HOME ENVIRONMENTS AND DEVELOPMENTAL OUTCOMES OF CHILDREN BORN TO TEENAGE MOTHERS

by

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(ABSTRACT)

This study examined the role of home environments in the cognitive and behavioral outcomes of children born to teenage mothers. The sample consisted of 1,011 firstborn children aged 6 to 18 and their mothers selected from the 1990 National Longitudinal Survey of Youth (NLSY). Multivariate regression analyses revealed that the quality of home environments mediated the effects of father presence on the behavioral adjustment of children, even taking other socio-demographic and maternal characteristics into account. Moreover, the results showed that the home environment was the best predictor for both the academic achievement and the behavioral problems of children even after controlling for such background factors as family income, number of children, maternal education, and self-esteem. Also, when other variables in the model were statistically accounted for, the mothers' age at first birth was unrelated to the quality of home environments, and with controlling for the home environment, it was not a significant predictor of either the cognitive attainment or the behavioral adjustment of children. The findings evidence the importance of home environments for the optimal development of children, and suggest that

strong home environments contribute to prevent potential negative outcomes and promote positive developmental outcomes of children born to teenage mothers.

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"I will praise you with all my heart,
glorify your name forever, Lord my God."

(Psalms 86:12)

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CHAPTER I: INTRODUCTION

Teenage childbearing and parenthood have been a subject of social concern over the last two decades. It is estimated that almost half a million children (about 13% of all births and a quarter of all first births in the United States) are born to teenage mothers each year (U.S. Bureau of the Census, 1995), and that the majority (over 90%) of these children are being raised by their mothers (Hayes, 1987; Roosa, 1991). Although birthrates for teenage mothers declined during the 1970s and remained steady throughout the 1980s (Furstenberg, 1991), they began to increase again in the late 1980s (Baldwin, 1993; Lewit, 1992). More importantly, problems related to teenage parenthood, particularly the impact of teenage parenting on child development, have been increasingly noticed in recent years (Chase-Lansdale, Brooks-Gunn, & Paikoff, 1991; Chase-Lansdale, Mott, Brooks-Gunn, & Phillips, 1991; Furstenberg, Brooks-Gunn, & Chase-Lansdale, 1989).

Teenage mothers are often described as inadequate or ineffective parents who provide poor and/or inappropriate environments that produce negative consequences for the development of children. Research on parenting of teenage mothers has suggested that parental behaviors of teenage mothers do differ from those of older mothers (Elster, McAnarney, & Lamb, 1983). Most of earlier studies, however, focused on teenage mothers' behaviors in the context of mother-infant interaction (McAnarney, Lawrence, Ricciuti, Polley, & Szilagyi, 1986), as well as compared the characteristics of teenage mothering to those of older mothering (Culp, Culp, Osofsky, &

Osofsky, 1991; Garcia Coll, Hoffman, & Oh, 1987; Garcia Coll, Hoffman, Van Houten, & Oh, 1987; Garcia Coll, Vohr, Hoffman, & Oh, 1986; Levine, Garcia Coll, & Oh, 1985; Schilmoeller & Baranowski, 1985). These studies have generally concluded that teenage mothers tend to be less verbal in interactions with their infants than older mothers; however, those studies failed to clarify consequences of the differences for the development of children born to teenage mothers.

In contrast to many studies on teenage mothers, only a few studies have looked at their children and attempted to examine links between parenting practices of teenage mothers and child outcomes. In a recent review of the literature on adolescent mothers, Chase-Lansdale and her colleagues (1991) stressed this missing point of the research, arguing that "given the fact that teenage mothers and their children represent a recent interest among child development scholars, exceedingly few studies have looked at how adolescent mothers actually treat their children" (p. 398). Since the late 1980s, indeed, some researchers concerned with the effects of adolescent parenthood on children have begun to assess teenage parenting with emphasis on the child's developmental outcomes. They have indicated that children of teenage mothers are at greater risk for cognitive, social, emotional, and behavioral problems (Hechtman, 1989; Whitman, Borkowski, Schellenbach, & Nath, 1987).

The available studies have suggested that children born to teenage mothers are more likely to have low intellectual and academic achievement (Barratt, 1991; Dubow & Luster, 1990; Moore & Snyder, 1991) and to have more social behavioral problems than other children (Hubbs-Tait, Osofsky,

Hann, & Culp, 1994; Kandel, Rosenbaum, & Chen, 1994; Leadbeater & Bishop, 1994). These studies, however, seem to focus on *either* factors contributing to parenting and/or child outcomes *or* exclusively on child adjustment in order to see developmental problems (i.e., cognitive or behavioral difficulties) of children born to teenage mothers, rather than explain *how* such developmental outcomes of those children occur. In other words, no study has directly addressed parenting processes as possible explanations for developmental differences in children of teenage mothers.

Researchers interested in teenage parenting have, in fact, rarely assessed the effects of the quality of home environments as a process measure of parenting on the child's developmental outcomes, even though there has been sufficient evidence that home environments profoundly influence children's cognitive (Bradley, Caldwell, Rock, Ramey, Barnard, Gray, Hammond, Mitchell, Gottfried, Siegel, & Johnson, 1989; Bradley, Caldwell, & Rock, 1988; Bradley & Caldwell, 1984b; Gottfried, 1984; Ketterlinus, Henderson, & Lamb, 1991) and behavioral (McLeod & Shanahan, 1993; Parcel & Menaghan, 1993; Rogers, Parcel, & Menaghan, 1991) development. Several studies have also found that children of teenage mothers live in less stimulating and less responsive environments (Garcia Coll et al., 1986, 1987; Luster & Rhodes, 1989; Schilmoeller & Baranowski, 1985). Still, the role that home environments play, at least partly (cf: Harnish, Dodge, & Valente, 1995), in mediating the relation between teenage motherhood and child development has been neglected in the research on teenage mothers and parenting. It is little known, therefore, whether and to what extent, if any, the effects of teenage motherhood on child outcomes are

mediated by the quality of home environments teenage mothers provide for their children.

Furthermore, the existing studies of teenage mothers and their children have been limited not only to the infancy (and preschool) period but to the particular age range of children, which causes a gap in the literature of this area. Given the fact that developmental differences of children born to teenage versus older mothers become more pronounced as the children grow older (Furstenberg, Brooks-Gunn, & Morgan, 1987; Chase-Lansdale, Mott et al., 1991), it seems important to examine the effects of teenage motherhood and parenting on children at different developmental stages, particularly those beyond the early childhood period (Franklin, 1988).

In addition, few research has focused on factors (Dubow & Luster, 1990) or mechanisms (Rutter, 1987) that may prevent negative outcomes of these children and promote their possible optimal outcomes, though there has been indication that not all the children of teenage mothers are at the same risk of developmental problems (Ketterlinus et al., 1991; Ruch-Ross, Jones, & Musick, 1992). It is, in fact, critical to know how and why some of the children are at greater (or less) risk for developing problems, considering there is substantial variation in teenage mothers and their child outcomes (Chase-Lansdale et al., 1991; Roosa & Vaughan, 1984). For instance, addressing how much of the disadvantage (e.g., poverty status) associated with early parenthood (Furstenberg et al., 1987; Hayes, 1987) is mitigated if a teenage mother provides rich home environments for her child, may be an important inquiry for a better understanding of processes leading to the child's development (cf: Astone, 1993).

Theoretical Background

Why/How Would Teenage Motherhood and Parenting Matter to Child?

Teenage motherhood proposed by Brooks-Gunn and Furstenberg (1986, 1987; Furstenberg et al., 1987) explicates the characteristics of teenage mothers and their relations to parenting practices and child developmental outcomes. Overall, arguing that teenage motherhood causes problems for both the mother and her child, this view explains why parenting of teenage mothers is affected by their early parenthood (i.e., socially and economically disadvantaged status) and how their children's development is affected by that parenthood. According to Furstenberg and his colleagues, teenage mothers are at risk for lower educational attainment and poorer economic conditions than mothers who give their first birth at later ages, and these underdesirable social, economic consequences are associated with not only undesirable maternal behaviors but also with lower academic achievement and more behavioral problems of their children (Furstenberg et al., 1989; Furstenberg, Levine, & Brooks-Gunn, 1990).

Much of the research based on teenage motherhood has documented differences in parenting practices and differences in child outcomes in terms of social, economic, educational, and marital status of teenage mothers as well as their family structure. As teenage mothers are more likely to have low levels of education, poor employment, low income, high fertility, single motherhood (or unstable marriages), and social support (Furstenberg et al., 1987; Hayes, 1987), they are more likely to exhibit inadequate parental practices (e.g., less responsive to children) and to provide less optimal (e.g., less stimulating) child-rearing environments (Garcia Coll et al., 1986, 1987;

Garrett, Ng'andu, & Ferron, 1994; Ruch-Ross et al., 1992), and thus to have children who show developmental deficits in the cognitive and behavioral domains (Baldwin & Cain, 1981; Hofferth, 1987; Simkins, 1984). It is predicted, therefore, that background factors such as family structure, socioeconomic variables, child and maternal characteristics, affect both parenting of teenage mothers and developmental outcomes of their children.

Maintaining that parental input is a critical factor contributing to child outcomes, Bradley and Caldwell (1984a; Bradley et al., 1989; Caldwell & Bradley 1984) have suggested a theory of environment/development relationships that emphasizes the relationship between the quality of home environments and child development across the various age groups. According to their model of optimal parenting environment (Bradley, 1995), parents provide inputs that are designed to sustain, stimulate, and support the child's optimal development, and the parental inputs would effect a good fit between the child and the environment. In the light of this view, competent mothers may provide their children with rich environmental experiences including availability of stimulating materials and supportive responses to children. In other words, mothers who provide age-appropriate cognitive experiences and stimulation would be more beneficial to the child than mothers who do not. Mothers who provide proper responses and emotional support would also promote the child's positive development. These differences in parenting practices seem to, in large part, contribute to differences in child outcomes (Bradley et al., 1988, 1989).

Studies of teenage parenting have, in fact, considerably reported that children's home environments influence their intellectual/academic and social behavioral competence. Home environments that provide appropriate levels of cognitive stimulation and sufficient levels of maternal warm responses to children are related to better cognitive performance (Barratt, 1991; Dubow & Luster, 1990; Ketterlinus et al., 1991; Moore & Snyder, 1991) and to fewer behavioral problems (Dubow & Luster, 1990; Kandel et al., 1994; Unger & Cooley, 1992). It is hypothesized, therefore, that some of adverse cognitive and behavioral outcomes of children born to teenage mothers are due to their mothers' inadequate and less than optimal parenting and home environments.

Relations of Teenage Parenting and Child Development

Earlier work has reported that teenage mothers show less positive attitude, less sensitivity, and fewer vocalizations to their infants than older mothers (Culp et al., 1991; Garcia Coll et al., 1987; McAnarney et al., 1986). Some studies, however, suggest that not only maternal age but other social factors (e.g., maternal education, SES, marital status, family composition, etc.) mediate the negative characteristics of teenage mothers' parenting (Garcia Coll et al., 1986, 1987; Levine et al., 1985). Barratt and Roach's (1995) recent study with infants of Caucasian single mothers supports the earlier findings of parenting differences between teenage and older mothers, and Roosa and Vaughan's (1984) study with preschool children also evidenced the differences in backgrounds, parenting knowledge and attitudes (Reis & Herz, 1987) which all favored older mothers.

In general, mothers with more family stressors and fewer social supports tend to exhibit less positive parenting behaviors (Menaghan & Parcel, 1991, 1995). Recently, Luster and Dubow (1990) attempt to identify predictors of the quality of teenage parenting, and suggest that young mothers who have low education/intelligence, poor income, many children, low self-esteem, parents with low education, and no spouse and/or mother living in her household, are more likely to be at risk for providing less positive home environments. Other studies have reported similar findings, with younger mothers showing less supportive parenting (Conger, McCarty, Yang, Lahey, & Burgess, 1984; Ragozin, Basham, Crnic, Greenberg, & Robinson, 1982; Reis & Herz, 1987), with highly educated mothers affording more stimulating home environments (Bradley & Caldwell, 1984c; Ketterlinus et al., 1991), and with mothers in poverty providing lower quality of home environments (Garrett et al., 1994; McLeod & Shanahan,1993; McLoyd, 1990).

Regarding relationships among family and/or maternal conditions, parenting, and child developmental outcomes, research has significantly reported the effects of poverty (McLeod & Shanahan, 1993), undesirable socio-demographic characteristics (Rogers et al., 1991), and low maternal resources (Parcel & Menaghan, 1993) on mothers' less positive parenting practices which are then associated with children's behavior problems. Recent studies of children born to teenage mothers also indicate the negative impact of poor conditions on the mothers' parenting and home environments, which subsequently leads to the children's less optimal cognitive and behavioral development (Barratt, 1991; Dubow & Luster, 1990; Moore &

Snyder, 1991). It draws, therefore, that the parenting behaviors of teenage mothers influenced by their circumstances substantially affect the child's development.

Purpose of the Study

The purpose of this study was to examine relations among child, family, and maternal characteristics, the quality of home environments, and the developmental outcomes of children born to teenage mothers. In particular, this study attempted to assess the extent to which the quality of home environments (e.g., cognitive stimulation and emotional support provided in the home) as a process of parenting, can help explain the relationship between each of the child, family, and maternal characteristics and the cognitive and behavioral outcomes of children.

The role of home environments was proposed as a partial mediator since parenting is a complex function of multiple factors (Belsky, 1984), and thus other parenting behaviors and/or socialization aspects which are not assessed in this study may also contribute to the child developmental outcomes. It was, then, hypothesized that the direct effects of child, family, and maternal characteristics on the cognitive and behavioral outcomes of children will be reduced by somewhat when the home environment is included in the analysis. Specifically, the present study examined the following questions:

1. How does each of the child, family, and maternal characteristics influence the quality of home environments that the mothers who were teenagers at the time of first birth provide for their child?

2. How is the quality of home environments related to the cognitive and behavioral outcomes of children who were born to teenage mothers?
3. How does each of the child, family, and maternal characteristics influence the child's cognitive and behavioral outcomes?
4. Does the quality of home environments mediate the relation between the child, family, and maternal characteristics and the child's developmental outcomes? If does, to what extent the quality of home environments explains the relationship between each of the child, family, and maternal characteristics and the cognitive and behavioral outcomes of children?

Proposed Study Framework

Based on a review of the literature on teenage motherhood, parenting, and child outcomes, a study framework was proposed. Figure 1 shows a graphic summary of the variables and relationships among the variables involved in the present study. Overall, it was proposed that the quality of home environments teenage mothers provide for their child is a function of the child, family, and maternal characteristics, and that the developmental outcomes of children born to teenage mothers are considered to be a function of not only the child, family, and maternal characteristics, but also the quality of home environments such as cognitive stimulation and emotional support provided by teenage mothers.

Insert Figure 1 here

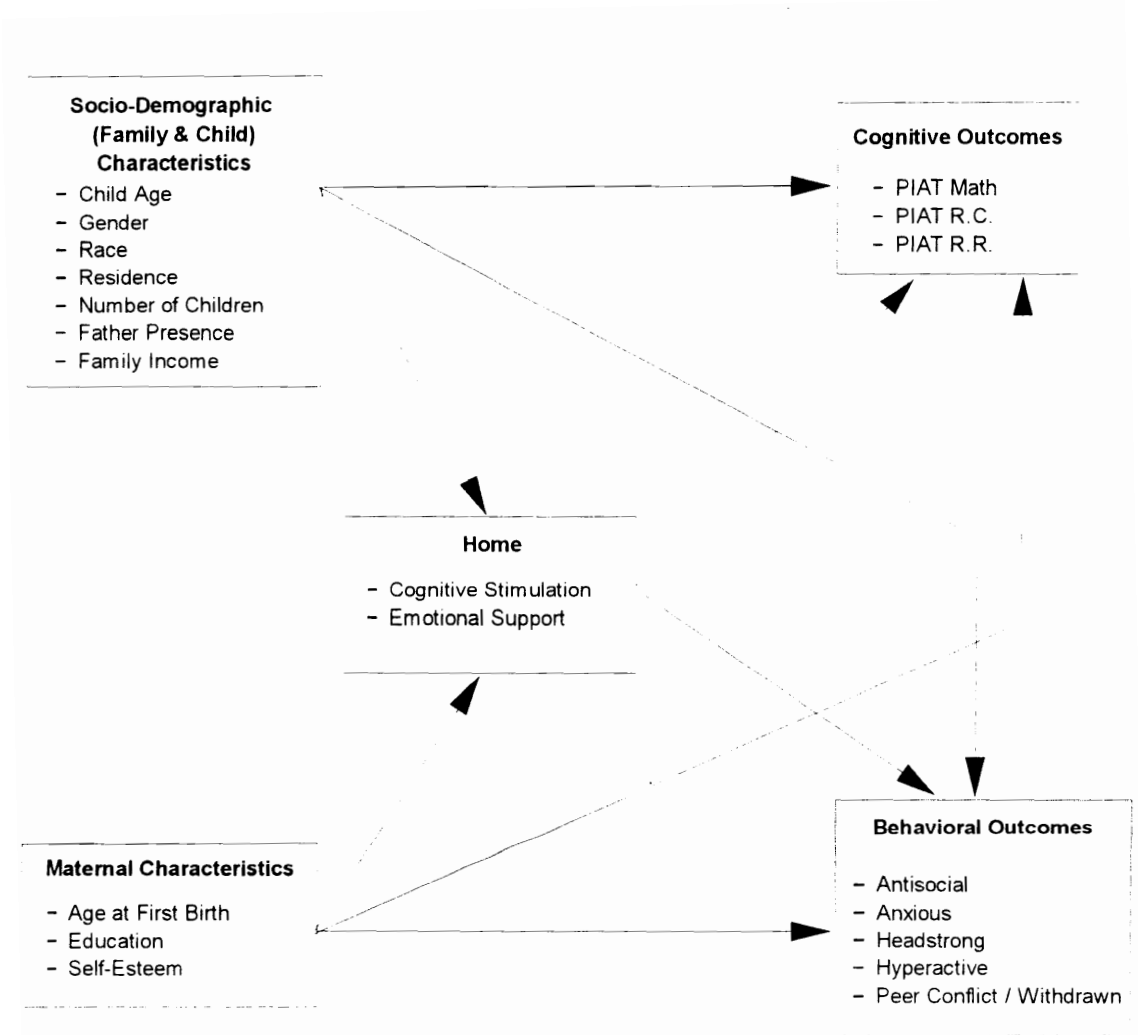

Figure 1. Proposed Study Framework

CHAPTER II: LITERATURE REVIEW

Characteristics of Teenage Mothering

Research on teenage mothers has questioned the competence of teenage mothers to parent children effectively as sensitive and responsive parents. Several studies have indicated that teenage versus older mothers are more likely to have problems in psychosocial adjustment (Passino, Whitman, Borkowski, Schellenbach, Maxwell, Keogh, & Rellinger, 1993; Whitman et al., 1987), limited knowledge of child development and parenting (Field, Widmayer, Adler, & DeCubas, 1990; Reis & Herz, 1987; Stevens, 1984), and need of support systems (Buchholz & Korn-Bursztyn, 1993; Nath, Borkowski, Whitman, & Schellenbach, 1991; Samuels, Stockdale, & Crase, 1994; Schilmoeller, Baranowski, & Higgins, 1991; Stevens, 1988).

Mothers' personal attributes (Belsky, 1984) such as self-esteem and self-efficacy (Barth, Schinke, & Maxwell, 1983; McLaughlin & Micklin, 1983) appear to influence their ability to provide appropriate care to the child. Teenage mothers are less likely than older mothers to possess an integrated self-concept (Schellenbach, Whitman, & Borkowski, 1992). Studies suggest that teenage mothers may experience psychosocial difficulties related to low self-esteem and poor problem-solving ability; they seem to be less socially competent and have limited problem-solving ability and thus undergo higher levels of parenting stress (Passino et al., 1993; Schellenbach et al., 1992).

There has been indication that mothers' knowledge of child development and parenting skills are related to their parenting practices because the knowledge can be a predictor of parental ability to stimulate and support the development of children (Reis & Herz, 1987; Stevens, 1984).

Some studies suggest that teenage mothers may be at risk for ineffective parenting problems, partly because they have limited, inaccurate knowledge as well as unrealistic expectations (i.e., "too much too soon" or "too little too late", cited in Whitman et al., 1987, p. 44) regarding child development (Field et al., 1990). In attempting to propose a model of adolescent parenting, Schellenbach and her colleagues (Nath et al., 1991; Schellenbach et al., 1992; Whitman et al., 1987) have emphasized that adolescent mothers need to be cognitively and emotionally prepared so that they parent adequately, which in turn helps child development.

In general, research focusing on parenting practices of teenage mothers has suggested that teenage mother-child interaction is more likely to be characterized by insensitivity and restriction (McAnarney et al., 1986). On the other hand, research focusing on comparisons of parenting behaviors between teenage and older mothers has consistently reported that compared to older mothers, teenage mothers tend to be less verbal, less responsive, and more prone to use punishment toward their young children (Culp et al., 1991; Garcia Coll et al., 1986, 1987; Levine et al., 1985; Passino et al., 1993). A recent example of such research is seen in the work of Barratt and Roach (1995), who showed that even with controls of family background variables, parenting differences were evident in adolescent (aged 15-18) and adult (aged 19-37) mothers. They found that the adolescent mothers displayed less appropriate interactions with their infants (e.g., vocalized less, smiled less, offered toys less often, etc.) than the adult mothers did.

In a review of the literature on child maltreatment by adolescent mothers, however, Buchholz and Korn-Bursztyn (1993) raised a question

about the research findings that teenage mothers are inadequate parents and their children are at risk for abuse and neglect. They suggested that research on the children of teenage mothers should focus on the conditions under which teenage mothers are more likely to maltreat their children, since there are other factors (e.g., living in poverty, single motherhood, higher fertility, etc.) rather than maternal age per se which may be associated with child abuse. They noted that many studies have made comparisons between teenage and older mothers without considering their different socio-demographic characteristics including socioeconomic status (Ketterlinus et al., 1991; Roosa, Fitzgerald, & Carlson, 1982). It seems, therefore, that the studies of teenage mothering have inconclusive findings.

There is considerable evidence that teenage mothering and mother-child interaction can be enhanced by the presence of a supportive network (i.e., family and social support) which may buffer or offset the problems associated with teenage mothering (Buchholz & Korn-Bursztyn, 1993; Nath et al., 1991; Schellenbach et al., 1992; Schilmoeller et al., 1991; Whitman et al., 1987). Studies have examined the link between the availability of support and parenting behaviors of teenage mothers and indicated the beneficial effects of support, both financial and emotional, to their parenting in general. For example, Unger and his associates have found that teenage mothers' perceived support (e.g., child care provided by a spouse or partner) was related to more positive parenting practices (Unger & Cooley, 1992; Unger & Wandersman, 1985) and to greater responsiveness and affection toward children (Crockenberg, 1987). They report, moreover, that family support is important in determining life satisfaction and adjustment among teenage

mothers (Cooley & Unger, 1991; Unger & Wandersman, 1985, 1988). Other investigators have also indicated the relationship between social support and psychological well-being of teenage mothers (Barth et al., 1983; Samuels et al., 1994; Schilmoeller et al., 1991).

Research on teenage mothers and their parenting, in fact, suggests that social support (for information and help with childrearing, for example) available to teenage and older mothers may be different in terms of its sources and types, with teenage mothers relying on their mothers and relatives, while older mothers turning to friends in general (Buchholz & Korn-Bursztyn, 1993; Nath et al., 1991; Schellenbach et al., 1992). Such effects of social support appear to be associated with parenting outcomes of teenage mothers that may in turn affect subsequent child development. According to Crockenberg (1987), teenage mothers who have little support from a partner are more likely to show angry and punitive parenting with their 2-year-old children who are angry and noncompliant. The support systems that teenage mothers have, thus, seem to influence their parenting behaviors (cf: Belsky, 1984).

Consequences of Teenage Motherhood

Teenage motherhood has been viewed to have adverse effects on the life chances of teenage mothers and their children since it causes problems including social, psychological, and economic difficulties for both of them (Brooks-Gunn & Chase-Lansdale, 1995; Brooks-Gunn & Furstenberg, 1986; Furstenberg et al., 1989). Researchers have suggested that the timing of childbearing explains the educational, economic, social, psychological, and

marital status of mothers. That is, teenage mothers are likely to be at socially and economically disadvantaged situations (Furstenberg et al., 1981, 1987; Hayes, 1987; Moore, Simms, & Betsey, 1986) as well as to experience stress because of a mismatch in the timing of child birth to their developmental period of adolescence (McLaughlin & Micklin, 1983; Schellenbach et al., 1992).

As a matter of fact, teenage mothers are less likely to complete high school and to attend college. In part due to their low educational attainment, it is also less likely for them to have stable and well-paying jobs. These problems of limited employment opportunities and poor earnings tend to have teenage mothers live in poverty and rely on social support systems (e.g., welfare) than the mothers who avoid early parenthood. Furthermore, the consequences of teenage motherhood often include unstable marital status, high probability of mother-headed household or singlehood, and the likelihood of having a lager family (i.e., larger number of children, living together with their own parents or relatives for child care) (Furstenberg et al., 1987; Hayes, 1987). In a word, it looks that the life chances of teenage mothers are "truncated" (Brooks-Gunn & Furstenberg, 1986, p. 225), compared to those of adult mothers, and these disadvantaged circumstances appear to influence their children's development.

Investigating the impact of early (and largely out-of-wedlock) childbearing on the life courses of teenage mothers and their children, Furstenberg, Brooks-Gunn, and Morgan (1987) have suggested a theory of teenage motherhood in their book of *adolescent mothers in later life* which takes a life-course developmental perspective that gives insight into

differences in outcomes among teenage mothers and their children (Brooks-Gunn & Furstenberg, 1987). They have attempted to not only explore how early parenthood significantly affects the life courses of teenage mothers and children, but also to explain why some of the mothers and the children do better than the others, and what individual and familial characteristics are likely to offset the potentially negative consequences of teenage motherhood.

Furstenberg and his colleagues have conducted the most extensive longitudinal investigation on teenage motherhood, a Baltimore Study which included a 17-year follow-up of a sample (primarily low-income, urban black) of about 300 teenage mothers and their first-born children. Their model includes influences from the mothers' status at the child's birth to their later status - when they are in the early 20s (while the child is in preschool years) and in the middle 30s (while the child is in adolescence). Significant factors involve educational, economic (e.g., employment, income, and welfare), and marital status as well as family size (e.g., fertility).

Overall, teenage mothers do not do as well as adult mothers, and they have remained at disadvantaged situations. However, it is also notable that there has been a certain amount of variation in the life courses of teenage mothers. Indeed, the situations of the teenage mothers in the Baltimore Study have improved significantly over time. It was found that only one fourth of the mothers were on welfare when they reached their mid 30s, that more than two thirds were currently employed, and that about one fourth have moved from poverty into the middle class. According to Furstenberg et al. (1987), there are two key factors that are strongly related to positive outcomes for teenage mothers: economic independence and low fertility. In

particular, among significant predictors that determine teenage mothers' later well-being are completion of high school, restriction of additional births, and/or a stable marriage.

As the life courses of teenage mothers are adversely affected by teenage motherhood, the lives and development of their children are influenced by the disadvantaged circumstances of teenage motherhood (Brooks-Gunn & Furstenberg, 1987; Furstenberg et al., 1987, 1989). In fact, "the costs to the children may be considerably more" (Brooks-Gunn & Furstenberg, 1987, p. 180). Research has suggested that negative developmental outcomes of the children of teenage mothers increasingly appear in cognitive functioning and psychosocial problems throughout the childhood (Brooks-Gunn & Furstenberg, 1986), and such developmental problems are linked to later school and social behavior difficulties. For example, school achievement among adolescent children born to teenage mothers is substantially low (e.g., repeating a grade) and school behavioral problems (e.g., misbehaviors, juvenile conduct disorders) are considerably high (Brooks-Gunn & Chase-Lansdale, 1995; Brooks-Gunn & Furstenberg, 1987). Furstenberg et al. (1987) maintained that such conditions of teenage mothers as welfare dependency, low educational attainment, singlehood or unstable marriage, and large family size are significantly associated with poor developmental status of their children.

In short, research has documented negative consequences of teenage motherhood on both the mothers and the children. It suggests that several factors operate for their outcomes, including the adverse social and economic effects associated with teenage motherhood, and/or less adequate or less

experienced mothering by teenage mothers. However, "precise causal links between early childbearing and the well-being of children have not been well delineated especially if parenting goes well" (Brooks-Gunn & Chase-Lansdale, 1995, p. 128).

Home Environments as a Parenting Quality

Over the last quarter century, Bradley and his colleagues have been concerned about how home environments contribute to the optimal development of children and attempted to develop a theory of environment/development relationships (Bradley & Caldwell, 1984a; Bradley et al., 1989). They have maintained that the quality of a child's home environment strongly influences the child's development and behavior, developing the HOME (Home Observation for Measurement of the Environment) Inventory as an environmental process measure to help explain the relation between environment and development (Bradley, 1982, 1985; Caldwell & Bradley, 1984). Their theory and related research have primarily focused on the quality of developmental environment (i.e., cognitive stimulation and socio-emotional support) that parents provide for the child in the home, which makes possible to "specify the mechanisms through which the environment facilitates human development" (Caldwell & Bradley, 1984, p. 2).

For explaining environment/development relations, Bradley (1995) has defined the parenting environment as "the phenomena emanating from the family setting" (p. 236), including all the physical and social phenomena within a particular place of residence such as the child's home. Parents are

considered as being active and goal-directed in the home environment; they construct, arrange, and use objects, activities, and/or events within the environment for the purpose of achieving the child's optimal development as their parenting goals. These home experiences are related to various aspects of the child's development and behavior, such as cognitive competence (Bradley et al., 1989), school achievement (Bradley & Caldwell, 1984b; Bradley et al., 1988), classroom behavior (Bradley et al., 1988), language performance (Bradley & Caldwell, 1984a), and intelligence (Bradley, 1982, 1985).

In general, a particular behavioral and/or developmental outcome in children may depend on how parents parent their children, in other words, how parents construct and use the home environment for their children. It has been suggested that parents should provide various types of inputs that are fitted to a child's own states and needs to facilitate the child's development (Bradley, 1995; Caldwell & Bradley, 1984). Bradley and his colleagues have indicated that there are four kinds of regulatory functions (or processes) for the parenting environment to do in order to promote the optimal development of children: It must help 1) *sustain* a child, 2) *stimulate* the child's activity for enhancement, 3) *support* the child's capabilities and tendencies, and 4) *control (i.e., monitor and structure)* the experiences (inputs) of the child so that there is a good fit between what the child needs and what the parenting environment provides (Bradley, 1995; Bradley, Caldwell, & Rock, 1990).

The studies that address the effect of home environments as a parenting quality have generally suggested that the parenting environment

should provide adequate and sufficient levels of physical safety, cognitive stimulation, and supportive responses to children (Parcel & Menaghan, 1993; Rogers et al., 1991). In fact, several studies support the importance of sufficient and varied stimulating experiences for the child's optimal development of cognitive functioning (Bradley & Caldwell, 1984b; Bradley et al., 1988, 1989; Luster & Dubow, 1992). The optimal socio-emotional development of the child also depends on the parenting environment that appropriately and timely responds to the child's needs and capacities (Garrett et al., 1994; McLeod & Shanahan, 1993; Parcel & Menaghan, 1993; Rogers et al., 1991). In addition, it needs to control the experiences of the child to encourage exploratory activities and to further positive developmental outcomes.

Relating the quality of home environments to children's competence with respect to academic achievement and classroom behavior, Bradley et al. (1988) examined three models of environmental action: primacy of early experience; predominance of the contemporary environment; cumulative effects in stable environments. According to these models, parents who are consistently responsive and sensitive in providing their children with developmentally stimulating and enriching experiences are more likely to have children who show better on academic achievement and behavioral adjustment. Such challenging and supportive environments encourage children to explore opportunities and thus enhance the children's development in the areas of academic and social competence. They evidence that there are significant relationships between the home environment (early and contemporary) and children's school performance during middle

childhood (Bradley et al., 1988) as well as cognitive development during early childhood (Bradley et al., 1989).

Furthermore, research on the relation between home environment and child development has consistently reported that parental emotional support (i.e., parental responsitivity, nurturance, and acceptance) and cognitive stimulation (i.e., availability of stimulating materials, parental involvement, and encouragement) are strongly related to the child's developmental status. It appears, for example, that cognitive stimulation has a stronger relation to the child's academic achievement than emotional support does (Bradley & Caldwell, 1984b).

In summary, home environment as a parenting quality is an important source of both cognitive stimulation and emotional support, which seems to have considerable influences both on children's cognitive performance and academic achievement and on their social competence and behavioral adjustment. It is likely, therefore, that parents who provide stimulating and supportive home environments promote children's positive developmental outcomes.

Links between Teenage Parenting and Child Outcomes

As mentioned above, the development of children born to teenage mothers appears to be negatively affected by teenage motherhood and parenting (Brooks-Gunn & Furstenberg, 1986; Furstenberg et al., 1987; Hofferth, 1987). It seems that being born to teenage mothers is a risk factor for children (Hayes, 1987). However, the children's developmental risks (e.g., cognitive functioning, social behavioral problems) possibly associated with

teenage motherhood have not been extensively examined until recently. In addition, little is known about individual differences among these children, especially as a function of the child's characteristics (e.g., age, gender) and the mother's parenting practices (cf: Dubow & Luster, 1990).

Mothers who were teenagers at the time of their child's birth are found to be less competent at parenting in general. It is unlikely that teenage mothers provide cognitively rich and stimulating experiences and emotionally supportive responses to their children as do older mothers (Buchholz & Korn-Bursztyn, 1993; Hechtman, 1989; Luster & Mittelstaedt, 1993; Miller & Moore, 1990). These less than optimal parenting practices of teenage mothers, in turn, appear to be related to less positive developmental outcomes of their children (Kandel et al., 1994; Ketterlinus et al., 1991).

Research on the effect of teenage parenting on children can be found, first, in the studies of Garcia Coll et al. (1986) and Field et al. (1990) that used the Caldwell's Home Inventory with infants of 8-month and 12- to 24-month old, respectively. Overall, both studies found that teenage mothers, Caucasian and Black (as well as Cuban) mothers, respectively, offered less stimulating and supportive home environments for their infants and that such less adequate teenage parenting affected those infants' cognitive developmental status measured by the Bayley Mental Development Indices.

Regarding the developmental outcomes of school-aged children born to teenage mothers, both Barratt's (1991) and Moore and Snyder's (1991) studies examined the cognitive attainment of firstborn children (aged 6-7 and aged 3-7, respectively) using the HOME inventory, and found that the children were less competent with respect to academic achievement and

aptitude when they had less competent mothers providing less intellectual stimulation and emotional support in the home. In another study, Dubow and Luster (1990) investigated the academic and behavioral adjustment of 8- to 15-year-old children born to teenage mothers and reported that these children who had poor quality of home environments showed lower achievement and higher behavior problems.

Although research on the consequences of teenage parenting for children's development has generally indicated these children's increased risk for developing problems in the cognitive (Barratt, 1991; Dubow & Luster, 1990; Ketterlinus et al., 1991; Moore & Snyder, 1991) and behavioral (Dubow & Luster, 1990; Kandel et al., 1994) domains, it is important to notice that there is some variability within samples of teenage mothers and their children. While many children born to teenage mothers have been reported to have less favorable scores in measures of cognitive competence and social emotional adjustment, some of the children appear to show less problematic outcomes.

Dubow and Luster (1990), for example, investigated the contribution of parenting practices of teenage mothers as one of protective factors in adjustment problems of children, suggesting the possibility that not all children born to teenage mothers are at the same risk for having developmental problems. Besides, examining the relation between parenting beliefs and behaviors in a sample of teenage mothers with toddlers, Luster and Rhodes (1989) found that there were substantial differences among teenage mothers in how they provided cognitively and emotionally supportive care for their young children. Roosa and Vaughan's (1984) study with

preschool children of teenage mothers also suggested significant variations in teenage parenting, emphasizing the role of competent teenage mothers for producing positive developmental outcomes of children. In short, more stimulating and supportive parenting can be positively associated with better intellectual achievement and fewer behavioral problems within a sample of children born to teenage mothers.

There have been some inconsistencies, however, in research findings with regard to the effects of mothers' age at birth on their parenting and children's development. Some studies have revealed no effects of young maternal age at birth after the effects of socio-demographic status were accounted for. In recent research on African-American teenage mothers in poverty, for example, Chase-Lansdale, Brooks-Gunn, and Zamsky (1994) found that there was no main effect of mothers' age at first birth after controlling for their poverty status on the quality of teenage parenting (Elster et al., 1983; McAnarney, 1985).

By the same token, Ketterlinus et al. (1991) argued in their study of the effects of maternal age at birth on children's cognitive development that the conclusion of development of children born to teenage mothers being deficient might be "premature because of sample biases and methodological flaws that characterize much of the research" (p. 174). They found that maternal age at birth had no significant effects on the academic achievement of elementary school children after controlling for maternal intelligence, socioeconomic status, and the quality of home environments, suggesting a reexamination of the effects of teenage motherhood and parenting on children's development. Similar results can be found in the studies of Desai,

Chase-Lansdale, and Michael (1989) with 4-year-old children's intellectual ability measured by the PPVT-R and of Kinard and Reinherz (1987) who reported no significant differences between fourth graders of teenage mothers and those of older mothers with respect to their school aptitude and performance.

In summary, teenage parenting has been found to contribute to infant behaviors and development and proposed to be an important predictor of later developmental outcomes of children as well. However, there is limited yet burgeoning research on the impact of teenage parenting practices on school-aged children, reflecting a further need for such investigation (Chase-Lansdale et al., 1991; Furstenberg et al., 1989). Although several studies have been recently conducted on children born to teenage mothers, few studies have shown a clear pattern of the effects of teenage parenting on child outcomes and explained the processes underlying individual differences that might occur among the children. Focusing on teenage mothers' parenting practices, this study attempts to clarify the processes through which the development of children born to teenage mothers are influenced and determined.

Background Variables as a Contextual Factor

Socio-Demographic Characteristics:

Child Age and Gender

Child characteristics, such as age and gender, may affect parenting and developmental outcomes. There is indication that parents do not exhibit the same parenting behaviors for their children throughout childhood;

parental responsiveness, for example, tends to change the way in which it is expressed as children grow older (Bradley, 1995). In a study of teenage mothers' parenting, Nitz, Ketterlinus, and Brandt (1995) also found that child age was a significant predictor of the mothers' parenting behaviors. In addition, the effects of teenage motherhood on children's development appear to be more evident as the children of teenage mothers develop (Brooks-Gunn & Furstenberg, 1986, 1987; Furstenberg et al., 1987).

Child gender may also be related with home environments (Menaghan & Parcel, 1995), although Bradley and his colleagues have generally found no significant differences of gender on the full HOME measure (Bradley et al., 1988; Bradley & Caldwell, 1984c). Regarding qualities of teenage mothers' parenting, in particular, East, Matthews, and Felice (1994) suggest no effects of child gender on parenting. However, there seems to be gender differences in the academic achievement of children; females generally have higher scores on the reading measure (Ketterlinus et al., 1991). It is also likely that greater behavioral problems are reported among boys than girls (Leadbeater & Bishop, 1994), with greater aggressiveness being exhibited by boys (Rogers et al., 1991).

Race

Teenage mothers' parenting and its effects seem to differ across racial/ethnic groups. Some studies have found that race is a significant predictor of teenage parenting (Barratt & Roach, 1995; Moore & Snyder, 1991). According to East et al. (1994), white teenage mothers have more favorable parenting attitudes than do African-American and Hispanic

teenage mothers. Similarly, Reis and Herz (1987) reported that white teenage mothers showed higher scores on the HOME measure than non-white teenage mothers. There is indication that racial/ethnic background may influence maternal values regarding parenting and/or mother-child interaction and thus be associated with children's home environments (Elardo & Bradley, 1981; Menaghan & Parcel, 1991, 1995).

Race/ethnicity has been also identified as a risk factor for maladjustment during childhood. Patterson, Kupersmidt, and Vaden (1990) found that ethnicity was an important predictor of academic achievement of elementary school children. Besides, it seem to be related to the level of reported behavioral problems of children (Rogers et al., 1991). Studying preschool children of African-American and Puerto Rican teenage mothers, for example, Leadbeater and Bishop (1994) found that African-American mothers were more likely to report behavioral problems of their children.

Residence

There is evidence that urban residence is a risk factor for developmental problems of children born to teenage mothers; for example, urban residence is likely to be related to low academic achievement of those children (Dubow & Luster, 1990). In general, reading and behavioral problems of children appear to be more serious in the urban area, largely because families in the urban area tend to experience more various stressors (e.g., marital discord, crowded living conditions) than do families in the rural area. Also, it is more likely that many urban schools provide less than optimal educational settings for children (Rutter, 1981).

Family Structure (Number of Children and Father Presence)

Family structure, particularly family size and father presence, influences the quality of home environment provided for children born to teenage mothers (Barratt, 1991; Dubow & Luster, 1990; Kandel et al., 1994; Luster & Dubow, 1990). Several studies have found that the large number of children in the household has negative effects not only on the quality of home environment and parenting practices (Barratt, 1991; Bradley & Caldwell, 1984c; Hannan & Luster, 1991; Luster & Dubow, 1990; Menaghan & Parcel, 1991, 1995; Parcel & Menaghan, 1993; Rogers et al., 1991) but also on the child's cognitive development (Barratt, 1991; Dubow & Luster, 1990) and behavioral problems (Dubow & Luster, 1990; Parcel & Menaghan, 1993; Rogers et al., 1991). It seems that mothers provide less sensitive care and less active involvement with their children if they have many children and that such less optimal parenting contributes to less positive outcomes of children. Besides, it is likely that crowded conditions in the home limit children's exploratory activities and lead to children's lower achievement and higher aggressiveness (Bradley, 1995).

In general, research on teenage mothers points to the importance of family support for the mothers and their children (Nath et al., 1991; Schilmoeller et al., 1991). The support from a father and/or grandmother is related to both the quality of home environment and the developmental outcomes of children born to teenage mothers (Cooley & Unger, 1991; Unger & Cooley, 1992). Crockenberg (1987) found that teenage mothers with good partner support were less rejecting and punitive in their parenting practices.

Indeed, the presence of additional nurturing adults (e.g., father/father figure) in the household is not only positively associated with the quality of home environment (Menaghan & Parcel, 1991, 1995) and the child's intellectual achievement (Barratt, 1991) but also negatively associated with behavioral problems of children (Parcel & Menaghan, 1993; Rogers et al., 1991).

Family Income

It has been well documented that family income and/or poverty status significantly influence parenting practices measured by the HOME (Barratt, 1991; Luster & Dubow, 1990) and child development (Barratt, 1991; Dubow & Luster, 1990; Furstenberg et al., 1987) in the literature on teenage mothers and their children. Several studies have shown significant links between family income and the quality of home environment (Bradley & Caldwell, 1984c; Garrett et al., 1994; McLeod & Shanahan, 1993; McLoyd, 1990; Menaghan & Parcel, 1995); poor income and poverty are associated with lower quality of home environment in general.

Furthermore, living in poverty is negatively related to children's academic and behavioral outcomes (Dubow & Luster, 1990; McLeod & Shanahan, 1993). It seems that poor children experience greater psychological distress (McLoyd, 1990). Examining the impact of economic hardship on Black children, McLoyd (1990) argued that current poverty status of Black families can explain the mothers' less positive parenting practices such as less emotional responsiveness and frequent use of physical punishment, which, in turn, influences their children's socioemotional development.

Maternal Characteristics:

Age at First Birth

There is considerable evidence that mother's age is positively related to both parenting practices (East et al., 1994; Luster & Rhodes, 1989; Menaghan & Parcel, 1991; Ragozin et al., 1982; Reis & Herz, 1987) and child outcomes. Research has shown that the cognitive and behavioral development of children born to teenage mothers is influenced by the mothers' age at birth (Barratt, 1991; Dubow & Luster, 1990; Moore & Snyder, 1991). Maternal age at birth has been also found to be positively associated with emotionally supportive responses to preschool (Conger et al., 1984) and school-aged children (Barratt, 1991; Dubow & Luster, 1990; Luster & Dubow, 1990). Examining determinants of children's home environments, Menaghan and Parcel (1991) suggested the evidence that older age of mothers contributes to more positive home environments because of their greater maturity and experience.

However, some investigators have argued that the impact of mother's age is often difficult to separate from confounding variables such as maternal education/intelligence, marital status, race, poverty, and/or socioeconomic status (Brooks-Gunn & Furstenberg, 1986; Moore & Snyder, 1991); the effects of maternal age are lessened when such background variables are considered. Studies report, for example, that maternal age effects on parenting and child development are mediated by other variables including maternal education (Garcia Coll et al., 1987; Kinard & Reinherz, 1987), family structure (Card, 1981; Kinard & Reinherz, 1987), and

socioeconomic status (Garcia Coll et al., 1987; Philliber & Graham, 1981; Wadsworth, Taylor, Osborn, & Butler, 1984). Contrary to the hypothesis of negative effects of young maternal age, Darabi, Graham, Namerow, Philliber, and Varga (1984) found few significant effects of maternal age on the well-being of firstborn children and the mother-child interaction.

Education

Limited educational attainment of teenage mothers (Furstenberg et al., 1987) is associated with their less adequate parenting ability (Schellenbach et al., 1992). Studies have found that mothers' level of education and/or intelligence influences their parenting quality measured by the HOME (Bradley & Caldwell, 1984a; Menaghan & Parcel, 1991, 1995). It seems that higher educational attainment of mothers is a positive predictor of home environments; they are likely to provide more stimulating home environments.

In addition, several studies have reported that mother's education has a great impact on the academic ability and performance of children (Barratt, 1991; Kinard & Reinherz, 1987). Dubow and Luster (1990) argued that low maternal education (less than 12 years) is a risk factor for developmental problems (especially, academic achievement) of children born to teenage mothers. By contrast, mothers with higher levels of education may well manage their children's behavior problems (Parcel & Menaghan, 1993; Rogers et al., 1991).

Self-Esteem

Maternal self-esteem has been associated with positive parenting practices that contribute to the child's optimal development. Mothers with higher self-esteem have better adjustment to parenting (Samuels et al., 1994) and are more responsive to their children (Kandel et al., 1994; Luster & Dubow, 1990; Unger & Wandersman, 1985), which is, in turn, likely to result in positive development of children. In fact, Parcel and Menaghan (1993) argue that mothers' psychological resources may influence their children's social behaviors (Kandel et al., 1994), "probably through such mechanisms as parenting styles" (p. 124) (cf: Belsky, 1984). In other words, mothers with more positive self-concepts are expected to be more effective in parenting their children (Menaghan & Parcel, 1991).

In a study of factors related to the adjustment of children born to teenage mothers, Dubow & Luster (1990) found that low maternal self-esteem was related to low academic achievement and maladjustment problems in preadolescent children. There is also evidence that teenage mothers' self-esteem significantly predicts their preschool children's developmental outcomes such as social competence (Hubbs-Tait et al., 1994).

CHAPTER III: METHOD

Participants

Participants of this study were drawn from the data of the "Children of the National Longitudinal Survey of Youth (NLSY)". The project of the NLSY, primarily funded by the Bureau of Labor Statistics of the U.S. Department of Labor, was developed to get broad information on the labor force experience of young men and women and to help evaluate employment and training programs/policies for youth in the late 1970s. When first surveyed in 1979, the NLSY included a nationally representative sample of 12,686 (11,406 civilian and 1,280 military) youth (6,403 males, 6,283 females) who were 14 to 21 years of age as of January 1, 1979, with oversamples of blacks, Hispanics, and economically disadvantaged whites.

The NLSY civilian sample selection was made through a multi-stage stratified area probability sampling of approximately 75,000 dwellings and group quarters among 1,818 sample segments in 202 Primary Sampling Units (PSUs) which included most of the fifty states and the District of Columbia. And, the military sample was selected from rosters provided by the Department of Defense, with probabilities proportional to the number of persons born in 1957 through 1961 and serving in the military. In summary, the probability sample of the NLSY was designed to represent the entire population of youth (civilian and military) residing in the United States on January 1, 1979 and born between January 1, 1957 and December 31, 1964 (Center for Human Resource Research, 1993b).

The original respondents, to date, have been yearly interviewed since 1979. After the 1984 surveys, however, 1,079 (out of 1,280) military respondents were dropped from the NLSY sample. Thus, of the total 11,607 respondents, 10,436 respondents (5,112 males, 5,324 females) were interviewed in 1990, resulting in a retention rate of 89.9%. The NLSY surveys have asked the respondents questions on such topics as household composition, education and intelligence, jobs and training, work and marital history, income, health and well-being, attitudes, fertility, and child care, as well as demographic and family background characteristics (Center for Human Resource Research, 1993a).

Beginning in 1986, with the funding from the NICHD (National Institute of Child Health and Human Development), the NLSY was expanded to collect the data on children born to the NLSY female respondents. Accordingly, a comprehensive battery of child assessments has been administered (biennially) since 1986 to NLSY mothers and their children in order to gather detailed information on not only the quality of home environments but also on the socio-emotional and cognitive development of children. In the 1990 survey, the battery of child assessments was completed for 5,803 children. It regards that the sample of NLSY children assessed in 1990 is representative of American children who have been born to a national sample of women born in 1957 through 1964 and living in the United States in 1979 (Baker, Keck, Mott, & Quinlan, 1993).

The sample of this study was selected as follows: The original NLSY females of 6,283 in 1979 included 441 (out of 456) military females who were no longer interviewed after the 1984 survey and 901 females of economically

disadvantaged whites whose children were not assessed in 1990. At the time of the 1990 survey, therefore, a sample of 4,941 women (who were 25 to 33 years of age) was eligible to be interviewed, and 4,510 (about 91%) of these women were interviewed. Of the interviewed women, 3,088 (about 68%) were known to have children; among them, 2,772 (about 88%) provided some assessment information about their children.

As a sample of children for the 1990 Child survey, 6,427 children have been identified as born to the women interviewed in 1990. Of these children, 5,949 (about 93%) were living in their mother's household and eligible to be assessed. Finally, 5,803 children (about 90%) were interviewed for information on home environments and child developmental outcomes (see Table 1).

Table 1. NLSY Mother and Child Samples in 1990 Survey

	1979	1990
NLSY Females		
Eligible for Interview	6283	4941
Interviewed	6283	4510
NLSY Mothers		
Eligible for Interview	-------	3088
Interviewed	-------	2772
NLSY Children		
Born to Interviewed Mothers	-------	6427
Eligible for Interview	-------	5949
Interviewed	-------	5803
Assessed with a valid HOME score*	-------	5359

*The HOME is the only assessment for which all age group of children are eligible.

Since the present study purported to examine the quality of home environments and the developmental outcomes of firstborns of teenage mothers, firstborn children and the mothers who gave first birth as teenagers (below age 20) were selected for the study. Consequently, 1,015 children (firstborn) and mothers (teenagers at the time of first birth) were first chosen as the sample. The age ranges of firstborn children (who are in ages 5 to 19 at 1990 interview date) and of teenage mothers (between the ages of 11 and 19) when they gave first birth are presented in Table 2.

Table 2. Age of Child by Age of Mother at 1st Birth: 1990 Interview

Age of Child in 1990	Age of Mother at First Birth *								
	11	13	14	15	16	17	18	19	Total
5								1	1
6							2	25	27
7						2	23	44	69
8						17	26	54	97
9					9	23	31	50	113
10				6	24	36	49	35	150
11			1	7	21	23	31	31	114
12			5	10	23	30	25	20	113
13			3	9	17	25	26	27	107
14			1	12	34	25	25	8	105
15		2	2	13	21	29	8		75
16				7	11	6			24
17			3	6	5				14
18	1		2	2					5
19		1							1
Total	1	3	17	72	165	216	246	295	1015

* Mothers are now in ages 25 to 33 in 1990.

From the 1,015 sample with children aged 5-19, four participants (one 5-year-old, one 19-year-old, and two who indicated zero for the number of children in the household) were dropped from the initial sample. At last, 1,011 children (who are 6 to 18 years of age in 1990) and their mothers were selected for the final sample in this study.

The NLSY Child surveys have been cooperative efforts of the CHRR (Center for Human Resource Research) and NORC (National Opinion Research Center). Whereas the CHRR has taken overall responsibility for the development of survey instruments, NORC has had the primary charge of fielding procedures and data collection. Each draft of the child instruments was reviewed and advised by authors of the original measures. Specifically, for developing the child assessments, two experienced NLSY interviewers carried out a preliminary pretest of the draft child assessments with a mother and several children. Then, NORC conducted a pretest of the child assessments using a sample of approximately 200 NLSY respondents. After the CHRR and NORC reviewed the results of the pretest, they modified questions, interviewing methods, and administrative procedures. Finally, the child assessments were made up into two booklets ("Mother Supplement", "Child Supplement") and used for the NLSY Child surveys (Baker et al., 1993).

Each interview of the NLSY respondents, on an average, took one hour, and the administration of the child assessments took additional 30 minutes. Each NLSY respondent was paid ten dollars, and NLSY mothers

participating in the child assessments were paid additional five dollars per child as an incentive to complete the interview (Center for Human Resource Research, 1993b). The interviews for the 1990 NLSY Child data were conducted during June through December, 1990. The data on the NLSY children biennially (1986-1990) collected from the Child Assessments and the data on the NLSY females annually (1979-1991) collected during the Youth surveys have been combined into a separate dataset, called the "NLSY Child Data". This study used the most recent release of the '1990 NLSY Child Data' in the form of CD-ROM and utilized the 1990 Child Assessment data.

Measures

Two special Child Assessments have been used for the NLSY Child data. The Mother Supplement is used to get information from NLSY mothers about child socio-emotional attributes, behavioral characteristics, and home environments, and the Child Supplement is used to assess the cognitive developmental level of NLSY children. The instruments included in those assessments were carefully selected in terms of their popularity ("tried and true tests"), reliability and validity, simplicity of administration, safety to respondents, and appropriateness from both longitudinal and cross-sectional perspectives (Baker et al, 1993). In this study, three instruments selected among the nine instruments that were utilized in the 1990 Child survey, as well as two measures (categories) of background characteristics, were used for analysis:

(1) The Home Observation for Measurement of the Environment - Short Form (HOME-SF). The HOME-SF, a half-shortening modified version of the HOME Inventory (Caldwell & Bradley, 1984), was developed to measure the quality of a child's home environment, particularly the quality of cognitive stimulation and emotional support provided in a child's home. Most of the HOME-SF's items are based on multiple-choice responses of mothers that are later recorded into dichotomous zero-one scores and then summed to produce a total score (alpha = .73 for the sample of children age 6 to 9; alpha = .68 for the sample of children age 10 and older). Studies using the HOME-SF have demonstrated that the scale is not only reliable but has construct and predictive validity (see Baker et al., 1993, pp. 88-93 for detailed information on the quality of the HOME data).

In scoring the HOME-SF, both the maternal reports (18 items) of the HOME in the Mother Supplement and interviewer observations (9 items) in the Child Supplement were used. The raw scores of the HOME-SF, therefore, ranged from 0 to 27. The NLSY children have been normed on a single year of age basis with each (weighted) year of age group being assigned a standard score mean of 100 and standard deviation of 15 (Baker et al., 1993). This study used the total HOME-SF standard score for analysis.

Items assessing the cognitive stimulation of home environment for children age six and older, for example, included questions about the number of books, frequency of reading, using a musical instrument, a daily newspaper, doing hobbies, extra activities, museum visit, attending theatrical performance, and discussing TV programs, as well as observations of physical environment in respect of perceptual monotony, visible cleanness,

clutter, and hazardous structure. On the other hand, items assessing the emotional support of home environment asked about expectations of doing chores, getting together with relatives or friends, spending time with a father or father figure (e.g., in outdoor activities), eating a meal with parents, disciplinary techniques in misbehavior situations, and frequency of spanking, as well as observed the mother's encouragement, verbal response, and acceptance of the child (see Appendix A).

(2) The Peabody Individual Achievement Test (PIAT) : Math, Reading Recognition, and Reading Comprehension. Three subtests of the PIAT were administered to children with a PPVT age of five years and over in order to measure their mathematical ability (i.e., recognizing numerals and using advanced math concepts), reading ability (i.e., recognizing letters and reading words) and ability to derive meanings from sentences they read.

The assessments of PIAT Math, Reading Recognition, and Reading Comprehension consisted of 84, 84, and 64 items, respectively, each having four options, that increase in difficulty from kindergarten to high school levels. These PIAT assessments have been widely used in research on academic achievement and generally considered highly reliable and valid. Overall, the one-month test-retest reliabilities for the PIAT Math, Reading Recognition, and Reading Comprehension are .74, .89, and .64, respectively (Baker et al., 1993). In this study, the total standard scores (with a mean of 100 and a standard deviation of 15) of PIAT Math, Reading Recognition, and Reading Comprehension were combined to measure the academic

achievement of children; the combined total PIAT standard score was used for analysis.

(3) Behavior Problems Index (BPI). The BPI includes a set of 28 questions that was developed from an adaptation of the Child Behavior Checklist (Achenbach & Edelbrock, 1981), measuring childhood specific behavior problems exhibited by the child age four and older. The scale primarily assesses six subdimensions of child behavioral adjustment such as antisocial, anxious-depressed, headstrong, hyperactive, dependent, and peer conflict/ withdrawn behaviors. This study, however, excluded the dependent subdimension (4 items) which is applicable only to children ages 4 to 11; therefore, the five subdimensions were combined to create the total BPI consisting of 24 items.

Mothers were asked to rate their child's problem behaviors using three response categories ("often true", "sometimes true", and "not true") of each item. The responses are later dichotomized with "often true" or "sometimes true" being given a score of one and "not true" a score of zero, and then summed to construct the BPI total score (alpha = .88) for each child. The raw scores of the BPI ranged from 0 to 24. Higher scores reflect more behavior problems (see Appendix B). Since standard scores on an age-specific basis (with a national mean of 100 and standard deviation of 15) are available for the scale, this study used the total BPI standard score combining the standard scores of five subdimensions for analysis.

As an important indicator of the child's socioemotional development, the BPI has been used in research exploring such issues as the effects of

maternal employment (Belsky & Eggebeen, 1991), daycare (Baydar & Brooks-Gunn, 1991), divorce, and family poverty (McLeod & Shanahan, 1993). Studies employing the scale have demonstrated its high internal consistency reliability and construct validity. For instance, the studies of Parcel and Menaghan (1993) and of Rogers et al. (1991) have shown the strong relationship between the BPI and various social and family variables. (For details on the quality of the BPI data, refer to Baker et al., 1993, pp. 106-111).

(4) Socio-Demographic Characteristics. As child and family characteristics, included were seven questions related to child age, gender, race, residence, number of children, father presence, and family income. These questions were among the variables interviewed in 1990.

Child Age. The variable asking the age of child at 1990 interview was answered in months. This variable was recoded in years, yielding a range of 6 to 18 years of age for the sample.

Gender. Sex of child was dummy coded as male (0) or female (1).

Race. Race of child had three categories: Hispanic (1), Black (2), and Non-Black, Non-Hispanic (3), which was from the mother's racial/ethnic cohort at the initial 1979 interview.

Residence. Respondents were asked if their current residence is rural (0) or urban (1).

Number of Children. Respondents were asked to indicate the number of children in the household of mother. The number of children for the sample was in the range of 1 to 7.

Father Presence. Respondents were asked if spouse of mother is present in the household of mother, which was answered with yes (1) or no (0).

Family Income. Total net family income in the previous year (1989) was asked in actual dollars. This variable was recoded into the following categories: 0 (0), 1 to 9999 (1), 10000 to 19999 (2), 20000 to 29999 (3), 30000 to 39999 (4), 40000 to 49999 (5), and 50000 and greater (6).

(5) Maternal Characteristics. For information on maternal characteristics, such questions as age at first birth, educational level, and self-esteem were examined. The questions of mother's age at first birth and education were asked at the time of 1990 interview, and the questions measuring maternal self-esteem were assessed in the 1987 NLSY survey.

Age at First Birth. Age of mother at birth of first child was asked, and its range was in ages from 11 to 32. Accordingly, the selected sample of teenage mothers showed the age range of 11 to 19 at first birth.

Educational Level. Mothers were asked to indicate their highest grade completed as of 1990 interview. The educational level ranged from none (0) to 8th year college or more (20), in addition to ungraded (95) which was recoded as missing values. This variable was examined using the following recoded categories: no more than 8th grade (1), 9th to 11th grade (2), 12th grade (3), and more than 12th grade (4).

Self-Esteem. The Rosenberg's Self-Esteem scale was administered to measure the respondent's self evaluation. It contained 10 statements of self approval and disapproval as follows: a)"I am a person of worth", b)"I have a

number of good qualities", c)"I am inclined to feel that I am a failure", d)"I am as capable as others", e)"I feel I do not have much to be proud of", f) "I have a positive attitude", g)"I am satisfied with myself", h)"I wish I had more self-respect", i)"I feel useless at times", and j)"I sometimes think I am no good at all". Responses ranged from strongly agree (1) to strongly disagree (4). Five (a, b, d, f, g) items were recoded in order for a higher score to imply higher self-esteem. Cronbach's alpha on this scale for the sample was .85.

Data Analysis

The data were analyzed using Version 6.0 of SPSS for Windows (Norusis, 1993). In addition to descriptive statistics used for frequency distributions and percentages of the data, simultaneous multiple regression analyses were conducted to test the hypotheses proposed in the present study (see Figure 1). As seen in the study framework, this study had three phases to be examined. The first phase was to examine the relationship between the child, family, and maternal characteristics (as independent variables) and the quality of home environments (as a dependent variable). The second phase of the study was to examine the relationship between the quality of home environments (as an independent variable) and the child's cognitive and behavioral developmental outcomes (as dependent variables). Finally, the third phase was to examine the relationship between the child, family, and maternal characteristics and the child's cognitive and behavioral outcomes, and to investigate the role that the home environment (as a mediate variable) played in those relationships.

According to the study framework, therefore, the following hypotheses were established for analysis:

H 1 : The quality of home environments that teenage mothers provide for their child is related to each of the child, family, and maternal characteristics:

a) child age, b) gender, c) race, d) residence, e) number of children, f) father presence, g) family income, h) teenage mother's age at first birth, i) education, j) self-esteem.

H 2 : The quality of home environments has a positive effect on the cognitive outcomes and a negative effect on the behavioral outcomes of children born to teenage mothers.

H 3 : Each of the child, family, and maternal characteristics is related to the child's cognitive and behavioral developmental outcomes.

H 4 : The quality of home environments mediates the effects of the child, family, and maternal characteristics on the cognitive and behavioral outcomes of children.

To test the above hypotheses, a series of multiple regression analyses were employed. To be specific, as the principal goal of this study was to examine the mediational role of home environments in the developmental outcomes of children, the analyses were conducted following the procedures suggested by Baron and Kenny (1986) regarding the mediator variable in social psychological research: 1) regress the mediate variable on the independent variables; 2) regress the dependent variable on the independent variables; and 3) regress the dependent variable on both the independent

variables and the mediate variable (cf: Benson, Larson, Wilson, & Demo, 1993).

In addition, the one-way analysis of variance procedures were performed to see group differences of race in the quality of home environments and the cognitive and behavioral outcomes; if there were significant differences among the racial groups, the Tukey-B tests for comparison of group means were conducted to detect which groups are significantly different. Also, zero-order correlations were used to examine correlations among the independent variables, the mediate variable, and the dependent variables of the study. Inspection of the correlational matrix (see Table 3 in the results section) indicated that there would not be a problem of multicollinearity among the independent variables which might lead to difficulties in the estimation of regressions (Pedhazur, 1982). A confidence level of $p < .05$ was used as the criterion for acceptance of the hypotheses tested in the present study.

CHAPTER IV: RESULTS

The results of this study involved the descriptive findings of socio-demographic and maternal characteristics of the participants consisting of 1,011 teenage mothers and their children, the correlational findings among the variables examined in the study, and the multivariate findings of testing the hypotheses proposed in the present study.

Descriptive Findings

Socio-Demographic Characteristics. Selected socio-demographic (e.g., child, family) characteristics examined in this study were child age, gender, race, residence, number of children, father presence, and family income. Descriptive analyses showed that the age of 1,011 children for the study ranged from 6 to 18 years, and the mean age of the children was 11.1 years; about one third (30.3%) were in the range of age six to nine, and two thirds were age ten and older. The children included 517 males (51.1%) and 494 females (48.9%), composed of Blacks (45.4%), Hispanics (22.7%), and Non-Blacks, Non-Hispanics (31.9%).

A little more than half of the children (50.5%) lived in the absence of a father. The mean number of children in the household of teenage mothers was 2.5; slightly more than two thirds had two or three children, while 17.7% had only one child and 15.0% had four or more children. In addition, nearly three quarters of the participants lived in urban area. The family's median annual income was $18,381 (mean annual income was $23,495, SD = $18,948); 21.6% had a family income of less than $10,000, and only 7.2% had

an annual income of $50,000 or more. (For more details on the socio-demographic characteristics of the participants, refer to Appendix C).

Maternal Characteristics. As maternal characteristics for the study, teenage mothers' age at first birth, educational level, and self-esteem were investigated (See Appendix D for frequency distributions). The mean age of teenage mothers' age at first birth was 17.5 years; the largest percentage (29.1%) of teenage mothers gave their first birth at age 19, and 2.0% had a teenage birth at age below 15. The educational level of teenage mothers was on the average of 11.3 years. Whereas 41.9% of the teenage mothers were high school graduates, 41.7% had less than a 12th grade education and only 16.1% had some college level of education. As for the self-esteem of teenage mothers, they had a fairly high level of self-esteem; it ranged from 20 to 40, with a mean score of 32.2 (SD = 4.1).

Correlational Findings

The zero-order correlations, along with means and standard deviations, for the variables involved in this study are displayed in Table 3.

Insert Table 3 here

Table 3 shows that the socio-demographic and maternal characteristics and the home environment are significantly correlated with the developmental outcomes of children born to teenage mothers; of the eleven hypothesized factors, ten factors were highly related to the children's

Table 3. Zero-Order Correlations, Means, and Standard Deviations for the Variables in Analysis

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1 PIAT	1.00												
2 BPI	-.24***	1.00											
3 Child Age	-.18***	.08*	1.00										
4 Gender	.08**	-.08**	-.03	1.00									
5 Race	.13***	.04	.03	.02	1.00								
6 Residence	-.02	-.00	-.01	-.04	-.28***	1.00							
7 Number of Children	-.22***	.06*	.24***	.04	-.11***	.00	1.00						
8 Father Presence	.16***	-.12***	-.06	.03	.11***	-.12***	.10**	1.00					
9 Family Income	.22***	-.08*	.06	.01	.11***	.03	-.01	.54***	1.00				
10 Age at 1st Birth	.24***	-.07*	-.56***	-.02	.03	.03	.20***	.17***	.15***	1.00			
11Education	.22***	-.05	-.13***	-.02	.04	.08*	-.23***	.01	.16***	.25***	1.00		
12 Self-Esteem	.20***	-.14***	-.07*	.01	.12***	.04	-.11***	.07*	.17***	.12***	.27***	1.00	
13 HOME	.29***	-.17***	-.08*	.05	.18***	.01	-.11***	.40***	.37***	.18***	.18***	.19***	1.00
M	98.42	105.83	11.10	.49	2.09	.76	2.48	.50	23495	17.46	11.25	32.23	96.03
SD	12.48	10.16	2.68	.50	.73	.43	1.11	.50	18948	1.37	1.97	4.07	15.30

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

cognitive outcomes, and eight factors were related to the behavioral outcomes. To be precise, the PIAT was positively correlated with child gender (recall that males were coded 0 and females 1), race (Hispanics were coded 1, Blacks 2, and Non-Blacks, Non-Hispanics 3), father presence, family income, teenage mothers' age at first birth, education, self-esteem, and home environment, and negatively correlated with child age and number of children in the household. On the other hand, the BPI was negatively associated with gender, father presence, family income, teenage mothers' age at first birth, self-esteem, and home environment, and positively associated with child age and number of children; particularly strong were the negative associations of the children's behavior problems with father presence, teenage mothers' self-esteem, and home environment.

Bivariate relationships with the children's developmental outcomes suggest that children who are younger, female, Non-Black, Non-Hispanic, living with less siblings and/or with a father, in more affluent family, born to older teenage mothers, having a mother with higher education and self-esteem, or providing a higher quality of home environment, show higher academic achievement. By comparison, children who are older, male, living with many siblings and/or without a father, in poor family, born to younger teenage mothers, having a mother with weak self-esteem, or providing a lower quality of home environment, are likely to exhibit more behavioral problems.

Besides, the quality of home environments teenage mothers provide was positively associated with race, father presence, family income, teenage mothers' age at first birth, educational level, and self-esteem, while it was

negatively associated with child age and number of children in the household. That is to say, the teenage mothers who are Non-Black, Non-Hispanic, with younger children, less children, spouse present, more family income, higher education and/or self-esteem, and gave birth at older age, provide more optimal home environments for their children.

In addition, child age and teenage mothers' age at first birth were negatively correlated (r = -.556, p = .000), indicating the high probability that older children were born to younger teenage mothers. Also, father presence and family income were strongly correlated (r = .535, p = .000), which might suggest that single teenage mothers and their children are more likely to live in poor conditions. Residence was significantly related to neither the quality of home environments nor the cognitive and behavioral outcomes of children born to teenage mothers.

Multivariate Findings

Child, Family, Maternal Characteristics and Home Environments

Testing the Hypothesis I that the child, family, and maternal characteristics would affect the quality of home environments teenage mothers provide, Table 4 presents the results of a simultaneous regression analysis in which the quality of home environments was regressed on the socio-demographic and maternal characteristics.

Insert Table 4 here

Table 4. Regressions of the Quality of Home Environments on Socio-Demographic and Maternal Characteristics

Independent Variables	B	Beta
Socio-Demographic Characteristics		
Child Age	.013	.002
Gender	1.155	.038
Race1 (W vs. B & H)[a]	4.387	.134**
Race2 (B vs. W & H)[b]	-2.521	-.082
Residence	2.046	.058
Number of Children	-1.030	-.075*
Father Presence	8.125	.266****
Family Income	.001	.141***
Maternal Characteristics		
Age at 1st Birth	.331	.029
Education	2.205	.122***
Self-Esteem	.383	.102**
R square (Adjusted)	.275	(.265)****

[a]Dummy coded with White (Non-Black, Non-Hispanic) = 1; Black, Hispanic = 0.

[b]Dummy coded with Black = 1; White (Non-Black, Non-Hispanic), Hispanic = 0.

*$p < .05$. **$p < .01$. ***$p < .001$. ****$p < .0001$.

As seen in Table 4, father presence was the strongest predictor of the quality of home environments (p = .0000), even after controlling for the maternal characteristics. Also, family income (p = .0002) and teenage mothers' educational level (p = .0005) as well as self-esteem (p = .0018) were strongly associated with the home environment. In regard of race, Non-Blacks, Non-Hispanics (Mean = 102.26) scored significantly higher (p = .0014) than both Blacks (Mean = 91.64) and Hispanics (Mean = 96.00) on the measure of the quality of home environments. Additionally, consistent with previous research (Barratt, 1991; Hannan & Luster, 1991), smaller number of children in the household was modestly associated with better quality of home environments and parenting of teenage mothers.

Contrary to expectations, however, child age and teenage mothers' age at first birth (which had bivariate associations with the home environment) had no significant effects, when number of children, father presence, family income, and teenage mothers' education and self-esteem were included in the regression model. In addition, as Bradley and Caldwell (1984c) noticed in families of adult mothers, no significant effect for child gender was observed in the home environment provided by teenage mothers.

Home Environments and Child Developmental Outcomes

For testing the Hypothesis II that the quality of home environments would influence the child's developmental outcomes, the next analyses were conducted to regress both the cognitive outcomes and the behavioral outcomes of children on the quality of home environments and parenting practices of teenage mothers. Results showed the highly significant

relationship between the quality of home environments and the cognitive (p = .0000) and the behavioral (p = .0000) outcomes of children born to teenage mothers.

To be precise, the optimal parenting and home environments of teenage mothers has a significantly positive influence on the cognitive development of children measured by the PIAT Math, PIAT Reading Recognition, and PIAT Reading Comprehension. In contrast, the positive parenting and home environments displayed by teenage mothers has a significantly negative influence on the behavioral maladjustment of children assessed using the Behavioral Problems Index composed of Antisocial, Anxious, Headstrong, Hyperactive, and Peer Conflict/ Withdrawn. Therefore, the Hypothesis II of this study was strongly accepted.

Influences of Child, Family , Maternal Characteristics and Home Environments on Child Developmental Outcomes

A series of multiple regression analyses were performed in order to test the Hypotheses III and IV that proposed the association between the child, family, and maternal characteristics and the child's developmental outcomes, and the mediational role of home environments in the relationship, respectively. First, as presented in Table 5, the cognitive developmental outcomes of children were regressed on the socio-demographic and maternal characteristics in the first regression, and then the quality of home environments was added in the second regression.

Table 5. Regressions of Cognitive Outcomes on Socio-Demographic, Maternal Characteristics, and Home Environments

Independent Variables	PIAT[c] First Model B	Beta	Second Model B	Beta
Socio-Demographic Characteristics				
Child Age	- .270	-.058	-.271	-.058
Gender	2.053	.082*	1.920	.077*
Race1 (W vs. B & H)[a]	1.714	.064	1.207	.045
Race2 (B vs. W & H)[b]	-2.980	-.119**	-2.689	-.107*
Residence	- .379	-.013	-.616	-.021
Number of Children	-1.574	-.140****	-1.455	-.130***
Father Presence	.656	.026	-.283	-.011
Family Income	.001	.116**	.001	.096*
Maternal Characteristics				
Age at 1st Birth	.778	.084*	.739	.080
Education	1.990	.135***	1.736	.117**
Self-Esteem	.371	.121***	.326	.106**
HOME	____	____	.116	.142***
R square (Adjusted)	.188	(.177)****	.203	(.190)****

[a]Dummy coded with White = 1; Black, Hispanic = 0.

[b]Dummy coded with Black = 1; White, Hispanic = 0.

[c]PIAT is the total PIAT that combined PIAT Math, PIAT Reading Recognition, and PIAT Reading Comprehension.

*$p < .05$. **$p < .01$. ***$p < .001$. ****$p < .0001$.

As seen in the first regression model of Table 5, the number of children in the household was the strongest predictor of the cognitive attainment (p = .0001) of children born to teenage mothers, even after controlling for the maternal characteristics. That is, the larger number of children in the household of teenage mothers was highly related to the less positive outcomes of academic achievement measured by the PIAT. On the other hand, teenage mothers' higher educational level (p = .0002) and stronger self-esteem (p = .0005) had significantly positive influences on the children's cognitive development.

With regard to the race difference, Black (Mean = 95.89) children of teenage mothers had less optimal cognitive outcomes than Non-Black, Non-Hispanic (Mean = 102.14) and Hispanic (Mean = 98.54) counterparts. Consistent with the findings of previous research (Ketterlinus et al., 1991), family income had a significantly positive effect on the cognitive developmental outcomes of children born to teenage mothers. In addition, female children showed a higher score on the measure of cognitive attainment than male children, and teenage mothers' age at first birth affected the children's cognitive outcomes, even with taking other background factors into account.

When the quality of home environments was entered into the second regression model, however, teenage mothers' age at first birth became nonsignificant, which indicates that the home environment influenced the children's cognitive outcomes over the effect of age at first birth of teenage mothers. Besides, with the home environment included in the analysis, the effects of race, number of children, family income, teenage mothers'

education, and self-esteem on the children's cognitive developmental outcomes were reduced to the less statistical significance levels, suggesting that the quality of home environments partially mediated those effects. Still, child gender remained modestly related to the cognitive attainment of children, regardless of whether or not the home environment was included in the regression model. Therefore, the mediational role of home environments was partially confirmed in the aspect of cognitive development of children born to teenage mothers.

As for the behavioral adjustment of children, Table 6 displays the results of analyses in which the behavioral outcomes of children were regressed on the socio-demographic and maternal characteristics in the first regression, and then the quality of home environments was added in the second regression.

Insert Table 6 here

As seen in the first regression model of Table 6, the characteristics of child gender, race (Non-Black, Non-Hispanic vs. Black & Hispanic), father presence, and teenage mothers' self-esteem were significantly associated with the behavioral outcomes of children born to teenage mothers. In particular, teenage mothers' self-esteem (p = .0002) was the strongest predictor of less behavioral difficulties of their children. Also, the presence of a father (p = .0073) in the household of teenage mothers had a significant influence on

Table 6. Regressions of Behavioral Outcomes on Socio-Demographic, Maternal Characteristics, and Home Environments

Independent Variables	BPI[c] First Model B	Beta	Second Model B	Beta
Socio-Demographic Characteristics				
Child Age	.167	.044	.168	.044
Gender	-1.642	-.081*	-1.539	-.076*
Race1 (W vs. B & H)[a]	2.187	.100*	2.580	.118*
Race2 (B vs. W & H)[b]	.975	.048	.750	.037
Residence	.174	.007	.357	.015
Number of Children	.585	.064	.493	.054
Father Presence	-2.370	-.117**	-1.643	-.081
Family Income	-.001	-.007	.001	.012
Maternal Characteristics				
Age at 1st Birth	-.011	-.001	.019	.003
Education	.097	.008	.294	.024
Self-Esteem	-.339	-.136***	-.304	-.122**
HOME	___	___	-.090	-.135***
R square (Adjusted)	.051	(.038)****	.064	(.050)****

[a]Dummy coded with White = 1; Black, Hispanic = 0.

[b]Dummy coded with Black = 1; White, Hispanic = 0.

[c]BPI is the total BPI that combined Antisocial, Anxious, Headstrong, Hyperactive, and Peer Conflict/Withdrawn.

*$p < .05$. **$p < .01$. ***$p < .001$. ****$p < .0001$.

the behavioral adjustment of children. In addition, male (vs. female) children and Non-Black, Non-Hispanic (vs. Black and Hispanic) children showed more behavioral problems measured by the BPI.

When the quality of home environments was entered into the second regression model, however, father presence was no longer associated with the children's behavioral outcomes, suggesting that the home environment mediated the effects of father presence on the children's behavioral problems. In other words, the presence of a father was related to the quality of parenting and home environments of teenage mothers, and in turn, those parenting practices influenced the children's behavioral adjustment. Additionally, the relationship between teenage mothers' self-esteem and their children's behavioral outcomes was lessened to the less significant level, which suggests that the home environment partially mediated the influence of teenage mothers' self-esteem. However, even with the home environment included in the model, the modest effects of child gender and race on the behavioral outcomes of children remained at the significance level ($p < .05$).

In short, the quality of home environments teenage mothers provide for their children mediated the effect of father presence, and partially mediated the influence of teenage mothers' self-esteem, on the children's behavioral problems. Therefore, the mediational role of home environments was also confirmed in the behavioral development of children born to teenage mothers.

V. DISCUSSION

This study addressed the role of home environments as a parenting process of teenage mothers in explaining the relationship between the socio-demographic and maternal characteristics and the developmental outcomes of children. The home environment was proposed as a partial mediator in the cognitive and behavioral development of children born to teenage mothers. The findings from this study reveal the clearest mediational role of home environments for the influence of father presence on the behavioral adjustment of children. This finding suggests that the presence of a father as a nurturing adult in the home contributes to the quality of home environments which, in turn, protects against behavioral problems. One possible reason is that father presence is a source of family support that can be physical, financial, and emotional help for the parenting of teenage mothers. Such supports may lessen the problems or stresses associated with teenage parenting (Nath et al., 1991; Schellenbach et al., 1992). Accordingly, teenage mothers with supports from the father can show greater responsiveness and affection and provide more stimulating rich environments for children.

The optimal parenting practices and home environments of teenage mothers, in turn, contribute to better behavioral adjustment of their children. As the mothers who provide positive home environments can sensitively and properly respond to the needs or states of children, the children may have less emotional tension, pressures, or conflicts so that they display less problematic behaviors like headstrong, hyperactive, and/or antisocial

problems. Rogers et al. (1991) argued that adequate parenting behaviors and strategies are necessary in order for children to internalize appropriate norms and values of social control. Whereas parental coercive control and harsh physical punishment are likely to generate maladjustment and mental health problems in children (McLeod & Shanahan, 1993), positive parenting styles and environments are likely to encourage children to cope with and solve problems, which can be associated with greater social competence and fewer behavioral problems.

It is noteworthy, indeed, that the home environment as a parenting of teenage mothers is the most powerful predictor for both the cognitive and the behavioral outcomes of children, even after controlling for all the socio-demographic and maternal characteristics included in the study. These findings further support the view that home environments significantly contribute to the optimal development of children (Bradley & Caldwell, 1984a; Bradley et al., 1988). Previous research on teenage mothers indicated that teenage mothers, on average, display less stimulating and responsive verbal interactions with their children, and such less verbal parenting environment has a negative consequence for the development of children (Field et al., 1990; Garcia Coll et al., 1986). This study, however, observes variance in the quality of home environments of teenage mothers which considerably influences the developmental outcomes of children. That is to say, when teenage mothers provide their children with rich environmental experiences, such as stimulating materials, sufficient activities, and supportive responses to children, the children's development is highly attained. On the contrary, if children have mothers who construct less

favorable home environments, their development is more likely to be undermined. Moreover, the study shows that teenage mothers' age at first birth is unrelated to the quality of home environments when the effects of other background factors are taken into account. The findings of this study, therefore, suggest that the development of children born to teenage mothers may not be determined at the time of the child's birth, but benefit from adequate parenting and optimal home environments provided by teenage mothers.

Predictors of the Quality of Home Environments and Parenting

In predicting the quality of home environments teenage mothers provide for their children, the present study proposed that the home environment is a function of socio-demographic and maternal characteristics. The findings from this study reveal that socio-demographic characteristics such as race, number of children, father presence, and family income, and maternal characteristics like teenage mothers' education and self-esteem are significant predictors for the home environment of children born to teenage mothers. As noted earlier, in particular, father presence is the strongest predictor of the optimal quality of home environments, and it holds even when family income is controlled; it implies, thus, that father presence in the home is not only financial resources, but also a source of emotional support for the positive parenting of teenage mothers.

It is not surprising, indeed, that family income has highly significant effects on the quality of home environments. Teenage mothers in poor economic conditions have less financial resources for providing sufficient

materials and stimulating experiences for children. Economic hardship is also associated with higher levels of psychological distress (McLoyd, 1990) which may contribute to harsh or unresponsive parenting. Similarly, the educational level of teenage mothers is positively related to their parenting quality. One explanation may be that mothers' education relates to more knowledge of child development and parenting practices, and that this knowledge contributes to desirable parenting attitudes and behaviors (Schellenbach et al., 1992). Among teenage mothers, then, attaining more education is associated with the better quality of home environments provided for children.

It is also important to recognize that the parenting of teenage mothers is influenced by the personal characteristics that these mothers bring to their parenting tasks. The findings of this study suggest that self-esteem of teenage mothers helps make better adjustment to their parenting; psychologically mature mothers with strong sense of self-esteem exhibit more positive and/or effective parenting practices. Thus, teenage mothers who possess weaker and less positive self-esteem may have more difficulty dealing with the problems they face in the parenting situations. This finding lends further support to the argument that not only family conditions, but also maternal personal resources are important in constructing strong home environments for children (Menaghan & Parcel, 1991).

Even when other background factors (e.g., father presence, family income, maternal education, etc.) are controlled, the present study shows that White children of teenage mothers have higher scores on the measure of home environments than Black or Hispanic counterparts. These findings

seem to reflect racial/ethnic differences in the parenting and home environments for children. In a study of the qualities of adolescent mothers' parenting, East et al. (1994) also found similar results of parenting differences among White, Black, and Hispanic mothers while they used different parenting measures with small subgroup sample sizes. Since these racial variations in parenting appeared independent of the effects of the socioeconomic status of families, it can be assumed that some other factors (e.g., parental value systems, life styles, etc.) contribute to the parenting differences of teenage mothers. Finally, the negative impact of the number of children in the household of teenage mothers on the quality of home environments emerges, presumably because the economic and/or maternal resources that are essential to providing strong home environments may be distributed among larger numbers of children.

Characteristics Related to Child Developmental Outcomes

Regarding the developmental outcomes of children born to teenage mothers, the present study indicates that they are influenced by several socio-demographic and maternal characteristics. After the overall quality of home environments, teenage mothers' psychological attribute of self-esteem is a strong predictor for both the cognitive attainment and the behavioral adjustment of these children, which implies that psychological resources of teenage mothers are crucial for promoting the optimal development of children. Positive self-esteem of teenage mothers enhances their capacity to be sensitive in meeting the intellectual, social, or emotional needs of their children and effectively responding to the children's difficulties (Kandel et

al., 1994; Whitman et al., 1987). Teenage mothers with strong self-esteem may consider that the children's problems are within their control, and such maternal competence and self-worth can contribute to the positive development of children.

Note that the effects of child gender on the both cognitive and behavioral outcomes are independent of the effects of other socio-demographic and maternal characteristics, and they persist even when the effects of home environments are controlled. The findings in this study are compatible with prior research findings that female children show significantly higher scores on the measure of academic achievement, particularly on reading recognition. Using the sample of children born to teenage and older mothers, Ketterlinus et al. (1991) found that females had better scores on the PIAT reading. Also, the findings that male children of teenage mothers show higher scores on the measure of behavioral problems (especially, hyperactive and antisocial problems) further support the argument that male children display more behavior problems (Leadbeater & Bishop, 1994). Rogers et al. (1991) also reported greater aggressiveness of boys of adult mothers.

Apparently, this study presents different patterns of relationships between race/ethnicity and the developmental outcomes of children born to teenage mothers. Even after controlling for the home environment as well as other socio-demographic and maternal characteristics, Black children of teenage mothers show less positive cognitive outcomes (primarily more reading problems), while White children of teenage mothers show more behavioral problems of anxious and headstrong difficulties. These differences

in the child outcomes among the three racial groups tend to accord the argument that "Black, White, and Hispanic children in the U.S. are generally exposed to very different social, economic, cultural, and educational experiences" (Ketterlinus et al., 1991, p. 185). The racial differences of child development, thus, may be a multiple function of differences in social resources, cultural systems, and/or socializing contexts.

The number of children, family income, and teenage mothers' educational level are additional important predictors for the cognitive outcomes of children. Most notably, the findings that children from the household of teenage mothers with larger numbers of children substantially show developmental deficits in the cognitive domain, are consistent with the view that crowded conditions in the home tend to limit children's exploratory and reading activities which may lead to the depressed academic competence and achievement of children. The mothers having many children may involve less actively with each of the children's academic activities as well. This finding strengthens the argument that additional birth of teenage mothers has a significantly negative effect on the cognitive development of children (Brooks-Gunn & Chase-Lansdale, 1995).

It is interesting to note that maternal education and family income significantly influence the academic achievement of children even when controlling for the quality of home environments. The children of teenage mothers with more education show greater academic ability and performance, perhaps because the mothers' cognitive resources enhance the cognitive competence of children (Moore & Snyder, 1991). Likewise, family income as financial resources enriches the children's academic activities and

accomplishment. These findings also support the view that low educational attainment and poverty status of teenage mothers are important predictors of less academic achievement for their children (Brooks-Gunn & Furstenberg, 1986; Furstenberg et al., 1987).

There are some limitations in the present study. First of all, this study was conducted based on the participants who were teenage mothers at the time of first birth and their firstborn children; the findings from this study, therefore, could not be generalized to other populations beyond those sample definition. Second, using the secondary dataset, the study acknowledges restriction of variables or measures that may challenge and advance full understanding of the relationship between parenting behaviors of teenage mothers and developmental characteristics of children. Though this study is focused on the home environment as a parenting dimension, for instance, other features of teenage mothers' parenting practices, such as disciplinary and control strategies, parenting attitudes or values, or perhaps more importantly, maternal psychological components of depression, stress, and/or perceptions of children, remain a research area in need of further attention. Besides, future research on children of teenage mothers would profit from considering more varied child developmental dimensions, such as social competence as a measure of the child's positive socioemotional outcomes. Third, although this study is strengthened by its inclusion of all ages of children born to teenage mothers surveyed, this attempt limited the examination on child characteristics (e.g., temperament for youngers, or self-concept for olders) as influences on parenting behaviors and home

environments. Because the child is an active participant in parent-child interactions and not a passive recipient of environments (Maccoby & Martin, 1983), child effects on parenting by teenage mothers need attention as well. Reciprocal or bidirectional relations between teenage mothers' parenting and child development await further investigation.

In sum, this study provides empirical evidence that the home environment of teenage mothers plays a significant role in both the academic achievement and the behavioral problems of children. The proposition of home environments as a partial mediator in the child outcomes is positively supported in the association of father presence with the behavioral adjustment of children. These findings underscore the importance of parenting environments for producing more favorable outcomes of children and have substantial implications for teenage parenting practices. When teenage mothers live without a father, they are more likely to provide poor quality of home environments, which increases the risk of behavioral problems in children. Parenting efforts, thus, should be made for the single teenage mothers to provide strong home environments for their children. Furthermore, evidencing that teenage mothers' age at first birth is not a crucial factor predicting either the quality of home environments or the developmental outcomes of children, the present study suggests that the development of children born to teenage mothers is not determined but can be enhanced by the optimal parenting and home environments that promote positive developmental outcomes of children.

REFERENCES

Achenbach, T. M., & Edelbrock, C. (1981). Behavioral problems and competences reported by parents of normal and disturbed children aged four through sixteen. *Monographs of the Society for Research in Child Development, 46 (1,Serial No. 188).*

Astone, N. M. (1993). Are adolescent mothers just single mothers? *Journal of Research on Adolescence, 3(4),* 353-371.

Baker, P. C., Keck, C. K., Mott, F. L., & Quinlan, S. V. (1993). *NLSY child handbook: A guide to the 1986-1990 National Longtidunal Survey of Youth child data (Rev. Ed.).* Columbus: Center for Human Resource Research, The Ohio State University.

Baldwin, W. (1993). The consequences of early childbearing: A perspective. *Journal of Research on Adolescence, 3(4),* 349-352.

Baldwin, W., & Cain, V. S. (1981). The children of teenage parents. In F. F. Furstenberg, Jr., R. Lincoln, & J. Menken (Eds.), *Teenage sexuality, pregnancy, and childbearing* (pp. 265-279). Philadelphia: University of Pennsylvania Press.

Baron, R. M., & Kenny, D. A. (1986). The moderator - mediator variable distinction in social psychological research: Conceptual, strategic, and situational considerations. *Journal of Personality and Social Psychology, 51,* 1173-1182.

Barratt, M. S. (1991). School-age offspring of adolescent mothers: Environments and outcomes. *Family Relations, 40,* 442-447.

Barratt, M. S., & Roach, M. A. (1995). Early interactive processes: Parenting by adolescent and adult single mothers. *Infant Behavior and Development, 18,* 97-109.

Barth, R. P., Schinke, S. P., & Maxwell, J. S. (1983). Psychological correlates of teenage motherhood. *Journal of Youth and Adolescence, 12(6),* 471-487.

Baydar, N., & Brook-Gunn, J. (1991). Effects of maternal employment and child-care arrangements of preschoolers' cognitive and behavioral outcomes: Evidence from the Children of the National Longitudinal Survey of Youth. *Developmental Psychology, 27(6),* 932-945.

Belsky, J. (1984). Determinants of parenting: A process model. *Child Development, 55,* 83-96.

Belsky, J., & Eggebeen, D. (1991). Early and extensive maternal employment and young children's socioemotional development: Children of the National Longitudinal Survey of Youth. *Journal of Marriage and the Family, 53,* 1083-1110.

Benson, M. J., Larson, J., Wilson, S. M., & Demo, D. H. (1993). Family of origin influences on late adolescent romantic relationships. *Journal of Marriage and the Family, 55,* 663-672.

Bradley, R. H. (1982). The HOME inventory: A review of the first fifteen years. In N. J. Anastasiow, W. Frankenburg, & A. Fandall (Eds.), *Identifying the developmentally delayed child* (pp. 87-100). Baltimore: University Park Press.

Bradley, R. H. (1985). The home enventory: Rationale & research. In J. E. Stevenson (Ed.), *Recent research in developmental psychopathology*

(pp. 191-201). A Book Supplement to the Journal of Child Psychology and Psychiatry, No. 4. New York: Pergamon Press.

Bradley, R. H. (1995). Environment and parenting. In M. H. Bornstein (Ed.), *Handbook of parenting. Vol. 2: Biology and ecology of parenting* (pp.235-261). Mahwah, NJ: Lawrence Erlbaum.

Bradley, R. H. & Caldwell, B. M. (1984a). 174 children: A study of the relationship between home environment and cognitive development during the first 5 years. In A. W. Gottfried (Ed.), *Home environment and early cognitive development: Longitudinal research* (pp. 5-56). New York: Academic Press.

Bradley, R. H., & Caldwell, B. M. (1984b). The relation of infants' home environments to achievement test performance in first grade: A follow-up study. *Child Development, 55,* 803-809.

Bradley, R. H., & Caldwell, B. M. (1984c). The HOME inventory and family demographics. *Developmental Psychology, 20(2),* 315-320.

Bradley, R. H., Caldwell, B. M., & Rock, S. L. (1988). Home environment and school performance: A ten-year follow-up and examination of three models of environmental action. *Child Development, 59,* 852-867.

Bradley, R. H., Caldwell, B. M., & Rock, S. L. (1990). A system for describing elements of the environment: Model for assessing the home environments of developing children. *Early Education and Development, 1,* 237-265.

Bradley, R. H., Caldwell, B. M., Rock, S. L., Hamrick, H. M., & Harris, P. (1988). Home observation for measurement of the environment: Development of a Home Inventory for use with families having

children 6 to 10 years old. *Contemporary Educational Psychology, 13,* 58-71.

Bradley, R. H., Caldwell, B. M., Rock, S. L., Ramey, C. T., Barnard, K. E., Gray, C., Hammond, M. A., Mitchell, S., Gottfried, A. W., Siegel, L., & Johnson, D. L. (1989). Home environment and cognitive edvelopment in the first 3 years of life: A collaborative study involving six sites and three ethnic groups in North America. *Developmental Psychology, 25(2),* 217-235.

BrooksGunn, J., & Chase-Lansdale, P. L. (1995). Adolescent parenthood. In M. H. Bornstein (Ed.), *Handbook of parenting. Vol. 3: Status and social conditions of parenting* (pp.113-149). Mahwah, NJ: Lawrence Erlbaum.

Brooks-Gunn, J., & Furstenberg, F. F. Jr. (1986). The children of adolescent mothers: Physical, academic, and psychological outcomes. *Developmental Review, 6,* 224-251.

Brooks-Gunn, J., & Furstenberg, F. F. Jr. (1987). Continuity and change in the context of poverty: Adolescent mothers and their children. In J. J. Gallagher & C. T. Ramey (Eds.), *The malleability of children* (pp. 171-188). Baltimore: Brooks.

Brooks-Gunn, J., Phelps, E., & Elder, G. H. Jr. (1991). Studying lives through time: Secondary data analyses in developmental psychology. *Developmental Psychology, 27(6),* 899-910.

Buchholz, E. S., & Korn-Bursztyn, C. (1993). Children of adolescent mothers: Are they at risk for abuse? *Adolescence, 28(110),* 361-382.

Caldwell, B. M., & Bradley, R. H. (1984). *Home observation for measurement of the environment.* Little Rock: University of Arkansas at Little Rock.

Card, J. J. (1981). Long-term consequences for children of teenage parents. *Demography, 18(2),* 137-156.

Center for Human Resource Research (1992). *1990 child assessment data users' guide.* Columbus: Center for Human Resource Research, The Ohio State University.

Center for Human Resource Research (1993a). *NLS handbook 1993: The National Longitudinal Surveys.* Columbus: Center for Human Resource Research, The Ohio State University.

Center for Human Resource Research (1993b). *NLS users' guide 1993.* Columbus: Center for Human Resource Research, The Ohio State University.

Chase-Lansdale, P. L., Brooks-Gunn, J., & Paikoff, R. L. (1991). Research and programs for adolescent mothers: Missing links and future promises. *Family Relations, 40,* 396-403.

Chase-Lansdale P. L., Brooks-Gunn, J., & Zamsky, E. S. (1994). Young African-American multigenerational families in poverty: Quality of mothering and grandmothering. *Child Development, 65,* 373-393.

Chase-Lansdale, P. L., Mott, F. L., Brooks-Gunn, J., & Phillips, D. A. (1991). Children of the National Longitudinal Survey of Youth: A unique research opportunity. *Developmental Psychology,* 27(6), 918-931.

Conger, R. D., McCarty, J. A., Yang, R. K., Lahey, B. B., & Burgess, R. L. (1984). Mother's age as a predictor of observed maternal behavior in

three independent samples of families. *Journal of Marriage and the Family, 46*, 411-424.

Cooley, M. L., & Unger, D. G. (1991). The role of family support in determining developmental outcomes in children of teen mothers. *Child Psychiatry and Human Development, 21(3)*, 217-234.

Crockenberg, S. (1987). Predictors and correlates of anger toward and punitive control of toddlers by adolescent mothers. *Child Development, 58*, 964-975.

Culp, R., Culp, A. M., Osofsky, J. D., & Osofsky, H. J. (1991). Adolescent and older mothers' interaction patterns with their six-month-old infants. *Journal of Adolescence, 14*, 195-200.

Darabi, K. F., Graham, E. H., Namerow, P. B., Philliber, S. G., & Varga, P. (1984). The effect of maternal age on the well-being of children. *Journal of Marriage and the Family, 46*, 933-936.

Desai, S., Chase-Lansdale, P. L., & Michael, R. T. (1989). Mother of market? Effects of maternal employment on the intellectual ability of 4-year-old children. *Demography, 26(4)*, 545-561.

Dubow, E. F., & Luster, T. (1990). Adjustment of children born to teenage mothers: The contribution of risk and protective factors. *Journal of Marriage and the Family, 52*, 393-404.

East, P. L., Matthews, K. L., & Felice, M. E. (1994). Qualities of adolescent mothers' parenting. *Journal of Adolescent Health, 15,* 163-168.

Elardo, R., & Bradley, R. H. (1981). The home observation for measurement of the environment (HOME) scale: A review of research. *Developmental Review, 1*, 113-145.

Elster, A. B., McAnarney, E. R., & Lamb, M. E. (1983). Parental behavior of adolescent mothers. *Pediatrics, 71(4),* 494-503.

Field, T., Widmayer, S., Adler, S., & De Cubas, M. (1990). Teenage parenting in different cultures, family constellations, and caregiving enviornment: Effects on infant development. *Infant Mental Health Journal, 11(2),* 158-174.

Franklin, D. L. (1988). The impact of early childbearing on developemntal outcomes: The case of Black adolescent parenting. *Family Relations, 37,* 268-274.

Furstenberg, F. F. Jr. (1991). As the pendulum swings: Teenage childbearing and social concern. *Family Relations, 40,* 127-138.

Furstenberg, F. F. Jr., Brooks-Gunn, J., & Chase-Lansdale, L. (1989). Teenaged pregnancy and childbearing. *American Psychologist, 44(2),* 313-320.

Furstenberg, F. F. Jr., Brooks-Gunn, J., & Morgan, S. P. (1987). *Adolescent mothers in later life.* Cambridge: Cambridge University Press.

Furstenberg, F. F. Jr., Levine, J. A., & Brooks-Gunn, J. (1990). The children of teenage mothers: Patterns of early childbearing in two generations. *Family Planning Perspectives, 22(2),* 54-61.

Furstenberg, F. F. Jr., Lincoln, R., & Menken, J. (Eds.). (1981). *Teenage sexuality, pregnancy, and childbearing.* Philadelphia: University of Pennsylvania Press.

Garcia Coll, C. T., Hoffman, J., & Oh, W. (1987). The social ecology and early parenting of Caucasian adolescent mothers. *Child Development, 58,* 955-963.

Garcia Coll, C. T., Hoffman, J., Van Houten, L. J., & Oh, W. (1987). The social context of teenage childbearing: Effects of the infant's care-giving environment. *Journal of Youth and Adolescence, 16(4)*, 345-360.

Garcia Coll, C. T., Vohr, B. R., Hoffman, J., & Oh, W. (1986). Maternal and environmental factors affecting developmental outcome of infants of adolescent mothers. *Developmental and Behavioral Pediatrics, 7(4)*, 230-236.

Garrett, P., Ng'andu, N., & Ferron, J. (1994). Poverty experiences of young children and the quality of their home enviornments. *Child Development, 65,* 331-345.

Gottfried, A. W. (Ed.). (1984). *Home environment and early cognitive development: Longitudinal research.* New York: Academic Press.

Hannan, K., & Luster, T. (1991). Influence of parent, child, and contextual factors on the quality of the home environment. *Infant Mental Health Journal, 12(1)*, 17-30.

Harnish, J. D., Dodge, K. A., & Valente, E. (1995). Mother-child interaction quality as a partial mediator of the roles of maternal depressive symptomatology and socioeconomic status in the development of child behavior problems. *Child Development, 66,* 739-753.

Hayes, C. D. (1987). *Risking the future: Adolescent sexuality, pregnancy, and chilldbearing* (Vol. 1). Washington, D.C.: National Academy Press.

Hechtman, L. (1989). Teenage mothers and their children: Risks and problems: A review. *Canadian Journal of Psychiatry, 34,* 569-575.

Hofferth, S. L. (1987). The children of teen childbearers. In S. L. Hofferth & C. D. Hayes (Eds.), *Risking the future: Adolescent sexuality, pregnancy,*

and childbearing (Vol. 2, pp. 174-206). Washington, D.C.: National Academy Press.

Hubbs-Tait, L., Osofsky, J.D., Hann, D.M., & Culp, A.M. (1994). Predicting behavior problems and social competence in children of adolescent mothers. *Family Relations, 43,* 439-446.

Kandel, D. B., Rosenbaum, E., & Chen, K. (1994). Impact of maternal drug use and life experiences on preadolescent children born to teenage mothers. *Journal of Marriage and the Family, 56,* 325-340.

Ketterlinus, R. D., Henderson, S., & Lamb, M. E. (1991). The effects of maternal age-at-birth on children's cognitive development. *Journal of Research on Adolescence, 1(2),* 173-188.

Kinard, E. M., & Reinherz, H. (1987). School aptitude and achievement in children of adolescent mothers. *Journal of Youth and Adolescence, 16(1),* 69-87.

Leadbeater, B. J., & Bishop, S. J. (1994). Predictors of behavior problems in preschool children of inner-city Afro-American and Puerto Rican adolescent mothers. *Child Development, 65,* 638-648.

Levine, L., Garcia Coll, C.T., & Oh, W. (1985). Determinants of mother-infant interaction in adolescent mothers. *Pediatrics, 75(1),* 23-29.

Lewit, E. M. (1992). Teenage childbearing. *The Future of Children, 2,* 186-191.

Luster, T., & Dubow, E. (1990). Predicators of the quality of the home environment that adolescent mothers provide for their school-aged children. *Journal of Youth and Adolescence, 19(5),* 475-494.

Luster, T., & Dubow, E. (1992). Home environment and maternal intelligence as predictors of verbal intelligence: A comparison of preschool and school-age children. *Merrill-Palmer Quarterly, 38(2),* 151-175.

Luster, T., & Mittelstaedt, M. (1993). Adolescent mothers. In T. Luster & L. Okagaki (Eds.), *Parenting: An ecological perspectives* (pp. 69-99). Hillsdale, NJ: Lawrence Erlbaum.

Luster, T., & Rhodes, K. (1989). The relation between child-rearing beliefs and the home environment in a sample of adolescent mothers. *Family Relations, 38,* 317-322.

Maccoby, E. E., & Martin, J. A. (1983). Socialization in the context of the family: Parent-child interaction. In P. H. Mussen (Ed.), *Handbook of child psychology. 4th ed. Vol. IV: Socialization, personality, and social development (pp. 1-101).* New York: John Wiley & Sons.

McAnarney, E. R. (1985). Adolescent pregnancy and childbearing: New data, new challenges. *Pediatrics, 75(5),* 973-975.

McAnarney, E. R., Lawrence, R. A., Ricciuti, H. N., Polley, J., & Szilagyi, M. (1986). Interactions of adolescent mothers and their 1-year-old children. *Pediatrics, 78(4),* 585-590.

McLaughlin, S. D., & Micklin, M. (1983). The timing of the first birth and changes in personal efficacy. *Journal of Marriage and the Family, 45,* 47-55.

McLeod, J. D., & Shanahan, M. J. (1993). Poverty, parenting, and children's mental health. *American Sociological Review, 58,* 351-366.

McLoyd, V. C. (1990). The impact of economic hardship on Black families and children: Psychological distress, parenting, and socioemotional development. *Child Development, 61,* 311-346.

Menaghan, E. G., & Parcel, T. L. (1991). Determining children's home environments: The impact of maternal characteristics and current occupational and family conditions. *Journal of Marriage and the Family, 53,* 417-431.

Menaghan, E. G., & Parcel, T. L. (1995). Social sources of change in children's home environments: The effects of parental occupational experiences and family conditions. *Journal of Marriage and the Family, 57,* 69-84.

Miller, B. C., & Moore, K. A. (1990). Adolescent sexual behavior, pregnancy, and parenting: Research through the 1980s. *Journal of Marriage and the Family, 52,* 1025-1044.

Moore, K. A., Simms, M. C., & Betsey, C. L. (1986). *Choice and circumstance: Racial differences in adolescent sexuality and fertility.* New Brunswick: Transaction.

Moore, K. A., & Snyder, N. O. (1991). Cognitive attainment among firstborn children of adolescent mothers. *American Sociological Review, 56,* 612-624.

Nath, P. S., Borkowski, J. G., Whitman, T. L., & Schellenbach, C. J. (1991). Understanding adolescent parenting: The dimensions and functions of social support. *Family Relations, 40,* 411-420.

Nitz, K., Ketterlinus, R.D., & Brandt, L.J. (1995). The role of stress, social support, and family enviornment in adolescent mothers' parenting. *Journal of Adolescent Research, 10(3),* 358-382.

Norusis, M. J. (1993). *SPSS: SPSS for Window Base System User's Guide Release 6.0.* Chicago, IL: SPSS Inc.

Parcel, T. L., & Menaghan, E. G. (1993). Family social capital and children's behavior problems. *Social Psychology Quarterly, 56(2),* 120-135.

Passino, A. W., Whitman, T. L., Borkowski, J. G., Schellenbach, C. J., Maxwell, S. E., Keogh, D., & Rellinger, E. (1993). Personal adjustment during pregnancy and adolescent parenting. *Adolescence, 28(109),* 97-122.

Patterson, C. J., Kupersmdt, J. B., & Vaden, N. A. (1990). Income level, gender, ethnicity, and household composition as predictors of children's school-based competence. *Child Development, 61,* 485-494.

Pedhazur, E. J. (1982). *Multiple regression in behavioral research: Explanation and prediction. 2nd ed.* Holt, Rinehart and Winston, Inc.

Philliber, S. G., & Graham, E. H. (1981). The impact of age of mother on mother-child interaction patterns. *Journal of Marriage and the Family, 43,* 109-115.

Ragozin, A. S., Basham, R. B., Crnic, K. A., Greenberg, M. T., & Robinson, N. M. (1982). Effects of maternal age on parenting role. *Developmental Psychology, 18(4),* 627-634.

Reis, J. S., & Herz, E. J. (1987). Correlates of adolescent parenting. *Adolescence, 22(87),* 599-609.

Rogers, S. J., Parcel, T. L., & Menaghan, E. G. (1991). The effects of maternal working conditions and mastery on child behavior problems: Studying the intergenerational transmission of social control. *Journal of Health and Social Behavior, 32(2),* 145-164.

Roosa, M. W. (1991). Adolescent pregnancy programs collection: An introduction. *Family Relations, 40,* 370-372.

Roosa, M. W., Fitzgerald, H. E., & Carlson, N. A. (1982). A comparison of teenage and older mothers: A systems analysis. *Journal of Marriage and the Family, 44,* 367-377.

Roosa, M., & Vaughan, L. (1984). A comparison of teenage and older mothers with preschool age children. *Family Relations, 33,* 259-265.

Ruch-Ross, H. S., Jones, E. D., & Musick, J. S. (1992). Comparing outcomes in a statewide program for adolescent mothers with outcomes in a national sample. *Family Planning Perspectives, 24(2),* 66-71, 96.

Rutter, M. (1981). The city and the child. *American Journal of Orthopsychiatry, 51,* 610-625.

Rutter, M. (1987). Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry, 57,* 316-331.

Samuels, V. J., Stockdale, D. F., & Crase, S. J. (1994). Adolescent mother's adjustment to parenting. *Journal of Adolescence, 17,* 427-443.

Schellenbach, C. J., Whitman, T. L., & Borkowski, J. G. (1992). Toward an integrative model of adolescent parenting. *Human Development, 35,* 81-99.

Schilmoeller, G. L., & Baranowski, M. D. (1985). Childrearing of firstborns by adolescent and older mothers. *Adolescence, 20(80),* 805-822.

Schilmoeller, G. L., Baranowski, M. D., & Higgins, B. S. (1991). Long-term support and personal adjustment of adolescent and older mothers. *Adolescence, 26(104),* 787-797.

Shapiro, J. R., & Mangelsdort, S. C. (1994). The determinants of parenting competence in adolescent mothers. *Journal of Youth and Adolescence, 23(6),* 621-641.

Simkins, L. (1984). Consequences of teenage pregnancy and motherhood. *Adolescence, 19(73),* 39-54.

Stevens, J. H. Jr. (1984). Black grandmothers' and Black adolescent mothers' knowledge about parenting. *Developmental Psychology, 20(6),* 1017-1025.

Stevens, J. H. Jr. (1988). Social support, locus of control, and parenting in three low-income groups of mothers: Black teenagers, Black adults, and White adults. *Child Development, 59,* 635-642.

Unger, D. G., & Cooley, M. (1992). Partner and grandmother contact in Black and White teen parent families. *Journal of Adolescent Health, 13,* 546-552.

Unger, D. G., & Wandersman, L. P. (1985). Social support and adolescent mothers: Action research contributions to theory and application. *Journal of Social Issues, 41(1),* 29-45.

Unger, D. G., & Wandersman, L. P. (1988). The relation of family and partner support to the adjustment of adolescent mothers. *Child Development, 59,* 1056-1060.

U. S. Bureau of the Census (1995). Statistical Abstract of the United States. U.S. Government Printing Office.

Wadsworth, J., Taylor, B., Osborn, A., & Butler, N. (1984). Teenage mothering: Child development at five years. *Journal of Child Psychology and Psychiatry, 25(2)*, 305-313.

Whitman, T. L., Borkowski, J. G., Schellenbach, C. J., & Nath, P. S. (1987). Predicting and understanding developmental delay of children of adolescent mothers: A multidimensional approach. *American Journal of Mental Deficiency, 92(1)*, 40-56.

Appendix A: The HOME-SF

Maternal Reports of the HOME

(Part C: For Children who are at least 6 years, but less than 10 years old) [a]

1. About how many books does your child have?

   (: 0 = 0 to 9; 1 = 10 or more)

2. About how often do you read stories to your child?

   (: 0 = Never to About once a week; 1 = At least 3 times a week to Every day)

3. How often is your child expected to do each of the following?

   (: 0 = If at least 3 of the 4 items (a-d) are almost never; 1 = Else)

   a. Make his/her own bed?

   b. Clean his/her own room?

   c. Clean up after spills?

   d. Bathe himself/herself?

4. How often is your child expected to do pick up after himself/herself?

   (: 0 = Almost never; 1 = Less than 1/2 the time to Almost always)

5. Is there a musical instrument (for example, piano, drum, guitar, etc.) that your child can use here at home? (: 0 = No; 1 = Yes)

6. Does your family get a daily newspaper? (: 0 = No; 1 = Yes)

7. About how often does your child read for enjoyment?

   (: 0 = Never to Several times a month; 1 = Several times a week to Every day)

8. Does your family encourage your child to start and keep doing hobbies? (: 0 = No; 1 = Yes)

9. Does your child get special lessons or belong to any organization

that encourages activities such as sports, music, art, dance, drama, etc.? (: 0 = No; 1 = Yes)

10. How often has any family member taken or arranged to take your child to any type of museum (children's, scientific, art, historical, etc.) within the past year?

    (: 0 = Never; 1 = Once or twice to About once a week or more often)

11. How often has a family member taken or arranged to take your child to any type of musical or theatrical performance within the past year?

    (: 0 = Never; 1 = Once or twice to About once a week or more)

12. About how often does your whole family get together with relatives or friends?

    (: 0 = Once a year or less to About once a month; 1 = Two or three times a month to About once a week or more)

13. About how often does your child spend time with his/her father, step father, or father-figure?

    (: 0 = No father, step father, or father-figure to About once a week; 1 = At least 4 times a week to Once a day or more often)

14. About how often does your child spend time with his/her father, step father, or father-figure in outdoor activities?

    (: 0 = No father, step father, or father-figure to About once a month; 1 = About once a week to Once a day or more often)

15. How often does your child eat a meal with both mother and father (step father or father-figure)?

    (: 0 = No father, step father, or father-figure to Several times a

week; 1 = Once a day to More than once a day)

16. When your family watches TV together, do you or your child's father (or step father of father-figure) discuss TV programs with him/her? (: 0 = No; 1 = Yes)
17. Sometimes children get so angry at their parents that they say things like "I hate you" or swear in a temper tantrum. Please check which actions you would take if this happened.

(: 0 = If b is answered; 1 = Else)

a. Grounding

b. Spanking

c. Talk with child

d. Give him or her household chore

e. Ignore it

f. Send to room for more than 1 hour

g. Take away his/her allowance

h. Take away TV or other privileges

i. Other (: 0 = Harsh response; 1 = Non-harsh response)

18. Sometimes kids mind pretty well and sometimes they don't. Sometime they do things that make you feel good. How many times in the past week have you had to spank your child?

(0 = If more than once; 1 = Else)

Interviewer Observations of Home Environment

(Part C: Child 6 years and Older)

19. (Mother/Guardian) encouraged child to contribute to the

conversation. (: 0 = No; 1 = Yes)

20. (Mother/Guardian) answered child's questions or requests verbally. (: 0 = No; 1 = Yes)
21. (Mother/Guardian) conversed with child excluding scolding or suspicious comments. (: 0 = No; 1 = Yes)
22. (Mother/Guardian), introduced interviewer to child by name. (: 0 = No; 1 = Yes)
23. (Mother/Guardian)'s voice conveyed positive feeling about this child. (: 0 = No; 1 = Yes)
24. Interior of the home is dark or perceptually monotonous. (: 0 = Yes; 1 = No)
25. All visible rooms of the house/apartment are reasonably clean. (: 0 = No; 1 = Yes)
26. All visible rooms of the house/apartment are minimally cluttered. (: 0 = No; 1 = Yes)
27. Building has no potentially dangerous structural or health hazards within a school-aged child's range. (: 0 = No; 1 = Yes)

[a] *(Part D: For Children who are 10 years and older)*:

The questions are the same as those for children who are 6 to 9 years old, except Q2 is deleted; Q3c and Q3d are changed to "Help keep shared living areas clean and straight?" and "Do routine chores such as mow the lawn, help with dinner, wash dishes, etc.?", respectively; and Q4, "How often is your child is expected to do help manage his/her own time (get up on time, be ready for school, etc.)?", is added.

Appendix B: The Behavioral Problems Index

[B] 1. He/She has sudden changes in mood or feeling.

[B] 2. He/She feels or complains that no one loves him/her.

[C] 3. He/She is rather high strung, tense and nervous.

[A] 4. He/She cheats or tells lies.

[B] 5. He/She is too fearful or anxious.

[C] 6. He/She argues too much.

[D] 7. He/She has difficulty concentrating, cannot pay attention for long.

[D] 8. He/She is easily confused, seems to be in a fog.

[A] 9. He/She bullies of is cruel of mean to others.

[C]10. He/She is disobedient at home.

[A]11. He/She does not seem to feel sorry after he/she misbehaves.

[E]12. He/She has trouble getting along with other children.

[D]13. He/She is impulsive, or acts without thinking.

[B]14. He/She feels worthless or inferior.

[E]15. He/She is not liked by other children.

[D]16. He/She has a lot of difficulty getting his/her mind off certain thoughts (has obsessions).

[D]17. He/She is restless or overly active, cannot sit still.

[C]18. He/She is stubborn, sullen, or irritable.

[C]19. He/She has a very strong temper and loses it easily.

[B]20. He/She is unhappy, sad, or depressed.

[E]21. He/She is withdrawn, does not get involved with others.

[A]22. He/She breaks things on purpose or deliberately destroys his/her own or another's things.

[A]23. He/She is disobedient at school.

[A]24. He/She has trouble getting along with teachers.

* A: Antisocial (6 items)
* B: Anxious (5 items)
* C: Headstrong (5 items)
* D: Hyperactive (5 items)
* E: Peer-Conflict/ Withdrawn (3 items)

Appendix C: Socio-Demographic Characteristics of Participants

Variable	N	%	Variable	N	%
Child Age			Residence		
6	27	2.7	Rural	245	24.2
7	69	6.8	Urban	753	74.5
8	97	9.6	Missing	13	1.3
9	113	11.2			
10	150	14.8	Number of Children		
11	114	11.3	1	179	17.7
12	112	11.1	2	386	38.2
13	107	10.6	3	294	29.1
14	104	10.3	4	103	10.2
15	75	7.4	5	32	3.2
16	24	2.4	6	10	1.0
17	14	1.4	7	6	0.6
18	5	0.5	Missing	1	0.1
Gender			Father Presence		
Male	517	51.1	No	511	50.5
Female	494	48.9	Yes	500	49.5
Race			Family Income		
Hispanic	229	22.7	0	6	0.6
Black	459	45.4	1 - 9,999	212	21.0
Non-Hispanic,			10,000 - 19,999	221	21.9
Non-Black	323	31.9	20,000 - 29,999	153	15.1
			30,000 - 39,999	124	12.3
			40,000 - 49,999	51	5.0
			50,000 +	73	7.2
			Missing	171	16.9

Note: Total percentages may not add to 100 percent due to rounding.

Total Sample = 1,011

Appendix D: Maternal Characteristics

Variable	N	%	Variable	N	%
Age at 1st Birth			Education		
< 15	20	2.0	1 to 8th grade	83	8.2
15	72	7.1	9 to 11th grade	339	33.5
16	164	16.2	12th grade	424	41.9
17	215	21.3	13th grade +	163	16.1
18	246	24.3	Missing	2	0.2
19	294	29.1			
			Self-Esteem		
			20 - 25	28	2.8
			26 - 30	396	39.2
			31 - 35	322	31.7
			36 - 40	236	23.3
			Missing	29	2.9

Note: Total percentages may not add to 100 percent due to rounding.

Total Sample = 1,011

VITAE

Education

1996 **Ph. D.**, Family and Child Development

Virginia Polytechnic Institute and State University,

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Dissertation: Home Environments and Developmental

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1986 - 1987 Ph. D. courses in Family Relations and Human Development

The Ohio State University, Columbus, Ohio

1984 **M. S.**, Family Relations and Child Development

Korea University, Seoul, Korea

Thesis: A Study of Differences in Parent - Child Relationships

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1982 **B. A.**, Home Economics

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Research and Professional Experience

1993 - 1995 Research Volunteer in Analyzing Secondary Dataset

Science Center, Harvard University, Cambridge, Massachusetts

1992 Member of the International Panel

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1983 - 1984 Research Assistant, Institute of Asian Affairs

Participated in: Survey 500 mothers and interview 10 mothers for developing an instrument of Parenting Behavior Index (PBI), Korea University, Seoul, Korea

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Publication

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Academic Distinctions and Honors

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Skills

Data Analysis: Developing Instruments; Collecting, Scoring, Coding, Analyzing Data (SPSS)

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