

## Influence of Home Environment on the Social-Emotional Development of Young Children

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The effects of a responsive home environment on the social-emotional development of young children constitute the focus of this practice-based research synthesis. A responsive home environment provides young children emotional support and positive interactions with adults as well as activities and materials that stimulate and challenge children. Six characteristics of a responsive home environment assessed by the Infant-Toddler Home Observation for Measurement of the Environment (Caldwell & Bradley, 1979) are the focus of this synthesis: (1) parental emotional and verbal responsiveness, (2) parental acceptance of the child, (3) organization of the environment, (4) quantity of education materials available, (5) parental involvement, and (6) amount of daily opportunities for stimulation. Each of the six characteristics was used in 12 of the 19 studies included in this synthesis. The remaining 7 studies possessed one or more of the characteristics. In this synthesis, the effects of these characteristics focus on three dimensions of social-emotional development in young children: adaptive functioning, adaptive behavior, and temperament. Findings from the 19 studies examined in this synthesis indicate that some aspects of the home environment have a positive influence on the social-emotional development of young children. The three characteristics associated with children's social competence were (1) having parents who were physically and emotionally responsive and sensitive to the child, (2) having a variety of learning materials and toys available to the child, and (3) interacting with adults who provide encouragement to try new challenges with learning materials. Implications for practice are described in terms of the environmental components most likely to optimize social-emotional development of young children.

### Purpose

The purpose of this practice-based research synthesis is to determine the effects of a responsive home environment on the social-emotional development of children 3 years of age or younger. Specifically, the following characteristics were used to define a responsive home environment: (1) parental emotional and verbal responsiveness, (2) parental acceptance of the child, (3) organization of the environment, (4) quantity of education materials available, (5) parental involvement with the child, and (6) amount of daily opportunities for stimulation. In this synthesis, these six characteristics of the home environment are assessed by one of the most widely used scales (Shonkoff & Phillips, 2000), the Infant-Toddler Home Observation for Measurement of the Environment (IT-HOME), which was developed to measure the quality and quantity of stimulations and support available to a child in the home environment (Caldwell & Bradley, 1979).

### Operational Framework

The conduct of the synthesis is guided by a framework that focuses on the degree to which variations in the home environment are associated with variations in the social-emotional development of children (Dunst, Trivette,

& Cutspec, 2002). In general terms, a practice-based research synthesis differs from more traditional meta-analyses by systematically examining and unpacking the characteristics of practices that are related to differences in outcomes or consequences. Specifically, this type of analysis focuses more on an understanding of *how* the same or similar characteristics exert the same or similar observable effects and not solely on statistical relationships between or among these variables.

### Background

In the early 1960s a serious interest in the influence of children's home environments on cognitive and social-emotional development of very young children began to

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develop (Bloom, 1964; Hunt, 1961). Over the last four decades, the home environment has become a major focus of inquiry in the area of human development (Shonkoff & Phillips, 2000). Throughout this period, researchers have struggled with conceptual issues. These issues include, but are not limited to, issues of the bi-directionality of the relationship between the child's traits and the home environment (Bronfenbrenner, 1999; Zimmerman, 1981), whether there are critical developmental periods where the home environment is most likely to have a long-lasting influence (Lamb, 1997), and the level of complexity an environmental model needed to impact the development of young children (Wachs, 1992). Regardless of these ongoing debates, there has been widespread, though not complete, agreement concerning the value of understanding the dynamic interplay between children and their environments, as well as agreement concerning the measurement issues generated by trying to assess this interplay (Magnusson, 1995; Wachs, 1992, 2000).

Recognizing the simplicity of the following statement, it is generally felt that the higher the quality and greater the quantity of positive environmental interactions and experiences, the greater the positive impact of this environment on children's development (Bronfenbrenner, 1999; Coll & Magnusson, 1999; Harkness & Super, 1995; Magnusson, 1995; Shonkoff & Meisels, 2000; Shonkoff & Phillips, 2000). Specifically, Bradley and his colleagues (Bradley, Corwyn, Burchinal, McAdoo, & Coll, 2001) theorize that children living in different ecological niches tend to encounter specific actions, objects, and events and conditions in different amounts and patterns. This perspective suggests that environmental factors that influence the development of young children include the types and amounts of interactions, materials, and experiences young children have within their home environment.

Both previous reviews and Bradley's definition suggest characteristics of the home environment related to personal interactions, material availability, and age appropriate stimulations that should form the focus of research efforts. Though the measurement of these characteristics has been a challenge (Magnusson, 1995; Wachs, 1992, 2000), the Home Observation for Measurement of the Environment (HOME) (Caldwell & Bradley, 1979) is a popular and widely used measure of children's home environment (Shonkoff & Phillips, 2000) that measures these characteristics. It has been modified to be age appropriate for infants and toddlers (Infant-Toddler Home Observation for Measurement of the Environment, IT-HOME). The IT-HOME assesses materials, activities, and transactions that occur within the family setting and are thought to support early learning and social-emotional development.

Recently, Wachs (2000) reviewed available research to examine the extent to which home environments influence a variety of outcomes including cognitive and aca-

ademic competence, personality, and resilience. Wachs concludes that characteristics such as caregiver responsiveness, tactual kinesthetic stimulation, verbal stimulation, and a variety of age appropriate stimulation are related to the cognitive and academic competence of children. Because the importance of these home environmental characteristics on academic outcomes has been well-established (Wachs, 2000), this synthesis examines the relationship between these characteristics and social-emotional development of young children.

This research synthesis examines the relationship between interactional and environmental characteristics of the home environment that previously were found to be important to the cognitive development of young children on three dimensions of social-emotional development of young children.

#### *Description of Practices*

This synthesis examines the six major characteristics of the home environment as the practices of interest. Three of the characteristics: (a) emotional and verbal responsiveness, (b) parental acceptance of the child's behavior, and (c) parental involvement with the child all focus on the interaction between parent and child and represent an emotional component of the home environment. Emotional and verbal responsiveness is characterized by the demonstration of positive parental responses to the child's behavior, either physically or verbally, such as praising or caressing the child. Parental acceptance of the child's behavior refers to parental acceptance of less than optimal behavior by the child without resorting to restriction or undue punishment (e.g., taking a toy, scolding, spanking). Parental involvement with the child is characterized by the parents playing an active role encouraging activities that stimulate cognitive development, such as providing opportunities for the child to interact with challenging situations.

The remaining three practice characteristics: (a) organizational, physical and temporal environment, (b) learning materials, and (c) opportunities for variety in daily stimulation assess the physical aspects of the home environment. Organization of physical and temporal environment focuses on the amount of structure in the child's daily routine as well as the child's physical environment that is provided by the parent. Learning materials focus specifically on the availability of a variety of toys or materials that promote cognitive and motor development. Opportunities for variety in daily stimulation are characterized by the variety of adults engaged in a number of different activities with the child on a daily basis.

For this synthesis, the six characteristics of a responsive home environment are assessed using the Infant-Toddler Home Observation for Measurement of the Environment (IT-HOME) (Caldwell & Bradley, 1979). This is a 45-item checklist scored in a binary fashion (Yes-No). Two-thirds of the items require observation in the home and the

remainder items are assessed from parental report. According to the scale's authors, IT-HOME was designed with the following characteristics: "(1) It would assess a broad array of transactions, events, and objectives in the child's early environment that are potentially important for development; (2) it would be sensitive to such critical features of the environment as responsiveness of parents and parental warmth; (3) it would be reliable, yet easy to use; and (4) it would be feasible to use for the purpose of planning early intervention programs," (Elardo & Bradley, 1981). In order to keep the characteristics of the home environment similar and because the IT-HOME has been used extensively to assess these characteristics, this synthesis focuses on studies using this scale.

### Search Strategy

#### *Search Terms*

The following search descriptors were used in an electronic search to locate relevant studies: (a) home environments, (b) HOME (Home Observation for Measurement of the Environment), (c) Robert Bradley and/or Betty Caldwell, and (d) social and emotional development. The search was delimited by adding infants or toddlers as a Boolean condition.

#### *Sources*

The primary databases searched for relevant studies were Psychological Abstracts online (PsycINFO), Educational Resources Information Center (ERIC), and Social Sciences Citation Index (SSCI). A web-based search engine, Google, was used to search for information available through the Internet. In addition, hand searches were completed for relevant journal articles, book chapters, and books in order to locate additional studies. The reference list of each newly identified study was reviewed to determine whether it contained studies previously unidentified.

#### *Selection Criteria*

Studies included in the synthesis used the Infant-Toddler Home Observation for Measurement of the Environment (IT-HOME) to assess six characteristics of the home. Each study included in this synthesis used one or more of the subscales from the IT-HOME to assess the home environment. The assessment of the home had to be made when the child was 3 years of age or younger for the studies to be included in the synthesis. The studies in this synthesis also had to include at least one measure of the child's social-emotional development.

*Exclusion criteria.* Since the characteristics of the home environment used in this synthesis were only those measured by the IT-HOME, studies that used other versions of the HOME developed for older children (e.g., early childhood and middle school versions of the HOME) or that used only the total scale score of the IT-HOME were not included in this synthesis. Studies that used the short

form of the HOME that was developed from the National Longitudinal Study of Youth (NLSY) were also excluded for this synthesis. Though a short form of the IT-HOME was developed for use in the homes of young children, the subscales of this instrument do not have the same items as the original IT-HOME. If this version of the scale had been included, the synthesis constructs would not be similar; therefore, the synthesis would not clearly separate out the characteristics of the home environment related to social-emotional development.

Studies that assessed some or all of the six characteristics were also excluded from the reviews if the data analysis was conducted in such a way that it was impossible to discern the effects of the home environment as defined above on the social-emotional outcome. For example, Bradley and his colleagues (Bradley et al., 1994) combined four characteristics from the IT-HOME with two other variables to create a protective index and, from the analysis presented, it was not possible to determine the unique contribution of specific characteristics. Studies of this type were excluded from the synthesis.

### Search Results

Nineteen studies are included in this synthesis. Table 1 shows selected characteristics of study participants, while Table 2 presents information regarding research designs used in the studies, including the specific subscales total used in each study, information concerning the availability of reliability data taken on the IT-HOME, and social-emotional outcomes that are used in the studies.

#### *Participants*

The studies included 3,322 children who were 6 to 36 months of age when they were first assessed. In seven studies (37%), the children were included because they were born premature and/or had a low birth weight (less than 2,500 grams). Five studies (26%) included only children who were considered typically developing and three studies (16%) used children who had been diagnosed with developmental disabilities. Two studies (Erickson, Sroufe, & Egeland, 1985; Shaw & Vondra, 1995) used participants who were low-income as their sample (see Table 1). One study used twins (Matheny, Wilson, & Thoben, 1987) and Daniel and colleagues (1984) compared families who had adopted children to families raising their biological children.

Most of the study participants ( $N = 1,976$ , 59%) were born prematurely with very low birth weights (less than 2,500 grams), 579 (17%) were identified as having a disability, and 751 (23%) were children developing typically. In all of the studies, children were 3 years of age or younger at the time their parents were recruited for the studies. In all but two of the studies (Bakeman & Brown, 1980; Erickson et al., 1985), the last assessment occurred when the chil-

dren were between the ages of 12 to 36 months. The gender of the children who participated in these studies was reported in 11 of the 19 studies (58%). The percentage of males in these studies ranged from 40% to 59%.

In 13 studies (68%), the primary caregiver was identified as female, usually the biological or adoptive mother of the child. Six studies (32%) did not specify the gender of the caregiver. Nine studies (47%) specified ethnicity and 67% ( $N=6$ ) of the nine reported that less than 50% of the participants were Caucasian. Ten studies (53%) reported the percentage of caregivers who were married or living with a partner, with these percentages ranging from 28% to 100%. Education level was reported in nine studies (47%). Five studies (26%) reported the percentage of participants who had received a high school diploma. The percentage of participants who completed high school ranged from 29% to 66%. The mean parental educational level was reported in four studies (21%) as being between 11 or 12 years of education.

#### *Research Designs*

Table 2 summarizes the research designs employed by each study. Eleven studies (58%) used a longitudinal design, seven studies (37%) used a cross-sectional design, and one study did not indicate the type of design used in the study.

#### *Practice Characteristics*

Table 2 summarizes the six practice characteristics used in the synthesis as assessed by the IT-HOME. Information used to score the IT-HOME is collected through observation of the parent and child and through an interview with a parent. From this information gathering process, a binary score is given to each item. Caldwell and Bradley (Caldwell & Bradley, 2001) speculate that inter-observer reliability is often found to be high because of this binary approach to coding. In this synthesis, 7 studies (37%) reported reliability data. The reported kappas ranged from .76 to .90, representing strong agreement (Fleiss, 1981).

For this synthesis, there were six individual characteristics assessed by the IT-HOME. The characteristic most frequently assessed in this synthesis is the emotional and verbal responsiveness of parents. It was used in all of the studies included in this synthesis. Two characteristics: (1) parental acceptance of the child's behavior and (2) organization of physical and temporal environment were used in 14 studies (74%). The remaining three characteristics (i.e., learning materials, parental involvement, and opportunities for variety in daily stimulation) were used in 13 (68%) of the studies.

Twelve of the 19 studies (63%) measured all six characteristics. Three studies (16%) assessed only one characteristic and two studies (11%) assessed two characteristics. Daniels et al. (1984) assessed three characteristics, and Bradley et al., (1995) assessed four characteristics.

#### *Outcomes*

The outcome focused on in this synthesis is the social-emotional development of young children. When examining the social-emotional outcomes used in these studies, there are three dimensions of social-emotional development: adaptive functioning, adaptive behavior, and infant temperament (Bradley, 1993). The aspects that make up each of the dimensions is described in the following sections.

*Adaptive functioning.* One dimension of social-emotional development examined was adaptive functioning. This type of outcome focuses on children's sociability, including their ability to make social adjustments, participate in social situations, show consideration of others, etc. A second aspect of adaptive functioning is the expression of behavior problems. The third aspect of adaptive functioning is social adjustment in a school setting. Adaptive functioning was measured in 12 of the 19 studies (63%).

*Adaptive behavior.* The second dimension of social-emotional development was adaptive behavioral functioning, which examines the level of independence in various areas such as community living, motor, personal, and social. Adaptive behavioral functioning was measured in three studies (16%).

*Infant temperament.* The third dimension of social-emotional development was the child's temperament. This area examines various aspects of temperament including difficult temperaments, activity level, rhythmicity, and adaptability. Temperament was measured in eight studies (42%).

Just as most studies used multiple subscales to measure various aspects of the home environment, 16 studies assessed multiple dimensions of social-emotional development. The 19 studies in this synthesis measured a total of 26 different constructs of social-emotional development. Ten (39%) of these constructs focused on adaptive functioning, 5 (19%) measured adaptive behavior, and 11 (42%) of the constructs assessed temperament.

There were a total of 16 different instruments used to assess the three aspects of social-emotional development. Four scales (a) The Classroom Behavior Inventory (Bradley, 1989), (b) Scales of Independent Behavior (Bruininks, Woodcock, Weatherman, & Hill, 1985), (c) Toddler Temperament Scale (Fullard, McDevitt, & Carey, 1978), and (d) Child Behavior Checklist (Achenbach, Edelbrock, & Howell, 1987) were each used in three studies included in this synthesis.

### **Synthesis Findings**

This synthesis examined the relationship between six characteristics of the home environment as measured by IT-HOME and three dimensions of social-emotional devel-

opment (i.e., adaptive functioning, adaptive behavior, and infant temperament). This section presents the findings for the practice-based synthesis using the characteristic and consequences model (Dunst et al., 2002) described previously.

### Results

Table 3 displays the relationship between the six practice characteristics and adaptive functioning. Tables 4 and 5 display the relationship between adaptive behavior and infant temperament, respectively, and the six characteristics of a responsive home environment. The results are organized to help highlight patterns between the characteristics and individual outcome indicators (e.g., adjustment) within a larger outcome dimension (e.g., adaptive functioning). Patterns of results were highlighted (see boldfaced numbers) if two or more studies within the same outcome dimension reported a strong (.30 or higher) correlation. Each of the three tables contains the same type of information. The first column contains the bibliographic source for the study that is included in each row. The individual relationship between each characteristic and the outcome is displayed in the next six columns.

The relationship between each characteristic and each outcome is displayed in the table using the following notation. An asterisk (\*) is shown when there was no indication that the characteristics were measured in a particular study. If the characteristics were measured in the study, and a correlation was provided or could be computed, then the correlation is presented. In some studies, investigators only provided the correlations if a statistically significant relationship between the characteristics and the outcome existed. When this did not occur, an "N" is displayed to indicate that the relationship between the characteristic and the outcome measure was assessed by the investigator, but was not reported because there was no statistically significant relationship.

*Adaptive functioning.* The examination of the relationship between adaptive functioning indicators and the six characteristics (see boldfaced numbers in Table 3) reveals two particularly interesting patterns in the data. Patterns were determined by examination of the strength of the correlations (.30 or greater) that occurred within the same dimension across two or more studies. First, the emotional and verbal responsiveness of parents appears to be related to positive social functioning (e.g., social competence, soothability, pleasure with contact). Second, the availability of learning materials also appears to be related to the same group of positive social functioning indicators. The more parents provide learning materials and respond to their children in a positive manner, both verbally and emotionally, the more likely young children display social competence. These findings were present in two longitudinal studies and one cross-sectional study. These findings suggest that when parents are verbally

and physically responsive to their children and provide them with many opportunities to explore, children have more confidence and are more comfortable in social situations.

In Table 3, there also appears to be a relationship between three of the characteristics (learning materials, parental involvement with child, and opportunities for a variety of daily stimulation) and the dimension of social adjustment. For each of these characteristics, the relationship is positive, suggesting that when there are more learning materials available, a higher degree of parental involvement, and a greater variety of opportunities for children to interact with others, then there is a greater likelihood of social adjustment. The findings were seen in two longitudinal studies (Bradley, Caldwell, & Rock, 1988; Bradley, Caldwell, Rock, & Harris, 1986) that assessed the home environment when the children were six months of age and assessed social adjustment at 24 and 36 months of age.

*Adaptive behavior.* Table 4 presents the relationship between the six characteristics and adaptive behaviors. Two unique features of this group of studies are that all of them focus on children with disabilities and that the same outcome measure, Scales of Independent Behavior (SIB), is used in all of these studies. This table (see boldfaced numbers) suggests one relationship between acceptance and each dimension (i.e., community living, motor, personal, social, and a total score of independent subscales) measured on the SIB. Interestingly, the relationship is in a negative direction, suggesting that for children with disabilities the higher the levels of parental acceptance of the child's behavior, the less likely the children display independent behavior in a variety of areas. This finding may suggest that if parents just accept the behavior of their children with disabilities and do not encourage more adaptive behaviors, then the children are less likely to progress. Caution should be taken in interpreting this finding because parents of children with disabilities may have altered expectations for their children particularly in the area of independence, varying as a function of the child's type or level of disability (Fewell & Vadasy, 1986). In both of the studies cited in this area, the children had either significant developmental disabilities or orthopedic disabilities, both of which have challenges regarding independence. However, from the information available in this synthesis, it is not possible to disentangle the relationship between acceptance of a child's behavior and less independence in the area of adaptive behavior.

*Infant temperament.* Table 5 presents the relationship between the six characteristics and infant temperament. In these studies, six different measures were used to assess infant temperament. Though there were some relationships, there was only one clear pattern between the 11 dimensions of infant temperament and any of the six practice characteristics. The only pattern (see boldfaced numbers)

is a negative relationship between the provision of learning materials and the child's mood. The pattern shows when there is a decrease in the availability of learning materials, there is an increase in the child's moody, fussy behaviors. Neither of the two studies with this relationship were longitudinal so with only cross-sectional correlational data it is not possible to establish the causal direction of the relationship. It should be noted that in the temperament studies, there are a large number of correlations not reported because they were not statistically significant, making the identification of other possible patterns difficult.

#### *Rival Explanations*

Possible threats to internal validity (Campbell & Stanley, 1963; Cook & Campbell, 1979) and rival explanations (Yin, 2000) for the observed effects need to be discussed. Issues of instrumentation must be considered in a synthesis such as this one where the same independent measure is used across studies. However, the findings of the synthesis would suggest that instrumentation concerns regarding the independent measure are not the sole explanation for the findings. If instrumentation was the explanation for the findings, then one would expect there to be a large number of significant findings among the outcome dimensions. However, there are not a large number of relationships identified, suggesting that the scale does discriminate in assessing various characteristics of the home environment. Furthermore in Table 3, both the emotional and verbal responsiveness of parents and the availability of learning materials are related across various studies, using various outcome measures reducing the possibility of rival hypotheses such as testing effects.

In examining the relationship between the acceptance characteristic and the adaptive behavior measures, another rival hypothesis needs to be considered. The three studies reported in Table 4 provide very minimal information about the study participants, including only early age of assessment and child diagnosis. A possible alternative hypothesis is that some other variable, such as the severity of the child's disability, is really having the effect as opposed to the level of acceptance of the child behavior by the parent.

#### **Conclusion**

The focus of this synthesis is on the relationship between six characteristics of a responsive home environment and the social-emotional development of young children. Two constructs (i.e., social competence and social adjustment to new social environments), which were dimensions of the adaptive functioning outcome, were positively associated with various characteristics of the home environment. The three characteristics associated with children's social competence in different environments were (1) having parents who were physically and emotionally

responsive and sensitive to the child, (2) having a variety of learning materials and toys available to the child, and (3) interacting with adults who provide encouragement to try new challenges with learning materials. Parents being sensitive and responsive during interactions and allowing their children to interact with various adults in a variety of situations is important in the social-emotional development of young children. Having a variety of learning materials and toys that are designed to challenge, parents who play an active role in encouraging the child's exploration in challenging situations, and having a variety of adults engaged in a variety of activities daily were all associated with the child's social adjustment to new situations.

Although this synthesis did not find a large number of relationships between the characteristics of the home environment (as measured by the IT-HOME) and social-emotional development, one must be very careful about making conclusions that the home environments in which young children are raised have only limited impact on their social-emotional development. The limited number of findings may be due to the complexity of the home environment and the difficulty of any one assessment strategy being able to assess all features in the home environment (Wachs, 1999). Regardless, the contention that the home environment is important in the social-emotional development of young children is supported by the findings from the studies that are included in this synthesis when the social-emotional constructs are social competence and social adjustment.

#### *Implications for Practice*

The findings from this research synthesis have two major implications for practice. The first concerns the role of the parent in providing a certain type of physical home environment for children. The research evidence suggests the importance of providing children with an environment that contains a variety of learning materials and toys that are designed to challenge children and with an environment that contains a variety of different experiences and activities that occur with some regularity. The second implication of this practice concerns the emotional and physical responsiveness and sensitivity of the parent to the child, and the parents' encouragement of the child to explore environments that are presented to the child.

How can this synthesis be used to inform practice? Armed with knowledge about the important aspects of the home environment and its positive impact on social-emotional consequences, one can make an assessment of experiences children have at home and maximize the number of responsive, sensitive, and challenging interactions children have with both adults and materials in the home. Parents and practitioners will be able to look at the child's environment and home routines to determine ways to promote healthy social-emotional development.

To assist practitioners in implementing this practice, a

*Bottomlines* (Vol. 2, No. 2) report that describes the major findings from this practice-based research synthesis in nontechnical, user-friendly language has been developed. The *Bottomlines* summarizes what we know about the characteristics of the home environment specifically for parents and practitioners. Also included is a lively vignette illustrating what the practice looks like for young children and their parents.

Both the *Bridges* and *Bottomlines* reports are being used to produce practice guides that take a user step-by-step through the process of developing these important characteristics of the home environment. These guides will be available to readers in either electronic versions at our website ([www.researchtoppractice.info](http://www.researchtoppractice.info)) or written versions that can be obtained by writing us at our Research and Training Center address. RTC product development specialists develop practice guides when research evidence supports the use of a particular practice.

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Table 1  
*Characteristics of the Study Participants*

	Child Characteristics				Caregiver Characteristics			
	Sample Size	Sample Type	Age at Assessment (Months)	Percent Male	Percentages			Education
					Female	Caucasian	Married <sup>a</sup>	
Affleck et al. (1982)	43	Very low birth weight, major medical complication	8-9	53	100	NA	79	12 <sup>b</sup>
Bakeman & Brown (1980)	56	Preterm, fullterm	20, 38	NA	100	0	28	11 <sup>b</sup>
Berlin et al. (1995)	547	Low birth weight	36	48	100	42	50	29 <sup>c</sup>
Bradley (1989)	280	Children with disabilities	NA	NA	NA	NA	NA	NA
Bradley & Caldwell (1981)	72	Typically developing	12	NA	NA	NA	NA	NA
Bradley et al. (1986)	174	Typically developing	6, 24, 32	51	100	34	70	12 <sup>b</sup>
Bradley et al. (1988)	42	Typically developing	6, 24	56	100	27	NA	NA
Bradley et al. (1989)	99	Significant disabilities = 55 Comparison group = 44	6-36	NA	NA	NA	NA	NA
Bradley et al. (1995)	465	Low birth weight	12, 36	50	100	36	50	66 <sup>c</sup>
Daniels et al. (1984)	272	Adopted, non-adopted	12, 24	NA	NA	100	NA	NA
Erickson et al. (1985)	96	Low income, low education	24, 30, 54-60	59	100	80	38	59 <sup>c</sup>
Holder-Brown et al. (1993)	20	Orthopedic disabilities	6-36	NA	NA	NA	NA	NA
Houldin et al. (1989)	40	Typically developing	12-36	40	100	NA	100	NA
Matheny et al. (1987)	112	Twins	7, 12, 18, 24	43	100	NA	NA	NA
Medoff-Cooper & Schraeder (1981)	26	Very low birth weight	10	50	NA	NA	NA	NA
Schraeder & Medoff-Cooper (1983)	20	Very low birth weight	12, 24	45	100	NA	NA	NA
Shaw & Vondra (1995)	100	Low income	12, 15, 24, 36	59	100	61	47	12 <sup>b</sup>
Stevenson & Lamb (1979)	40	Typically developing	12	48	100	NA	100	50 <sup>c</sup>
Sugland et al. (1995)	819	Low birth weight/ premature infants	36	NA	100	37	52	60 <sup>c</sup>
	Total: 3,323	7 = Premature/low birth weight 5 = Typically developing 3 = Developmental disabilities	Mean age at first assessment 13.7 months	Mean percentage of males 50%	Mean percentage of female caregivers 100%	Mean percentage of Caucasians 46%	Mean percentage of respondents married 61%	Mean percentage who completed high school 54%

<sup>a</sup>Married or living with partner

<sup>b</sup>Mean educational level (years)

<sup>c</sup>Percentage who completed high school

Table 2  
*Characteristics of Research Design*

Study	Research Design	Reliability <sup>a</sup>	Practice Characteristics <sup>b</sup>						Outcomes	
			1	2	3	4	5	6	Type <sup>c</sup>	Specific Measures <sup>d</sup>
Affleck et al. (1982)	Cross sectional	Y	Y <sup>e</sup>	Y	Y	Y	Y	Y	AF IT	<sup>1</sup> Pleasure in contact, soothability <sup>2</sup> Rhythmicity, activity level
Bakeman & Brown (1980)	Longitudinal	N	Y	N	N	N	N	N	AF	<sup>16</sup> Social competence, social participation
Berlin et al. (1995)	Cross sectional	Y	Y	N	N	N	N	N	AF	<sup>3</sup> Total behavior problems
Bradley (1989)	NA	N	Y	N	N	N	N	N	AF AB	<sup>4</sup> Task orientation, consideration, adjustment <sup>5</sup> Social, personal, total independence
Bradley & Caldwell (1981)	Cross sectional	N	Y	Y	Y	Y	Y	Y	AF	<sup>11</sup> Positive orientation, fear & resilience, enthusiasm & alertness, activity level, self absorption
Bradley et al. (1986)	Longitudinal	N	Y	Y	Y	Y	Y	Y	AF	<sup>4</sup> School adjustment
Bradley et al. (1988)	Longitudinal	Y	Y	Y	Y	Y	Y	Y	AF	<sup>4</sup> Extraversion, task orientation, consideration, adjustment
Bradley et al. (1989)	Cross sectional	N	Y	Y	Y	Y	Y	Y	AB	<sup>5</sup> Motor, social, personal, community living, total independence
Bradley et al. (1995)	Longitudinal	Y	Y	Y	N	Y	N	Y	AF	<sup>12</sup> Social competence
Daniels et al. (1984)	Longitudinal	N	Y	Y	Y	N	N	N	IT	<sup>6</sup> Difficult temperament
Erickson et al. (1985)	Longitudinal	N	Y	Y	Y	Y	Y	Y	AF IT	<sup>14, 15</sup> Compliance with teacher requests <sup>9</sup> Anxious attachment
Holder-Brown et al. (1993)	Longitudinal	N	Y	Y	Y	Y	Y	Y	AB	<sup>5</sup> Motor, social, personal, community living, total independence
Houldin et al. (1989)	Cross sectional	N	Y	Y	Y	Y	Y	Y	IT	<sup>7</sup> Rhythmicity, activity, approach, mood, intensity, persistence, distractibility
Matheny et al. (1987)	Longitudinal	Y	Y	Y	Y	Y	Y	Y	IT	<sup>7</sup> Tractability— 1st factor: mood adaptability, approach, attention
Medoff-Cooper & Schraeder (1981)	Longitudinal	N	Y	Y	Y	Y	Y	Y	IT	<sup>13</sup> Activity, rhythmicity, distractibility, approach, adaptability, persistence, threshold, intensity, mood
Schraeder & Medoff-Cooper (1983)	Cross sectional	N	Y	Y	Y	Y	Y	Y	IT	<sup>7</sup> Activity level, rhythmicity, distractibility, approach, adaptability, persistence, threshold, intensity, mood
Shaw & Vondra (1995)	Longitudinal	N	Y	N	N	N	Y	N	IT AF	<sup>8</sup> Difficult temperament <sup>9</sup> Insecure attachment <sup>3</sup> Externalizing

Table 2, continued

Study	Research Design	Reliability <sup>a</sup>	Practice Characteristics <sup>b</sup>						Outcomes	
			1	2	3	4	5	6	Type <sup>c</sup>	Specific Measures <sup>d</sup>
Stevenson & Lamb (1979)	Cross sectional	Y	Y <sup>e</sup>	Y	Y	Y	Y	Y	AF	<sup>10</sup> Social with strangers <sup>11</sup> Sociable during testing
Sugland et al. (1995)	Longitudinal	Y	Y	N	Y	N	N	N	AF	<sup>3</sup> Total behavior problems
Total	58% Longitudinal studies	7	19	14	14	13	13	13	12 = AF 3 = AB 8 = IT	

<sup>a</sup>Y = Reliability data was available on the maternal responsiveness observations, N = Reliability data was not available on the maternal responsiveness observations.

<sup>b</sup>1 = Emotional and verbal responsiveness, 2 = Acceptance, 3 = Organization of the physical and temporal environment, 4 = Learning materials, 5 = Parental involvement with child, 6 = Opportunities for variety in daily stimulation, Total = Total scale score

<sup>c</sup> Social-emotional dimensions: AF = Adaptive functioning, IT = Infant temperament, AB = Adaptive behavior

<sup>d</sup>1 = Rating Scales of Maternal and Infant Characteristics (Yarrow, Cain, Pedersen, Rand, Fivel, & Abramson, 1976); 2 = Infant Temperament (Pedersen, Zaslow, Cain, & Anderson, 1979); 3 = Child Behavior Checklist (Achenbach, Edelbrock, & Howell, 1987); 4 = Classroom Behavior Inventory (Bradley, 1989); 5 = Scales of Independent Behavior (Bruininks, Woodcock, Weatherman, & Hill, 1985); 6 = Adapted from NYLS conceptualization (Thomas & Chess, 1977); 7 = Toddler Temperament Scale (Fullard, McDevitt, & Carey, 1984); 8 = Infant Characteristics Questioner (Bates, Freeland, & Lounsbury, 1979); 9 = Strange Situation (Ainsworth & Wittig, 1969); 10 = Investigator created observation item(s); 11 = Bayley's Infant Behavior Record (Bayley, 1969); 12 = Adaptive Social Behavior Instrument (Hogan, Scott, & Bauer, 1992); 13 = Infant Temperament Questionnaire (Carey & McDevitt, 1978); 14 = Preschool Behavior Questionnaire (Behar & Springfield, 1974); 15 = Behavior Problem Scale (Erickson & Egeland, 1981); 16 = Investigator created tool

<sup>e</sup>Y = Subscale score was used, N = Subscale score was not used in the study.

Table 3  
*Relationship between Practice Characteristics and Adaptive Functioning Measures*

Study	Practice Characteristics <sup>a</sup>						Outcomes
	1	2	3	4	5	6	Specific Dimensions
Berlin et al. (1995)	.10 <sup>b</sup>	*	*	*	*	*	Total behavior problems (African American)
Berlin et al. (1995)	-.47	*	*	*	*	*	Total behavior problems (Caucasian)
Shaw & Vondra (1995)	.02	*	*	*	-.21	*	Externalizing (female)
Shaw & Vondra (1995)	-.13	*	*	*	-.24	*	Externalizing (male)
Sugland et al. (1995)	.33	*	.43	*	*	*	Total behavior problems (Hispanic)
Sugland et al. (1995)	-.22	*	-.24	*	*	*	Total behavior problems (African American)
Sugland et al. (1995)	.26	*	.30	*	*	*	Total behavior problems (European American)
Bradley (1989)	.25	*	*	*	*	*	Task orientation
Bradley et al. (1988)	.01	-.09	.28	.14	.26	.35	Task orientation - 24m
Bradley et al. (1988)	.25	.29	.00	.06	.13	.21	Task orientation - 6m
Bradley (1989)	.38	*	*	*	*	*	Consideration
Bradley et al. (1988)	.19	-.14	.33	.19	.28	.39	Consideration - 24m
Bradley et al. (1988)	.38	.35	.02	.22	.12	.32	Consideration - 6m
Bradley (1989)	.17	*	*	*	*	*	Adjustment
Bradley et al. (1988)	.23	.10	.39	<b>.32</b>	<b>.22</b>	<b>.36</b>	Adjustment - 24m
Bradley et al. (1988)	.17	.24	.06	<b>.29</b>	<b>.31</b>	<b>.24</b>	Adjustment
Bradley et al. (1986)	.26	.25	.13	<b>.31</b>	<b>.35</b>	<b>.32</b>	Adjustment - 36m
Bradley et al. (1988)	.11	.08	.15	.01	-.13	N	Extraversion - 24m
Bradley et al. (1988)	-.02	.10	-.13	-.17	.11	-.19	Extraversion - 6m
Affleck et al. (1982)	<b>.43</b>	N	.31	<b>.45</b>	.31	N	Pleasure in contact
Affleck et al. (1982)	<b>.36</b>	N	N	<b>.47</b>	N	N	Soothability
Bakeman & Brown (1980)	<b>.48</b>	*	*	*	*	*	Social competence
Bradley et al. (1995)	<b>.27</b>	.24	*	<b>.38</b>	*	.42	Social competence
Bradley & Caldwell (1981)	.36	.22	.42	.64	.44	.26	Positive orientation (female)
Bradley & Caldwell (1981)	.31	-.17	.35	.34	.22	.05	Positive orientation (male)
Bradley & Caldwell (1981)	-.22	-.08	-.24	-.10	-.32	-.16	Fear (female)
Bradley & Caldwell (1981)	.05	.00	.06	.03	-.15	.21	Fear (male)
Bradley & Caldwell (1981)	.25	.10	.24	.41	.41	.28	Enthusiasm & alertness (female)
Bradley & Caldwell (1981)	-.03	-.12	.28	.17	.02	.04	Enthusiasm & alertness (male)
Bradley & Caldwell (1981)	.47	.15	.39	.69	.58	.29	Activity level (female)
Bradley & Caldwell (1981)	.26	.13	.28	.30	.27	.23	Activity level (male)
Bradley & Caldwell (1981)	-.05	.02	-.04	.06	-.06	-.15	Self absorption (female)
Bradley & Caldwell (1981)	-.08	.35	.01	-.11	.17	.02	Self absorption (male)

<sup>a</sup>1 = Emotional and verbal responsiveness, 2 = Acceptance, 3 = Organization of the physical and temporal environment, 4 = Learning materials, 5 = Parental involvement with child, 6 = Opportunities for variety in daily stimulation, Total = Total scale score

<sup>b</sup>Correlation coefficients

\*No report of the characteristic being measured in this study.

N = No statistically significant relationship reported between the subscale and the outcome measure.

Table 4  
*Relationship between Practice Characteristics and Adaptive Behavior Measures*

Study	Practice Characteristics <sup>a</sup>						Outcomes
	1	2	3	4	5	6	Specific Dimensions
Bradley et al. (1989)	-.11 <sup>b</sup>	<b>-.26</b>	-.06	-.08	-.10	-.02	Community living
Holder-Brown et al. (1993)	-.23	<b>-.63</b>	-.24	-.21	-.17	.14	Community living
Bradley et al. (1989)	.08	<b>-.35</b>	-.03	.17	.02	.13	Motor
Holder-Brown et al. (1993)	-.35	<b>-.62</b>	-.29	-.16	-.32	-.08	Motor
Bradley (1989)	-.02	*	*	*	*	*	Personal
Bradley et al. (1989)	-.02	<b>-.37</b>	-.03	.07	-.05	.10	Personal
Holder-Brown et al. (1993)	-.39	<b>-.67</b>	-.16	-.30	-.25	-.06	Personal
Bradley (1989)	.18	*	*	*	*	*	Social
Bradley et al. (1989)	.18	<b>-.20</b>	.01	.26	.12	.16	Social
Holder-Brown et al. (1993)	.08	<b>-.39</b>	.01	.16	.09	.35	Social
Bradley (1989)	.05	*	*	*	*	*	Total independence
Bradley et al. (1989)	.05	<b>-.37</b>	-.04	.14	.00	.12	Total independence
Holder-Brown et al. (1993)	-.25	<b>-.62</b>	-.19	.12	-.19	.08	Total independence

<sup>a</sup>1 = Emotional and verbal responsiveness, 2 = Acceptance, 3 = Organization of the physical and temporal environment, 4 = Learning materials, 5 = Parental involvement with child, 6 = Opportunities for variety in daily stimulation, Total = Total scale score

<sup>b</sup>Correlation coefficients

\*No report of the characteristic being measured in this study.

Table 5  
*Relationship between Practice Characteristics and Infant Temperament*

Study	Practice Characteristics <sup>a</sup>						Outcomes
	1	2	3	4	5	6	Specific Dimensions
Affleck et al. (1982)	N	.38 <sup>b</sup>	N	N	N	N	Rhythmicity
Houldin et al. (1989)	N	-.31	-.30	N	-.30	N	Rhythmicity
Medoff-Cooper & Schraeder (1981)	.21	.27	.04	.13	.17	.09	Rhythmicity
Houldin et al. (1989)	N	N	N	N	-.34	N	Activity level
Affleck et al. (1982)	.44	N	.27	.49	.49	.44	Activity level
Medoff-Cooper & Schraeder (1981)	-.04	-.04	.11	-.09	-.11	.22	Activity level
Schraeder & Medoff-Cooper (1983)	N	N	N	-.44	-.45	N	Activity level
Houldin et al. (1989)	N	N	N	N	-.35	-.39	Adaptability
Medoff-Cooper & Schraeder (1981)	-.30	-.17	.12	-.06	-.09	-.08	Adaptability
Houldin et al. (1989)	N	N	N	-.36	N	N	Approach
Medoff-Cooper & Schraeder (1981)	.17	-.23	.30	.33	.29	.24	Approach
Houldin et al. (1989)	.30	N	N	<b>-.36</b>	N	N	Mood
Medoff-Cooper & Schraeder (1981)	-.56	-.02	.05	<b>-.58</b>	-.59	-.24	Mood
Houldin et al. (1989)	N	N	N	-.36	N	N	Intensity
Medoff-Cooper & Schraeder (1981)	.11	-.20	.12	.22	.13	.43	Intensity
Houldin et al. (1989)	.33	N	N	-.27	N	N	Persistence
Medoff-Cooper & Schraeder (1981)	.03	-.08	.00	.29	.20	.32	Persistence
Medoff-Cooper & Schraeder (1981)	-.40	-.17	-.28	-.55	-.49	-.56	Distractibility
Medoff-Cooper & Schraeder (1981)	-.33	.11	-.09	-.20	-.06	.04	Threshold
Matheny et al. (1987)	-.13	-.08	.05	.03	-.03	.09	12 Month tractability
Matheny et al. (1987)	.00	-.10	-.01	.16	.02	.14	18 Month tractability
Matheny et al. (1987)	-.11	-.15	-.05	.10	.08	-.08	24 Month tractability
Daniels et al. (1984)	-.08	-.06	.09	*	*	*	Difficult temperament
Shaw & Vondra (1995)	-.09	*	*	*	-.14	*	Difficult temperament (female)
Shaw & Vondra (1995)	-.07	*	*	*	-.29	*	Difficult temperament (male)
Erickson et al. (1985)	.19	.13	.13	.37	.47	.12	Anxiously attached (without behavior problems)
Erickson et al. (1985)	.04	.01	.23	.41	.34	.07	Securely attached (without behavior problems)
Shaw & Vondra (1995)	.01	*	*	*	-.16	*	Insecure attachment (female)
Shaw & Vondra (1995)	-.20	*	*	*	-.23	*	Insecure attachment (male)

<sup>a</sup>1 = Emotional and verbal responsiveness, 2 = Acceptance, 3 = Organization of the physical and temporal environment, 4 = Learning materials, 5 = Parental involvement with child, 6 = Opportunities for variety in daily stimulation, Total = Total scale score

<sup>b</sup>Correlation coefficients

\*No report of the characteristic being measured in this study.

N = No statistically significant relationship reported between the subscale and the outcome measure.