unsatisfactory social support from their own

mothers were likely to be classified as anxious-avoidant. Thus, particular types of social support can interact with innate infant traits to engender specific typologies of attachment style.

The finding that infant temperament interacts with social support has also been illustrated in research that addresses maternal responsiveness to infant behaviors. As mentioned earlier, these effects can be hypothesized to indirectly affect the infant's social development, as greater social stimulation facilitates this development. For example, Crockenberg and McCluskey (1986), in reanalyzing data from the Crockenberg (1981) study cited above, found interactions between an irritable temperament at birth and maternal social support to predict maternal sensitivity at one year. Thus, the development of parenting skills relevant to handling innately difficult temperamental traits is impacted by social support.

Social support has also been shown to directly impact maternal behaviors outside of temperamental variables, in turn affecting infant development. For example, Hahn (1989) assessed relationships between social support as measured by the Community Interaction Checklist and mothers' responsiveness to their three- to six-month old infant's cues in a play observation. They determined that mothers were more responsive to their infants when mothers experienced greater levels of social support. In addition, social support contributed unique variance to the rating of the overall quality of mother-infant interaction. Thus, social support directly impacts the quality of stimulation the infant receives.

Implications for this study.

Overall, the above evidence strongly supports the relationship between infant development—especially in the social sphere—and the social support component of Belsky’s community level. This study will test this hypothesis.

Role of Ethnicity/Culture.

This study is based on an ethnically and culturally mixed sample of Caucasian, Hispanic, and African American mother-infant dyads. Thus, it is possible for this research to examine the potential role of ethnicity and culture in shaping the hypothesized relationships between Belsky’s ecological model and infant motor, cognitive, and social development. It is important that any discussion of minority group parenting styles be prefaced with an acknowledgement of the fact that such parents potentially espouse world views that differ from that of the majority culture. In effect, infants reared in these homes are being prepared to function in different familial and social contexts than Caucasian infants. Therefore, value-laden assessments of the merits of minority parenting practices should be eschewed. If commonalities are found between minority infant outcomes and those obtained when examining infants with “likely-to-abuse” parents, it is important that researchers not draw inaccurate as well as damaging associations from such findings or assume that minorities employ abusive parenting practices. Rather, these results should be viewed as reflective of parenting conditions inherent in the daily lives of both types of parents (stressors, parental psychopathology, etc.), conditions that could engender developmental harms irregardless of culturally-based factors. This study will thus

elucidate how racially- and culturally-generated parenting stereotypes may, in fact, be associated with mediating variables such as those mentioned above.

The similarity between outcomes for infants in the literature alluded to above and ethnicity's role in infant development literature is first seen in research conducted by Sameroff et al. (1983). In their study of general maternal psychopathology cited above, Sameroff et al. found effects for such variables in interaction with socioeconomic status. For example, low socioeconomic status African-American infants earned lower Bayley scores—both cognitive and motor—at four months, as well as displayed less social responsiveness at one year and more maladaptive social behaviors at 30 and 48 months, than Caucasian subjects. Thus, ethnicity was implicated as potentially impacting infant development in all major areas across the developmental trajectory.

Research has also been conducted that specifically details how ethnicity, in interaction with social class, directly affects infant social behaviors, as well as indirectly affects them through elicitation of unhealthy maternal behaviors. Seifer et al. (1992), for example, found that minority infants interacted with their environment less positively than did Caucasian infants. First, when infants were four months old, African-American mothers were less spontaneous in feeding and caretaking situations than were Caucasian mothers of all socioeconomic classes. These maternal behaviors had direct impacts on infant social development, as low-SES African-American four-month-old infants were less spontaneous than Caucasian infants in caretaking situations, yet were more spontaneous in situations where they were distant from their mothers. At 12 months of age, similar effects were exhibited, with African-American infants being less verbally responsive in caretaking situations, as well as showing less ability to actively engage their

environments in the presence of their mothers, in comparison with Caucasian infants. Thus, racial variables differentiated quality of mother-infant interactions. However, this study will examine if such delineations were secondary effects of the parenting deficiencies cited in the above literature review that are not ethnically-based.

Ethnic/cultural variables have also been illustrated to affect infant development, engendering similar outcomes to those found in the literature cited in other sections of this paper. For instance, Field and Widmayer (1981) rated a wide range of mother-infant dyadic interaction variables in a sample of Cuban, South American, Puerto Rican, and African-American three-to-four-month old infants and their mothers. Results showed differences between infants from different ethnicities that paralleled interaction style differences their mothers exhibited. For example, discrepancies in the amount of time mothers spent speaking to their infants were found between cultures, with Cuban mothers vocalizing the most, followed by South American, Puerto Rican, and lastly African-American mothers. Mothers' mean length of utterances was rank-ordered in the same order. Interestingly, infant gaze scores were in the reverse order—with infants who were spoken to the most averting gazes the most. Thus, infants' social behaviors were directly tied into cultural differences—with African-American infants once again earning lowest scores. Such a pattern was also exemplified in direct mirroring of rankings for overall physical activity of mothers and infants during interactions as well as quality of feeding interactions—with both Puerto Rican mothers and infants earning highest scores, followed by Cuban, then South American, then African-American infants. This study is illustrative of how cultural differences—in addition to the racial variables cited above—may affect the manner in which infants develop.

Implications for this study.

Overall, differences in parenting outcomes found in both Seifer et al. (1992)'s and Field and Widmayer (1981)'s studies may simply reflect overarching parenting problems characteristic of specific parenting conditions endemic to these cultures' situational challenges. This study will assess this hypothesis, as well, purporting that the above theorization will be upheld.

Role of Teenage Parenting.

As was the case for infants from minority-status cultural backgrounds, literature examining infants born to teenage parents has supported that such infants experience similar developmental difficulties to those of parents with a strong likelihood to become physical child abusers (Elster, McAnarney, & Lamb, 1983). These findings once again beg the question of whether the adolescent parents' ages are the primary contributing factor in engendering infant developmental harms—or if such effects are due to general parenting deficiencies that create an unhealthy child-rearing environment regardless of parents' ages (as is hypothesized for ethnic/cultural effects). As this study examines comparable samples of adolescent and adult mothers and their infants, it allows for this question to be explored.

As was described for infants of high-abuse-potential parents, recent research has shown that infants of adolescent mothers experience developmental delays and deficits in social development. Concerning social deficits, studies have illustrated that such infants are more likely to be insecurely attached to their mothers (Elster et al., 1983; Teberg, Howell, & Wingert, 1983) as well as initiate less social contact with them (McAnarney,

Lawrence, Ricciuti, Polley, & Szilagyi, 1986), at around one year of age. In addition, Teberg et al. (1983) reported that these infants are less likely to maintain exploratory behaviors, show decreased activity levels, and have a restricted range of available search behaviors in mother-infant play interactions between 12 and 19 months. Similarly, Mercer, Hackley, and Bostrom (1984) discovered that 12-month-old infants born to teen mothers show less advanced social development overall than do infants of the same age with mothers in their twenties.

Implications for this study.

In sum, a wide array of problems in establishing and maintaining positive social interactions have been observed for infants of teenage mothers—difficulties that parallel those described for parents likely to be physical child abusers that thus could result from similar causative processes. This study will test this hypothesis. However, whether cognitive and motor deficits noted during the first year of life result from age-related behaviors or more generally-employed inappropriate child-rearing strategies has not been examined prior to this study. This investigation will test the proposition that such effects result from maladaptive parenting techniques.

Kent County Healthy Start Program (KCHS).

Recruitment for this project was accomplished by approaching a random selection of new mothers at a major metropolitan hospital to see if they would be interested in program participation. Assenting mothers were screened and placed in either high- or low-risk categories following risk assessment procedures. High-risk mothers were randomly assigned to intervention or control groups. Family support workers collected

data for this project beginning immediately after the families' enrollment in the program starting in June of 1995. This wave of data collection constituted what will be termed "Time 1" throughout the rest of this paper. These data were collected to provide a benchmark of what the family was like prior to intervention. One year after initial testing, data were collected again to determine intervention effects. This wave of data collection will be referred to as "Time 2" throughout the rest of this paper. At both Time 1 and Time 2, self-report measures of parental functioning such as the Child Abuse Potential Inventory (CAPI) were collected to quantify parental functioning. In addition, as part of family social workers' evaluations of families' progress, the Kent County Healthy Start Clinical Judgments form was developed. This measure was used to provide corroboration of parenting abilities as assessed by the CAPI from an outside observer's perspective, as many of the above studies did not assess perspectival divergence between subjective and objective reporting of infant behaviors (e.g., Shaw et al., 1994). Solely subjective examinations rendered results vulnerable to such biases as the maternal psychopathologies cited above, prior parental history with the infant, and past child-rearing experiences in general. Thus, the comparative perspective provided by objective observer ratings remedies this bias.

For purposes of this study, analyses were collapsed across control and intervention groups because no intervention effects were found in preliminary data analyses. The following results are a secondary data analysis. In order to assess both parent and infant outcome variables, assessments were conducted at both the first and second visits and were used in this study.

Hypotheses.

Hypothesis 1: a.) The number of problems in infant development will be positively and significantly related to individual, familial, and community-level measures of parent and child dysfunctionality, both in the months immediately following the infant's birth and a year after this initial testing. b.) Increases in infant developmental problems between the months immediately following the infant's birth and a year after this initial testing will be significantly correlated with increases in these same measures of dysfunctionality.

Hypothesis 2: a. More problems in infant development will be significantly related to higher scores on the KCHS Clinical Judgments form—an observational measure of parent-related individual factors. b. Increases in infant developmental problems between time one and time two will be significantly correlated with increases in scores on the KCHS Clinical Judgments form.

Hypothesis 3: Any significant relationships between race/culture and parents' age (teenage vs. adult), and infant development scores at times one and two—as well as changes in these scores between the months immediately following the infant's birth and a year after this initial testing —will be an artifact of the relationship between measures of all components of Belsky's ecological model and infant development scores.

Chapter 2: Method

Subjects.

Data obtained from the Kent County Healthy Start Evaluation Project was utilized for this study. The study tested a sample of 151 infants and their mothers, yielding a total of 302 subjects altogether. The sample was limited to those families for whom data was collected at both data points. Demographic characteristics of the sample are presented in the following table:

Table 1: Demographic Characteristics of Studied Sample

	<u>Frequency</u>	<u>Percent</u>	<u>Sample Size (N)</u>
<u>Ethnicity:</u>			136
Caucasian	69	50.7	
African-American	29	21.3	
Hispanic/Latino	22	16.2	
Asian/ Pacific Isl.	2	1.5	
American Indian	4	2.9	
Other	10	7.4	
<u>Child's Gender:</u>			144
Male	81	56.3	
Female	63	43.8	
<u>Mother's Marital Status at Time 1:</u>			136
Married	52	38.2	
Single	81	59.6	
Divorced	2	1.5	
Separated	1	0.7	
<u>Mother's Job Status at Time 1:</u>			127
Employed	39	30.7	
Unemployed	88	69.3	
<u>Father's Job Status at Time 1:</u>			108
Employed	83	76.9	
Unemployed	25	23.1	
<u>Household Income (est.) at Time 1:</u>			118
< \$15,000	74	62.7	
\$15,000 - \$24,999	17	14.4	
\$25,000 - \$34,999	13	11.0	
\$35,000 - \$49,999	6	5.1	
> \$50,000	8	6.8	

Table 1, continued: Demographic Characteristics of Studied Sample

	<u>Frequency</u>	<u>Percent</u>	<u>Sample Size (N)</u>
<u>Mother's Marital Status at Time 2:</u>			139
Married	55	39.6	
Single	78	56.1	
Divorced	3	2.2	
Separated	3	2.2	
<u>Mother's Job Status at Time 2:</u>			139
Employed	65	46.8	
Unemployed	74	53.2	
<u>Father's Job Status at Time 2:</u>			121
Employed	96	79.3	
Unemployed	25	20.7	
<u>Household Income at Time 2 (est.):</u>			140
< \$15,000	64	45.7	
\$15,000 - \$24,999	33	23.6	
\$25,000 - \$34,999	14	10.0	
\$35,000 - \$49,999	5	3.6	
> \$50,000	13	9.3	
	<u>Mean</u>	<u>Standard Deviation</u>	<u>Sample Size (N)</u>
<u>Mother's Age at Time 1</u>	24.24	5.71	140
<u>Father's Age at Time 1</u>	28.20	6.92	113
<u>Years of Education at Time 1—Mother</u>	11.24	2.33	133
<u>Year of Education at Time 1—Father</u>	12.07	2.57	106
<u>Number of Children at Time 1</u>	2.09	1.20	135
<u>Infant's Age in Mos. at Time 1</u>	5.40	4.32	150

Table 1, continued: Demographic Characteristics of Studied Sample

	<u>Mean</u>	<u>Standard Deviation</u>	<u>Sample Size (N)</u>
<u>Years of Education at Time 2—Mother</u>	11.32	2.57	136
<u>Years of Education at Time 2—Father</u>	11.96	2.76	114
<u>Number of Children at Time 2</u>	2.22	1.21	141
<u>Infant's Age in Mos. at Time 2</u>	18.72	5.28	150

Measures.

Child Abuse Potential Inventory (CAPI)

The CAPI abuse scale and its six component factor subscale scores were used to measure maternal physical abuse potential as theorized by Belsky's ecological model for child maltreatment. The CAPI is a 160-item self-report inventory in an agree/disagree, dichotomous-choice format that breaks down into six component factors discussed above (Milner, 1986). The Distress and Unhappiness factor scores have relevancy for measuring the parental component of Belsky's individual level, as they tap into levels of maternal psychopathology. Items for the Distress scale include "I am sometimes very sad," "I find it hard to relax," and "I am often angry inside." Items for the Unhappiness scale include "I do not laugh very much," "I am an unlucky person," and "I have a good sex life"—reversed scored (Milner, 1986). The Problems with Child and Self subscale is a representative measure of the child component of Belsky's individual level, as it assesses difficult-to-parent child traits. Items include "I have a child who is slow," "I have a child who gets into trouble a lot," and "I have a child who is bad" (Milner, 1986). The Problems with Family scale is an adequate measure of the marital and familial relationship components of Belsky's familial level, as it contains items tapping into marital and familial conflict (items include "My family fights a lot," "My family has problems getting along," and "My family has many problems") (Milner, 1986). Lastly, the Problems with Others factor score is a useful measure of the social support component of Belsky's community level, as it taps into the extent of the mother's perceived support system. Items include "Other people have made my life unhappy," "These days a person doesn't really know on whom one can count," and "Other people

have made my life hard” (Milner, 1986). Thus, the CAPI can be viewed as capturing major components of the individual, familial, and community levels of Belsky’s ecological model for child maltreatment and can be used to estimate relationships between different levels and infant social, language, and motor development.

The CAPI has been demonstrated to possess adequate reliability and validity. Milner (1994) reported that split-half reliabilities range from 0.96 to 0.98, Kuder Richardson-20 reliabilities range from 0.92 to 0.95, and test-retest reliability scores have been obtained of 0.91 for one day, 0.90 for one week, 0.83 for one month, and 0.75 for three months. The CAPI has shown adequate construct validity across a wide array of sampled groups (e.g., depressives, parents of children with emotional difficulties, individuals with low social support) (Kolko et al., 1993; Milner, 1994). Accurate classification rates for this scale have been calculated to be in the 90th percentile across a wide range of diverse samples (Milner, 1994).

Denver Developmental Screening Test II

The Denver Developmental Screening Test II was employed to rate infant motor, language, and gross and fine motor development across the infant’s first year of life. This measure is a 1990 revised version of the Denver Developmental Screening Test. Scores are determined by observing infants’ abilities to carry out basic, age-appropriate tasks. Scorers then rate the number of Advances, defined as items an infant passed that were passed by less than 25% of the initial standardization sample at the same age; Delays, defined as items an infant failed that were passed by 90% of the standardization sample at the same age; and Cautions, defined as items an infant failed that were passed

by 75% of the standardization sample at that age. Reliability estimates for the Denver have been found to be adequate, with interrater reliability estimates between trained observers and trained examiners of 98.7%. Test-retest reliability after a 10-minute interval has been determined to be 0.91 and after a seven-to-10-day interval to be 0.89 (Mirenda, 1996). No construct or concurrent validity estimates have been calculated, as the authors assert that the measure does not tap into unitary constructs as well as that there are no extant diagnostic tests that measure similar constructs (Mirenda, 1996).

KCHS Clinical Judgments Form

The KCHS Clinical Judgments Form's administration entailed the home visitor rating several parenting dimensions on a five-point Likert scale, such as knowledge of child development and anger management (Items 1 to 12). The home visitor also assessed on a four-point Likert scale the likelihood for mothers to engage in abusive or neglectful behaviors such as failure to provide adequate food and shelter as well as corporal punishment (Items 14 to 18). Items 1 to 12 and 14 to 18 were summed to produce two separate scores. The alpha coefficient for the first 12 items was calculated to be 0.92 and for items 13 to 18 to be 0.77. Item 13 was removed from analyses of this measure, as it did not load on either factor in preliminary factor analyses. The subscales can be seen as relevant to the parenting component of the individual level of Belsky's ecological model for child maltreatment, which, as mentioned above, taps into unhealthy parenting practices. It is also important to note that this measure was only given to families who received home visitor intervention. As the study collapsed intervention and control groups during analyses, the number of subjects who are used in determining

results with this measure will be lower than the number used to calculate results involving the Child Abuse Potential Inventory, which was given to all subjects.

Plan of Analysis.

Hypothesis 1: a. Correlations were calculated to determine the nature of relationships between Denver infant developmental scores and CAPI factor scores. b. Correlations between changes in Denver infant developmental scores and changes in CAPI factor scores were calculated to ascertain relationships between them.

Hypothesis 2: a. Correlations were calculated to determine the nature of relationships between Denver infant developmental scores and KCHS Clinical Judgments form scores. b. Correlations between changes in Denver infant developmental scores and changes in KCHS Clinical Judgment scores were calculated to ascertain relationships between them.

Hypothesis 3: CAPI factor scores (Distress, Unhappiness, Problems with Child and Self, Problems with Family, Problems with Others en total) were partialled out of significant correlations between infant development measures and mothers' age status (teenage vs. adult) to determine if such relationships still remain significant, as were KCHS subscale scores composite totals in a separate analysis. For ethnic category, two ANCOVA's were calculated with the 5 CAPI subscales listed above as covariates in one analysis and the 2 KCHS subscales in another, the ethnic category as the independent variable, and Denver scores as the dependent variable. This procedure was used to determine if development-ethnicity relationships are still significant outside of measures of components of Belsky's ecological model if the initial ANOVA's without covariates are significant.

Chapter 3: Results

Overview.

The purpose of the present study was to determine the association of abuse-engendering environments with maladaptive infant social, cognitive, and motor development in homes lacking substantiated abuse incidents. It was hypothesized that all developmental harms that have been illustrated in prior research to be concomitants of physical abuse would also be significantly related to critical components of potentially—but not actually—abusive environments. To determine the relationships between parenting variables and infant development, in order to avoid alpha inflation, significant correlations were calculated between measures of parenting environment (CAPI factor scores and KCHS Clinical Judgments Form scores) and overall Denver Advances, Cautions, and Delays scores at each age. See Table 2 below for descriptive statistics regarding all measures analyzed. Limiting the number of correlations run provided greater assurance that significant results were not chance effects. To further clarify, a total of 21 analyses were run for each time frame (7 measures of Belsky model variables—5 CAPI factor scores and 2 KCHS Clinical Judgments subscale scores X 3 measures of infant development—Denver Advances, Cautions, and Delays). At a significance level of .05, it would be expected by chance that one correlation would be significant ($21 \times .05 = 1.05$). As all results presented below demonstrated hypotheses supported with more than one correlation, the results can be seen as significant beyond what would be expected by chance. Correlations between subcategories of Advances, Cautions, and/or Delays (gross motor, fine motor, social, and language development) and

parenting environment measures were then calculated for those Denver-parenting measure pairings that yielded significant correlations in the first set of analyses. This procedure was used to determine which areas of infant development most accounted for the first results (see Appendix for all secondary-analysis correlations). For example, after a significant correlation between Time 1 CAPI Distress and Denver Cautions scores was found, correlations between Time 1 CAPI Distress and Denver Social Cautions, Language Cautions, Gross Motor Cautions, and Fine Motor Cautions were calculated. This procedure yielded the results discussed in this section.

Table 2: Descriptive Statistics for Measures Used in this Study

	<u>Sample Size (N)</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>Standard Deviation</u>
<u>Time 1:</u>					
CAPI Distress	151	0.00	261.00	94.37	75.11
CAPI Unhappiness	150	0.00	62.70	12.83	12.55
CAPI Problems with Child and Self	151	0.00	25.20	3.61	6.09
CAPI Problems with Family	151	0.00	38.00	11.00	12.31
CAPI Problems with Others	151	0.00	25.50	11.85	7.67
KCHS Parent Functioning Problems	84	1.00	4.25	2.33	0.82
KCHS Parent Problems (Abusive)	74	1.00	4.00	1.62	0.83
Denver Advances	146	0.00	21.00	1.31	2.29
Denver Cautions	146	0.00	5.00	0.54	0.95
Denver Delays	146	0.00	2.00	0.14	0.41
<u>Time 2:</u>					
CAPI Distress	151	0.00	255.09	79.91	71.33
CAPI Unhappiness	151	0.00	56.22	12.68	10.26
CAPI Problems with Child and Self	151	0.00	25.20	3.33	5.48
CAPI Problems with Family	150	0.00	38.00	11.10	12.95
CAPI Problems with Others	151	0.00	24.00	11.67	7.81
KCHS Parent Functioning Problems	78	1.00	3.88	2.08	0.70
KCHS Parent Problems (Abusive)	72	1.00	3.80	1.45	0.60
Denver Advances	147	0.00	13.00	1.53	1.83

Table 2, continued: Descriptive Statistics for Measures Used in this Study

	<u>Sample Size</u> <u>(N)</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>Standard</u> <u>Deviation</u>
Denver Cautions	147	0.00	5.00	0.75	1.07
Denver Delays	146	0.00	13.00	0.44	1.44
<u>Change Scores:</u>					
CAPI Distress	151	-150.18	170.00	14.46	55.90
CAPI Unhappiness	150	-35.00	45.60	0.10	12.22
CAPI Problems with Child and Self	151	-20.60	21.00	0.28	5.79
CAPI Problems with Family	150	-38.00	38.00	-0.14	12.48
CAPI Problems with Others	151	-14.00	19.00	0.18	6.10
KCHS Parent Functioning Problems	69	-1.33	2.23	0.30	0.68
KCHS Parent Problems (Abusive)	56	-1.30	3.00	0.38	0.87
Denver Advances	142	-13.00	10.00	0.20	2.57
Denver Cautions	142	-5.00	5.00	-0.20	1.32
Denver Delays	141	-11.00	2.00	-0.30	1.30

The Relationship Between CAPI Factor Scores and Infant Development.

Hypothesis 1: a.) The number of problems in infant development will be positively and significantly related to individual, familial, and community-level measures of parent and child dysfunctionality, both in the months immediately following the infant's birth and a year after this initial testing. b.) Increases in infant developmental problems between the months immediately following the infant's birth and a year after this initial testing will be significantly correlated with increases in these same measures of dysfunctionality.

Time 1 Analyses.

Table 3 shows the relationships between CAPI factor scores reflective of components of Belsky's ecological model for child maltreatment and Denver Advances, Cautions, and Delays at Time 1.

Table 3: Correlations between Time 1 CAPI Factor Scores and Denver Scores

Bold = Correlations significant at $p < .05$ level

	Denver Advances	Denver Cautions	Denver Delays
CAPI Distress	$r=.06$ $p=.50$	$r=.20$ $p=.02$	$r=.06$ $p=.46$
CAPI Unhappiness	$r=.05$ $p=.53$	$r=.08$ $p=.37$	$r=-.08$ $p=.35$
CAPI Problems with Child and Self	$r=-.01$ $p=.95$	$r=.12$ $p=.14$	$r=.08$ $p=.35$
CAPI Problems with Family	$r=.06$ $p=.51$	$r=.13$ $p=.13$	$r=-.05$ $p=.58$
CAPI Problems with Others	$r=.10$ $p=.24$	$r=.21$ $p=.01$	$r=.02$ $p=.81$

The above table illustrates significant relationships between CAPI Distress scores as well as CAPI Problems with Others scores and Denver Cautions. Additional correlations

between these CAPI factor scores and Denver Gross Motor Cautions, Fine Motor Cautions, Language Cautions, and Social Cautions were then calculated. For the CAPI Distress factor score, significant correlations were found with Denver Social Cautions ($r = .19, p < .05$) and Denver Language Cautions ($r = .20, p < .05$). For the CAPI Problems with Others factor score, a significant correlation was found with Denver Fine Motor Cautions ($r = .20, p < .05$). Thus, hypothesis 1a was partially supported for Time 1—as significant relationships between the parenting component of the individual level and the social support component of the community level of the Belsky model and infant development were found.

Time 2 Analyses.

Table 4 illustrates the relationships between CAPI factor scores representing components of Belsky's ecological model for child maltreatment and Denver Advances, Cautions, and Delays at Time 2.

Table 4: Correlations between Time 2 CAPI Factor Scores and Denver Scores

Bold = Correlations significant at $p < .05$ level

	Denver Advances	Denver Cautions	Denver Delays
CAPI Distress	$r = -.16$ $p = .05$	$r = .08$ $p = .33$	$r = .05$ $p = .57$
CAPI Unhappiness	$r = -.09$ $p = .27$	$r = .08$ $p = .37$	$r = .01$ $p = .94$
CAPI Problems with Child and Self	$r = -.11$ $p = .21$	$r = .18$ $p = .03$	$r = .20$ $p = .02$
CAPI Problems with Family	$r = -.06$ $p = .49$	$r = .11$ $p = .18$	$r = .13$ $p = .12$
CAPI Problems with Others	$r = -.05$ $p = .55$	$r = .12$ $p = .16$	$r = -.02$ $p = .85$

The above table first shows significant relationships between CAPI Distress factor scores and Denver Advances. In secondary analyses, no significant correlations were found between specific Denver Advances in infant development areas and CAPI Distress factor scores. The table also illustrates significant relationships between CAPI Problems with Child and Self factor scores and Denver Cautions. In secondary analyses, no significant correlations were found between specific Denver infant development areas and CAPI Problems with Child and Self factor scores. Finally, a significant relationship between CAPI Problems with Child and Self factor scores and Denver Delays was determined. Secondary analyses showed significant correlations between this factor score and Denver Gross Motor Delays ($r = .21, p < .05$) as well as Fine Motor Delays ($r = .17, p < .05$). Overall, hypothesis 1a for Time 2 was partially supported—as significant relationships between the parent and child components of Belsky’s model and infant development were found.

Change Score Analyses.

Table 5 reports correlations between changes in CAPI factor scores between times 1 and 2 and changes in Denver Advances, Cautions, and Delays between times 1 and 2.

Table 5: Correlations between Changes in CAPI Factor Scores and Changes in Denver Scores from Time 1 to Time 2 (all calculated so larger scores corresponded to more problems)

Bold = Significant correlations at $p < .05$ level

	Denver Advances	Denver Cautions	Denver Delays
CAPI Distress	$r=.09$ $p=.28$	$r=.24$ $p=.00$	$r=.11$ $p=.20$
CAPI Unhappiness	$r=.03$ $p=.76$	$r=.13$ $p=.12$	$r=.03$ $p=.71$
CAPI Problems with Child and Self	$r=.020$ $p=.82$	$r=.20$ $p=.02$	$r=.05$ $p=.57$
CAPI Problems with Family	$r=.01$ $p=.89$	$r=.05$ $p=.59$	$r=.12$ $p=.15$
CAPI Problems with Others	$r=.04$ $p=.64$	$r=.07$ $p=.42$	$r=.01$ $p=.94$

This table first shows a significant relationship between CAPI Distress factor scores and Denver Cautions. Further analyses yielded that this correlation partially resulted from significant correlations between changes in this factor score and changes in Denver Social Cautions ($r = .20, p < .05$) and changes in Denver Language Cautions ($r = .21, p < .05$). In addition, there was a significant relationship between CAPI Problems with Child and Self factor scores and Denver Cautions, partially made up of a significant correlation between this factor score and Denver Social Cautions ($r = .21, p < .05$). Thus, hypothesis 1b was partially supported for change scores—with significant relationships between the parenting and child components of the individual level of Belsky’s model being evinced.

The Relationship Between KCHS Clinical Judgments Form Scores and Infant Development.

Hypothesis 2: a. More problems in infant development will be significantly related to higher scores on the KCHS Clinical Judgments form—an observational measure of parent-related individual factors. b. Increases in infant developmental problems between Time 1 and Time 2 will be significantly correlated with increases in scores on the KCHS Clinical Judgments form.

Time 1 Analyses.

Table 6 details results for correlations between KCHS Clinical Judgments Form subscale as well as total scores and Denver Advances, Cautions, and Delays at Time 1.

Table 6: Correlations between Time 1 KCHS Clinical Judgments Form and Denver Scores

Bold = Correlations significant at $p < .05$ level

	Denver Advances	Denver Cautions	Denver Delays
Clinical Judgments Parent Functioning Problems	$r = -.28$ $p = .01$	$r = .24$ $p = .03$	$r = .15$ $p = .19$
Clinical Judgments Problems (Abusive Behaviors)	$r = -.15$ $p = .21$	$r = .02$ $p = .85$	$r = .09$ $p = .45$

The table first shows a significant correlation between the KCHS Clinical Judgments Parent Functioning Problems score and Denver Advances. Secondary analyses illustrated that this correlation was partially accounted for by significant relationships between this KCHS subscale and Denver Social Advances ($r = -.22, p < .05$) as well as Denver Fine Motor Advances ($r = -.42, p < .05$). In addition, a significant correlation was ascertained between the KCHS Clinical Judgments Parent Functioning Problems score and Denver Cautions. Secondary analyses demonstrated that a significant relationship between this

KCHS subscale and Denver Gross Motor Cautions ($r = .27, p = .05$) was a salient part of the preliminary finding. In general, these results partially support hypothesis 2a for Time 1. Individual parent functioning problems that were not found in overtly abusive homes as tapped by the KCHS Clinical Judgments form were found to relate to infant development.

Time 2 Analyses.

Table 7 outlines the findings for KCHS Clinical Judgments Form subscales at Time 2.

Table 7: Correlations between Time 2 KCHS Clinical Judgments Form Scores and Denver Scores

Bold = Correlations significant at $p < .05$ level

	Denver Advances	Denver Cautions	Denver Delays
Clinical Judgments Parent Functioning Problems	$r = -.28$ $p = .01$	$r = .22$ $p = .05$	$r = .13$ $p = .25$
Clinical Judgments Problems (Abusive Behaviors)	$r = -.09$ $p = .48$	$r = .03$ $p = .81$	$r = .05$ $p = .70$

The above table illustrates one significant correlation for Time 2: the relationship between KCHS Clinical Judgments Parent Functioning Problems and Denver Advances. Secondary analyses supported that this KCHS subscale's relationships with Denver Social Advances ($r = -.29, p < .05$) and Gross Motor Advances ($r = -.23, p < .05$) accounted for a significant part of its overarching relationship with Denver Advances. Thus, hypothesis 2a was partially supported for Time 2, as nonabusive parenting problems measured by the KCHS Clinical Judgments Form were related to whether infants exceeded developmental standards for their age.

Change Score Analyses.

Table 8 shows correlations between changes in KCHS Clinical Judgments Form subscale scores between times 1 and 2 and changes in Denver Advances, Cautions, and Delays scores between times 1 and 2.

Table 8: Correlations between Changes in KCHS Clinical Judgments Form Scores and Changes in Denver Scores from Time 1 to Time 2 (all calculated so larger scores represent more problems)

Bold = Correlations significant at $p < .05$ level

	Denver Advances	Denver Cautions	Denver Delays
Clinical Judgments Parent Functioning Problems	$r = -.01$ $p = .91$	$r = .17$ $p = .19$	$r = .12$ $p = .34$
Clinical Judgments Problems (Abusive Behaviors)	$r = -.02$ $p = .89$	$r = -.02$ $p = .89$	$r = .15$ $p = .28$

The above table illustrates that, as measured by the KCHS Clinical Judgment Form subscale scores, there were no significant relationships between parenting and infant development. Thus, hypothesis 2b was not supported.

The Role of Ethnicity and Age in Potentially Abusive Environments.

Hypothesis 3: Any significant relationships between ethnicity/culture and parents' age, and infant development scores at times one and two—as well as changes in these scores between the months immediately following the infant's birth and a year after this initial testing—will be an artifact of the relationship between measures of all components of Belsky's ecological model and infant development scores.

The initial premise upon which these analyses were based—the existence of significant relationships between both ethnicity as well as age and Denver Advances,

Cautions, and Delays—was not supported beyond what would occur by chance. Analyses of time 1, time 2, and change score correlations yielded only one significant relationship: that between ethnicity and time 2 Denver Advances. No significant relationships were determined between teenage status and Denver variables at any time. As one significant correlation would be expected out of 18 analyses with an alpha of .05 ($18 \times .05 = .9$), the significant correlation for the ethnicity variable can be ruled out as “statistical dust.” Thus, hypothesis 3 was not supported due to it not being testable.

Chapter 4: Discussion

The results of this study provided partial support for its hypothesis that infant development in the first year of life is related to specific individual-, familial-, and community-level components of Belsky's ecological model for child maltreatment, as assessed by the CAPI factor scores and the KCHS Clinical Judgments form. The individual level of the Belsky model, in particular, was salient across all time frames as playing a crucial role in infant development outside of actual abusive incidents. In order to best elucidate the extent to which the Belsky model was supported in this study, results will be discussed in relation to each level.

The Individual Level: Parenting Component

This study provided substantial support for the constructs tapped by the parenting component of the individual level of child maltreatment as impacting infant development in the first year of life outside of actual abusive incidents. This evidence was obtained from two veins: a.) the significant correlations found at times 1, 2, and for change scores between the CAPI Distress score and Denver variables and b.) the significant relationships determined at times 1 and 2 between the KCHS Clinical Judgments Parent Functioning Problems subscale and Denver infant development scores. Interestingly, there is a degree of overlap between the constructs assessed by the CAPI Distress factor score and the KCHS Clinical Judgments Parent Functioning Problems subscale. For example, both the CAPI Distress and KCHS Clinical Judgments Parent Functioning Problems subscale contain items addressing maternal ability to manage anger,

stress/anxiety, and feelings of depression. Thus, it can be postulated that such affects engender delays in infant development in potentially—but not actually—abusive environments. However, notably, the KCHS Clinical Judgments Parent Functioning Problems subscale also assesses parenting variables not measured by the CAPI Distress factor score, primarily those related to parental knowledge of appropriate child-rearing practices (e.g., "Excessive need for child to obey or comply," "Inaccurate sense of child's needs," etc.). Therefore, this study's results implicate mothers' understanding of their roles as parents as an important individual-level variable to factor into assessments of parents' contributions to infant development in potentially abusive environments.

Another interesting finding is that there were no significant correlations between KCHS Clinical Judgments Problems (Abusive Behaviors) subscale scores and infant development found for any time frames assessed. These findings strongly implicate maternal behaviors outside of actual abusive/neglectful actions as being responsible for negative effects on infant development. This result should be examined in actually abusive homes, however, before it can be fully stated as fact.

The pattern of specific Denver subscales with which the above maternal parenting measures were significantly associated lends credence to the study's initial claims that effects of maternal problems on infant development are manifested across different developmental tasks. For instance, at Time 1, significant relationships between Denver Cautions, Social and Language Cautions and the CAPI Distress factor score, as well as between the KCHS Clinical Judgments Parent Functioning Problems subscale and Denver Advances, Cautions, Social Advances, Fine Motor Advances, and Gross Motor Cautions are suggestive of impacts of individual maternal variables across all significant

infant developmental areas the Denver measures. The fact that there were correlations between parenting measures and broad-based Denver Advances and Cautions variables—which incorporate gross and fine motor, language, and social development totals—implicates these variables as generally having a holistically negative effect on infant development. Especially detrimental effects are supported for the areas determined through secondary analyses to be significant. Thus, for Time 1, the above-mentioned specific correlations with social, language, and gross and fine motor development further advance the hypothesis that impacts are found in all major infant developmental areas.

Similarly, the significant relationships found at Time 2 between CAPI Distress factor scores and Denver Advances overall, as well as between KCHS Clinical Judgments Parent Functioning Problems subscale scores and Denver Advances, support wide-ranging effects on infant development. The secondary-analysis correlations between KCHS Clinical Judgments Parent Functioning Problems subscale scores and Denver Social and Gross Motor Advances suggest particularly strong effects on these two areas. Thus, social and gross motor difficulties should be targeted at around one year in families with significant maternal problems.

Finally, the significant relationships between changes in CAPI Distress factor scores and changes in Denver Cautions between times 1 and 2 imply that effects of affective maternal traits are both major and intertwined across the first year of life. Secondary analyses bring out that especially detrimental effects on social and language development are associated with these variables during this time frame. In sum, results for Times 1, 2, and change scores lend support to effects of the parenting component of Belsky's individual level on infant development, both holistically and most saliently for

certain specific areas of infant development that vary depending on the time frame assessed.

Another important point for exploration is that different significant correlations were found between the CAPI Distress factor score vs. the KCHS Clinical Judgments Parent Functioning Problems subscale score and Denver measures. These discrepancies are suggestive of differential effects of parenting variables on varying aspects of infant development—as there are different parenting variables tapped by the two measures, as mentioned above. In addition, no significant relationships were found at times 1, 2, or for change scores between CAPI Unhappiness factor scores—another designated measure of the parenting component of Belsky's individual level—and infant development. Thus, it appears that, during the first year of life, maternal depressive symptomatology assessed in isolation from other parenting variables is not related to maladaptive infant development in homes with strong physical abuse potential. However, the fact that significant relationships were found between CAPI Distress as well as KCHS Clinical Judgments Parent Functioning Problems scores—which notably incorporate depressive symptomatology as part of the constructs they measure—and infant development suggests that depression may still affect infant development in such homes as those tested in this study. Its impact may not occur outside of its interaction with other parenting problems, such as anxiety, anger management, and knowledge of child development, however. Further research is needed to partial out in more detail and with more measures from multiple informants how separate components of the parenting aspect of the individual level of Belsky's model affect various aspects of infant development in the first year of life, however, before such suppositions can be accepted as empirical fact.

The Individual Level: Child Component.

The results elucidating the infant's contribution to his/her own development—the child component of the individual level of Belsky's ecological model—are illustrative of significant impacts at Time 2 and throughout the first year (as measured by change scores between times 1 and 2), but not at Time 1. The significant correlation between CAPI Problems with Child and Self factor scores and Denver Delays at Time 2 is suggestive of broad-ranging delays in infant development after a year being related to difficult-to-manage child traits. This effect would seem to be particularly salient for gross and fine motor development, as secondary analyses yielded significant results for delays only in these areas. Regarding change score results, the significant relationship found between increases in CAPI Problems with Child and Self factor scores and more Denver Cautions across the first year reflects infant characteristics' general effects on their own development. Secondary analyses showed that this effect is particularly attributable to infant traits' impacts on their own social development during the first year. Thus, overall, this aspect of Belsky's model garnered support in this study. Finally, the fact that correlations were found between social and gross and fine motor development—but not language development—implicate the former three areas as most impacted by hard-to-manage infant traits, as well as that this variable has broad-ranging effects across multiple developmental tasks.

In general, the above findings provide evidence that in potentially abusive homes, problematic infant traits contribute to an environment facilitative of developmental deficiencies. However, the fact that no effects were found at Time 1 warrants further

explanation. Previous literature supports such results. For instance, several researchers have found that temperament levels during the few months predict infant development at one year (e.g., Belsky, Rovine, & Taylor, 1984; Egeland & Farber, 1984), as well as concurrent effects of infant temperament on development at one year (e.g., Calkins & Fox, 1992; Wachs & Desai, 1993). These studies suggest that temperamental effects will not be seen unless infant development at one year is factored into analyses—which is exactly what this study's findings evinced. The results for Time 2 mirror findings regarding concurrent effects at one year. Change score analyses are illustrative of how interrelated temperament and infant development are during the first year, which predictive analyses implicate, as well. Thus, this study's results are reflective of the larger infant temperament knowledge base.

The Familial Level of Belsky's Ecological Model.

No significant correlations were found between Problems with Family CAPI factor scores and infant development for times 1, 2, or change scores. These findings are surprising in light of the preponderance of evidence supporting unhealthy familial dynamics' effects on infant development cited above. Such results imply that overarching familial dynamics factor into the dynamics of abusive situations to a level facilitative of impairment only in situations where actual abuse occurs, a conclusion contrary to the basic hypothesis of this study.

The Community Level of Belsky's Ecological Model.

Results gleaned from Problems with Others CAPI factor scores—the primary measure of social support/community-level influences utilized in this study—evidenced significant impacts only at Time 1. Findings showed that lack of an external support system affects infant development generally, as represented by its significant correlation with Denver Cautions. The fact that secondary analyses yielded a correlation with Fine Motor Cautions implicates especially harmful impacts of unsatisfactory social support on newborn infants' ability to control fine motor movements. It would appear that fine motor development's relationship with social support is especially strong—as no other areas of infant development yielded significant findings. Overall results for this factor score are particularly salient in that correlations were found with Denver Cautions, illustrative of halted development. Interestingly, the results contrast the above-cited body of literature, which mainly reported impacts of social support at around one year (e.g., Crockenberg, 1981). Thus, it appears that more research is needed to further explicate the role of social support in infant development—particularly in the fine motor area—early in infancy. Also, these findings lend support to the supposition that social support is associated with maladaptive infant development during and at around one year only in homes where actual abuse occurs, a finding contrary to expected results.

The Role of Ethnicity and Age.

As stated above, the absence of significant relationships between race as well as teenage status and Denver scores reflects that such variables did not have tangible effects on infant development in this sample. These results are surprising in light of the

heterogeneous sample employed in this study, both regarding age and ethnicity. A potential reason for such findings is that the Denver Developmental Screening Test II, which functions as a screening measure for developmental dysfunction, was not as adept at picking up ethnic and age effects. Such findings may have been present, but not in such a manner that they impacted infant development to the level that infants showed delays that placed them behind 75 to 90% of their peers, or prevented them from advancing ahead of more than 75% of them (e.g., they may have been held back behind 50% of their peers, etc.). As literature examining the relationship between the Denver Developmental Screening Test II's relationship to age and ethnicity is virtually nonexistent, this hypothesis is difficult to corroborate. Such research is needed in the future to better elucidate the nature of these variables' effects on infant development in the infant's earliest years, when such impacts can be most salient.

Summary.

In sum, the pattern of results obtained from this study lend partial support to its overarching hypothesis that problems inherent in the individual, familial, and community levels of Belsky's ecological model for child maltreatment have negative effects on infant social, motor, and language development in homes with a high potential for physical abuse. The parenting component of the individual level was determined to have effects on all salient areas of infant development at all investigated time frames, and the child component demonstrated impacts in changes during the first year and upon completion of the infant's first year of life. Therefore, it appears that individual characteristics—with the notable exception of depression, as highlighted above—can produce harmful effects

on infants in homes where the potential for abuse does not escalate to the level of actual abusive behaviors. Similar results were found only for the time frame near birth for Belsky's community level, and not at all for his familial level. Thus, this study suggests that in order to ameliorate infant development in potentially abusive homes, mothers' individual emotional and child-rearing difficulties and the extent of their external support systems should be addressed at around the time of infants' birth, and mothers' difficulties as well as hard-to-manage infant traits should be targeted throughout the first year.

Also notable was the pattern in which significant results were found. When viewed from a developmental perspective, individual parent variables' and social support variables' effects were salient from birth, while child variables' effects began to manifest themselves as the infant developed across the first year. Thus, it appears that infants' influence becomes more significant, while that of external support systems becomes less significant, as infants grow and develop into more autonomous individuals. Studying this population for a longer time frame might potentially evidence effects for familial-level variables that had not had developmental impacts during the first year. Thus, further research should explore potential interactions between lack of adequate parenting skills as well as support systems and the time as well as severity of the beginning and manifestation of hard-to-manage infant traits to ascertain if such traits may appear in response to the harms such infants' development begins with.

In general, assisting mothers with these life difficulties should help infants develop in a more healthy fashion. Such aid will benefit infants in all developmental areas, as secondary analyses across all individual-level variables and time frames showed significant relationships with gross and fine motor, social, and language development.

As familial factors in general and community-level factors after birth did not evidence effects, it seems likely that these levels of Belsky's model are more salient and should be addressed in homes where physical abuse is present. However, testing a sample with documented physical abuse is needed to verify such a hypothesis.

There are several other shortcomings that warrant further research to remedy. First, this research was conducted only with mothers. Exploration of similar variables with fathers would allow for a fuller picture of the dynamics of potentially abusive households and how these relate to infant development to be obtained. Second, although infants were tested at approximately birth and again at approximately one year, there was variation in infants' ages around these time frames. In the rapidly-changing world of infant development where a month is associated with vast developmental gains, a sample with less variance in age at each time frame would make it easier to attribute effects to specific developmental stages. Third, utilizing more measures of parenting variables and particularly infant development (where the Denver was the only measure employed) would further substantiate the findings reported here. In general, this study has demonstrated how certain traits of potentially abusive homes—particularly of the individuals in them—can engender the same unhealthy developmental outcomes during the first year of life as actually abusive homes can.

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APPENDIX

Table 9: Secondary Analysis Correlations for Significant Results from Broad Denver Scales (Advances, Cautions, and/or, Delays) (Bold correlations are significant at $p < .05$ level)

	<u>1st Set of Significant Correlations</u>	<u>2nd Set of Significant Correlations</u>
<u>Time 1:</u>		
CAPI Distress	<u>Denver Cautions:</u> Social $r = .19$ Fine Motor $r = .08$ Language $r = .20$ Gross Motor $r = .09$	
CAPI Problems with Others	<u>Denver Cautions:</u> Social $r = .13$ Fine Motor $r = .20$ Language $r = .09$ Gross Motor $r = .15$	
Clinical Judgments Parent Functioning Problems	<u>Denver Advances:</u> Social $r = -.22$ Fine Motor $r = -.42$ Language $r = -.06$ Gross Motor $r = -.12$	<u>Denver Cautions:</u> Social $r = .17$ Fine Motor $r = .13$ Language $r = .13$ Gross Motor $r = .27$
<u>Time 2:</u>		
CAPI Distress	<u>Denver Advances:</u> Social $r = -.15$ Fine Motor $r = -.08$ Language $r = -.04$ Gross Motor $r = -.10$	
CAPI Problems with Child and Self	<u>Denver Cautions:</u> Social $r = .05$ Fine Motor $r = .07$ Language $r = .16$ Gross Motor $r = .13$	<u>Denver Delays:</u> Social $r = .10$ Fine Motor $r = .17$ Language $r = .08$ Gross Motor $r = .21$
Clinical Judgments Parent Functioning Problems	<u>Denver Advances:</u> Social $r = -.29$ Fine Motor $r = -.12$ Language $r = -.11$ Gross Motor $r = -.23$	

**Table 9, continued: Secondary Analysis Correlations for Significant Results from
Broad Denver Scales (Advances, Cautions, and/or, Delays)**

	<u>1st Set of Significant Correlations</u>	<u>2nd Set of Significant Correlations</u>
<u>Change Scores:</u>		
CAPI Distress	<u>Denver Cautions:</u> Social $r = .20$ Fine Motor $r = .13$ Language $r = .21$ Gross Motor $r = .12$	
CAPI Problems with Child and Self	<u>Denver Cautions:</u> Social $r = .21$ Fine Motor $r = .08$ Language $r = .06$ Gross Motor $r = .10$	

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