

# FAMILY FACTORS IN CHILD CARE RESEARCH

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*The purpose of this article is to review evidence concerning the joint impact of family characteristics and child care experiences in understanding children's development. Although child care experiences are related to children's development across a variety of domains, family characteristics, particularly socioeconomic status and parenting quality, are typically stronger predictors of children's outcomes. An important implication of these findings is that high-quality child care experiences are likely to have stronger effects on children who are at risk of poorer outcomes because of less optimal family environments; evidence from experimental and nonexperimental studies generally supports this conclusion. From a policy perspective, an important goal for future research is to identify subgroups of families within the heterogeneous low-income population that are in particular need of relatively more intensive services and to develop effective interventions that are tailored to their needs.*

**Keywords:** *parenting; socioeconomic status; child care*

It is widely accepted that childhood socialization takes place in at least three major contexts: families; out-of-home settings, such as child care centers or schools; and peer groups (Collins et al. 2000). At young ages, family and child care settings are particularly important contexts for development. Considerable research has focused on the relative and independent impact of each context on children's development. This interest has arisen from many quarters, including

- a concern that placement of young children in child care might impair the development of family relationships and thus interfere with processes central to those children's healthy emotional and social development;
- a concern that low-cost, poor-quality child care might impair the healthy emotional, social, and intellectual development of young children; and
- practical concerns at a policy level about how to provide child care that is not harmful to children and is maximally beneficial at the lowest possible cost.

The article by Duncan and Gibson-Davis (2006 [this volume]) discusses the issue of selection bias in child care research and includes a consideration of the relationships between children's family and child care experiences; it also focuses on understanding how family selection factors can bias estimates of child care effects. The present article concentrates on the influence of family characteristics and experiences on individual differences in children's development and considers how the impact of child care experiences may vary depending on children's experiences in the family. It begins with a review of theory and research on the relationships between parenting and children's development together with a discussion of other family factors that are likely to be important to children's development. It next considers the research linking family and child care experiences to children's development and concludes (with some qualifications) that family experiences are typically a much stronger predictor of children's developmental outcomes than is child care. One implication of that conclusion, and a consistent theme in child care research, is that high-quality child care experiences are likely to be particularly important for young children who are at risk for poor outcomes because of unfavorable family environments. The final section of the article considers this issue.

## PARENTING AND CHILDREN'S DEVELOPMENT

Although many dimensions of families are potentially important to children's development, this article focuses primarily on parenting influences. Evidence indicates that family and parent characteristics (e.g., socioeconomic status [SES] and parental mental health) affect children at least in part through their effects on parenting behavior. Other family characteristics, however, particularly parental education and family income, also play a role in children's outcomes.

*Parent/child interactions.* Infancy and the preschool years are characterized by phenomenal growth in children's capacities for language and communication, self-regulation, and internalization of standards for behavior, all of which are important developmental tasks of early childhood. Much of children's experience relevant to their development in those arenas occurs in the context of the parent-child relationship. Attachment theory (Ainsworth, Bell, and Stayton 1974; Bowlby 1969/1982) and a number of complementary theoretical views (e.g., Erikson 1959, 1963; Mahler, Pine, and Bergman 1975; Sander 1975) emphasize the importance of the parent-child relationship in the development of these qualities in the child. Parents' early sensitive responses to the

child's signals are considered key to the development of self-regulation; their acceptance of the child's explorations and continued availability for closeness and reassurance promote flexible self-regulation in the child. Sroufe (1995) asserted that the young child's confidence in the parent-child relationship becomes self-confidence; security within the attachment relationship becomes self-reliance. Children who have experienced chaotic and inconsistent parenting have neither positive regulatory experiences to guide their own efforts nor the confidence in the caregiver (and, consequently, in themselves) required for flexible experimentation with regulation.

A large body of correlational research with young children and their parents tends to support those theories. Children whose interactions with their parents have been characterized by sensitive, responsive care (as opposed to overstimulating, dysregulating care) in the early years are better able to handle frustration, are less hyperactive, show better attention during the preschool years, and do better academically and emotionally in the early elementary years (Carlson, Jacobvitz, and Sroufe 1995; Egeland, Pianta, and O'Brien 1993; Jacobvitz and Sroufe 1987). In toddlerhood, cooperation and compliance with parents is associated with parent interaction behaviors that are well coordinated with the child's. Such parental behaviors scaffold the child's efforts, fit with what the child is doing, and add to the child's activity (Edwards 1995; Westerman 1990). In the National Institute of Child Health and Human Development (NICHD) Study of Early Child Care, an ongoing longitudinal study of more than 1,200 children in 10 geographic regions across the country, maternal sensitivity to the child's signals is a consistent predictor of positive outcomes for the child in cognitive and social development (National Institute of Child Health and Human Development Early Child Care Research Network [hereafter, NICHD], 1997a, 1998a, 1999b, 2000). Additionally, children with a history of secure attachment relationships with their parents and responsive parental care show greater self-reliance in the classroom, better ability to delay gratification, less inclination to fall apart under stress, greater curiosity and willingness to make a strong effort in the face of challenge, and greater flexibility and complexity in their play (Rosenberg 1984; Sroufe et al. 1985). Children with secure attachments also have peer relationships characterized by greater commitment, emotional closeness, and positive affect; in addition, they are more empathic and prosocial with other children but are assertive with aggressive partners (Kestenbaum, Farber, and Sroufe 1989; Pancake 1988; Sroufe 1983; Troy and Sroufe 1987).

Establishing causal relations between parenting behavior and children's outcomes is difficult, of course, because children are not randomly assigned to families. Nearly all research linking parental behavior and children's development is correlational in nature. Among other things, this makes it

difficult to establish the direction of effects when associations between parenting and children's behavior are found. It is possible, for example, that individual differences in children's behavior drive differences in observed parenting as well as differences in children's developmental outcomes, a point that has been made by behavior geneticists, among others (e.g., Rowe 2002). Behavior geneticists have also criticized socialization researchers for failing to take into account the possibility that associations between parenting and child outcomes could be due to shared genetic factors that influence both parenting and child behavior (e.g., Rowe 2002).

*Genetic influences.* Without question, genetic influences are important in understanding individual differences in children's development; it is also true that socialization research has traditionally neglected those influences, although recent research is increasingly likely to consider them (Maccoby 2002). At the same time, traditional behavior genetics approaches are based on an additive model in which genes and environment make independent contributions to variability in a given child outcome. Evidence clearly indicates, however, that genes and environment are correlated. For example, children who are more closely related genetically also experience more similar parenting than do children who are less similar genetically (e.g., identical versus fraternal twins; biological versus adoptive siblings), an association that is influenced by parents' and children's genes (Collins et al. 2000; Rowe 2002). This correlation between children's genes and the parenting they experience means that relations between parenting and child outcomes cannot be attributed solely to genetic or environmental influences (Collins et al. 2000). Similarly, additive models fail to take into account the possible influences of gene-environment interactions on child development. Current developmental theories, as well as empirical evidence, point to such interactions as critical to understanding individual differences in development (e.g., Collins et al. 2000; Gottlieb, Wahlsten, and Lickliter 1998).

One implication of gene-environment interactions is that the "effects" of particular kinds of parenting are likely to be different for children with different genotypes (e.g., different temperaments); some empirical evidence is consistent with that perspective (see Rothbart and Bates 1998). An extended discussion of this issue is beyond the scope of this article. The point is simply that although past research on socialization has neglected the role of genetic factors, it does not follow, as some researchers have suggested, that the associations between parenting and child behavior can be attributed mainly to shared genes (Maccoby 2002). The interplay between genes and environmental factors is much more complex than previously believed, and the task for future research is to understand better how genetic

and environmental factors (including extrafamilial factors) work together to influence development.

*Exploring causation.* In the absence of experimental designs, socialization researchers have adopted different strategies to address the issue of child effects and to permit stronger inferences about parenting influences (Collins et al. 2000). In longitudinal studies, one approach is to measure both parent and child behavior at one point in time and then examine the association between parenting and child behavior at a later point in time, controlling for initial child behavior. Although this strategy cannot establish a causal relation between parenting and child behavior, it provides evidence that the association between the two is not solely a function of child characteristics. Studies that have used this approach have obtained effect sizes for parenting in the modest to moderate range (Collins et al. 2000), although they focus mainly on older children and adolescents rather than on young children.<sup>1</sup>

Experimental designs provide the strongest evidence about the effects of parenting because random assignment equates the treatment and control groups on all characteristics except the experimental intervention. Most experimental parenting interventions, particularly those for young children, are designed to prevent problematic outcomes in children at risk because of environmental factors (e.g., poverty) and may include components focused directly on children as well as parents (Maccoby 2002; Magnuson and Duncan 2002). Findings across studies indicate modest effects of such interventions on the quality of parenting; intensive, expensive, small-scale programs are more likely than less intensive, large-scale programs to produce significant effects (Magnuson and Duncan 2002). The most convincing evidence on causal associations between parenting and child outcomes is from randomized experimental interventions that are directed solely at parents, that assess the effects of the intervention on parenting behavior, and that analyze how changes in parenting are related to child outcomes (Collins et al. 2000). Few intervention studies meet all of those criteria; those that do, however, indicate that parenting is causally related to children's outcomes. For example, a study by van den Boom (1994) examined the effects of a home-visiting intervention designed for low-income parents with highly irritable infants. The intervention significantly increased maternal sensitivity and responsiveness. At 12 months, 62% of infants in the intervention group were securely attached, compared with 22% of infants in the control group. In another study, Cowan and Cowan (2002) evaluated the effectiveness of two different 16-week interventions in which parents of 4-year-old children met weekly in small groups with trained professionals to discuss topics that

included their marital relationships and their relationships with their children. One intervention emphasized parenting, whereas the other placed greater emphasis on marital issues. The study was also somewhat unusual in that participants were middle-class families without identified risk factors. Relative to the control group, parents participating in either intervention showed positive changes in parenting behavior, and their children's academic and socio-emotional outcomes in kindergarten and first grade were more positive than those of children in the control group; effects were modest to moderate.

In summary, a large body of correlational research indicates relations between parenting and children's adjustment across a variety of domains. Experimental parenting interventions are relatively few in number, but they suggest that parenting plays a causal role in children's development. In general, the magnitude of parenting effects is now believed to be more modest than earlier research suggested, with increasing evidence that relations between parenting and children's outcomes are moderated by other factors, including child characteristics and contextual influences (Collins et al. 2000).

### **FAMILY CHARACTERISTICS, PARENTING, AND CHILD DEVELOPMENT**

Family characteristics other than parenting are also potentially important influences on children's development. They include demographic factors, such as income and education, as well as psychosocial factors, such as parental mental health and the quality of social support, including spousal support. These factors are correlated with the quality of care that parents provide. For example, financial and emotional stresses negatively affect the well-being of parents and adversely affect their attentiveness and sensitivity to their children (Crnic and Acevedo 1995; McLoyd 1990, 1998a). Mothers' education and income is positively correlated to sensitivity to the signals of their young children and to the positive engagement of their young children with them (NICHD 1999a).

Social support networks are also important. Parents' perceptions of supportive networks beyond the family are associated with sensitive and responsive parenting and positive child development (Cochran and Niego 1995). Well-supported mothers are less restrictive and punitive with their infants than are mothers without good social support, and improvements in social support are associated with improvements in parent-child relationships (Bornstein 1995; Crnic et al. 1983). In contrast, high levels of marital conflict are inversely related to sensitive parenting and to optimal outcomes in children (Demo and Cox 2000).

Parental personality and functioning also predict the quality of parent-child relationships (Belsky 1984; Cox et al. 1989; Lamb and Easterbrooks 1981). Maternal depression has perhaps been studied more than other parental characteristics. Field (1984) found that the interactions between depressed mothers and their infants were characterized by less positive and more negative affect, less infant vocalization, and more passivity on the part of the infant. In a recent study (NICHD 1999b), mothers with high and chronic depressive symptoms were less likely than other mothers to be sensitive to their infants, but only when they also had low incomes. In general, levels of parental psychopathology are related to qualities of the parent-child relationship and the child's adjustment (Dodge 1990; Hauser and Bowlds 1990; Rutter 1990).

Evidence suggests that the associations between family factors and children's development are mediated by their effects on parenting. Of the various family factors identified above, indices of SES appear to be particularly strongly related to children's development. With respect to income, a substantial amount of both correlational and experimental research indicates that children from low-income families are at greater risk for poorer socioemotional and cognitive outcomes than are children from middle-class families (McLoyd, 1998b). Nonexperimental studies that have focused on young children have documented relations between indices of SES and toddlers' noncompliance and negative affect (Belsky, Woodworth, and Crnic 1996), preschoolers' problem behaviors (Campbell, Shaw, and Gilliom 2000; Jackson et al. 2000) and 5-year-olds' internalizing and externalizing behaviors and aggression toward peers (Dodge, Pettit, and Bates 1994; Duncan, Brooks-Gunn, and Klebanov 1994). In addition, negative associations between economic disadvantage and children's cognitive and achievement outcomes are well documented and are typically stronger than relations between economic disadvantage and socioemotional outcomes (e.g., McLoyd 1998a, 1998b). McLoyd (1990) delineated a model in which the stresses of chronic poverty put parents at risk for psychological distress, which in turn is linked to less sensitive and less nurturant parenting and less optimal outcomes in children. Empirical investigations involving children's socioemotional outcomes are generally consistent with this model (e.g., Belsky, Woodworth, and Crnic 1996; Dodge, Pettit, and Bates 1994). With respect to cognitive outcomes, the degree of learning and language stimulation provided in the home accounts for a substantial portion of the negative association between low family income and children's cognitive development (Magnuson and Duncan 2002; McLoyd 1998b).

Finally, evidence from experimental studies of welfare-to-work programs indicates that increases in family income are associated with better cognitive, academic, and socioemotional outcomes in school-age children, although the

findings do not generalize to adolescents. Increases in maternal educational attainment are also associated with better cognitive and academic outcomes in school-age children (Zaslow et al. 2002). Those effects are not mediated by parenting behavior; in general, welfare-to-work programs show few effects on parenting (Chase-Lansdale and Pittman 2002). Program participants, however, are more likely to enroll their children in formal child care, after-school care, and extracurricular activities than are control-group parents, suggesting that increases in income allow parents greater opportunity to provide enriching experiences for their children. Those experiences may mediate the associations between increased income and positive child outcomes in these studies (Chase-Lansdale and Pittman 2002).

In summary, a number of family characteristics may be important in understanding children's development. In particular, the quality of parenting is relevant to understanding how families influence children's development. Evidence suggests that parenting behavior mediates the effects of other family characteristics, such as parental mental health, marital quality, and parental social support. SES (which includes parental education and income) is also an important influence on children's development. More specifically, children from low-income families are at greater risk of poor outcomes than are their middle-class peers. Note that because many nonexperimental studies use a single measure that combines family education and income, it is not always clear which component may underlie significant effects. In general, however, the effects of income tend to be more consistent than those of parental education, although evidence from experimental welfare reform studies (Zaslow et al. 2002) as well as from nonexperimental studies that control for parental cognitive ability (e.g., Mayer 1997) indicates that maternal education is also relevant to children's outcomes. As with other family characteristics, parenting partially mediates associations between indices of SES and children's development. Evidence also indicates, however, that SES is a particularly strong correlate of children's outcomes and has the potential to affect children's development through multiple pathways, including, for example, children's access to enriching experiences outside the home.

As noted above, family factors such as SES, parental mental health, parental social support, and marital quality are correlated with individual differences in parenting quality. In addition, those factors are also correlated with each other; as a consequence, although they are conceptually distinct, they are likely to covary within families in predictable ways. Thus, for example, parents' education and income are positively correlated with parental mental health and social support as well as positive parenting behavior. Because of this covariation, isolating the effects of specific family factors on children's development is difficult.



## FAMILY CHARACTERISTICS AND CHILD CARE CHOICES

Although the family is clearly important in the development of young children, many young children spend considerable time in other settings. The growing concern for the role of child care in children's development parallels changes in how young children are reared, particularly middle-class children. In 1975, 34% of mothers of children younger than 6 years old were in the labor force and used child care, whereas by 1999, that figure had increased to 61% (NICHD 2003a). Moreover, approximately 58% of women with infants younger than 12 months old are employed outside the home (NICHD 2003a). Paralleling this increase in maternal employment and use of child care for young children, the study of the association between qualities of child care and children's development has exploded over the past two decades.

This literature has long noted that to understand the effects of child care, one must take into account aspects of child care that are associated with family characteristics. Evidence indicates that the type of child care that parents select, as well as other parameters of care (e.g., age of entry, amount, and quality), is correlated with demographic, economic, and psychosocial family variables (Burchinal and Nelson 2000; Burchinal et al. 1995; Deater-Deckard, Pinkerton, and Scarr 1996; Howes 1990; Lamb 1998; NICHD 1997b; Vandell and Corasaniti 1990). For example, higher levels of family income and education, as well as sensitive parenting and child-centered attitudes, are generally correlated with better quality child care.

Many early studies did not concern themselves with the issue of selection, which clearly poses alternative explanations for findings concerning the link between child care and child development. For example, if one finds that high-quality care is associated with good cognitive outcomes for children, is that because of the quality of the child care experience or because the children with high-quality child care tend to come from advantaged homes with well-educated parents—environments that the research says tend to produce children with better cognitive development? Studies that consider the impact of child care on child development must simultaneously consider the quality of family relationships and aspects of the family situation.

The most comprehensive study to date of child care and children's development is the NICHD Study of Early Child Care (NICHD 1997b), which includes more than 1,200 families in 10 locations across the country. This study represents an enormous investment of the federal government in a well-designed longitudinal study that includes extensive measurement of family and child care variables from birth through school age. The NICHD study has the same limitations as all nonexperimental studies, most notably the problem of selection effects. Different approaches exist for dealing with this

problem (Burchinal and Nelson 2000; Duncan and Gibson-Davis 2006). The approach taken by the NICHD study and most other recent studies of child care is to control statistically for family factors and child characteristics that could bias estimates of the impact of child care. Duncan and Gibson-Davis (2006) raise legitimate concerns about the way in which this strategy has been implemented in the NICHD study and make a convincing argument that, in the absence of evidence of multicollinearity among predictors, it is better to control for as many potentially biasing family and child variables as possible. In most analyses of the NICHD data, a subset of family and child variables is controlled, although data on an extensive set of covariates is available. It is unclear to what extent selection effects may bias estimates of child care effects in those analyses.

With respect to nonexperimental studies of community-based child care arrangements, which constitute the bulk of the research literature, interpretation of findings is complicated by additional limitations, even among studies that make an effort to control for possible selection effects. For example, many studies focus on particular aspects of child care experiences, such as age of onset or quantity, without obtaining data on other aspects of care, particularly child care quality, that could quite plausibly affect children's outcomes (e.g., Bates et al. 1994; Baydar and Brooks-Gunn 1991; Burchinal et al. 1995; Caughy, DiPietro, and Strobino 1994; Vandell and Corasaniti 1990). In many longitudinal studies, data on child care experiences are collected at one point in time and related to children's outcomes at a later point, with no data available on intervening child care or school experiences that might affect child outcomes (Burchinal et al. 1995; Caughy, DiPietro, and Strobino 1994; Deater-Deckard, Pinkerton, and Scarr 1996; Vandell and Corasaniti 1990). Given the evidence that child care arrangements are likely to change over time and that the quality of child care is only modestly correlated over time (NICHD 2003b), this approach is questionable. In other studies, information about the amount, type, and timing of child care experiences is obtained retrospectively from parents, an approach that raises questions about the accuracy of the data, particularly when parents are asked to recall several years' worth of information (e.g., Bates et al. 1994; Baydar and Brooks-Gunn 1991; Burchinal et al. 1995; Caughy, DiPietro, and Strobino 1994; Vandell and Corasaniti 1990).

With respect to those issues, the NICHD Study of Early Child Care has significant advantages compared to most other nonexperimental studies. The sample is quite large and, although not nationally representative, includes families from a range of geographic locations across the United States and is relatively diverse (e.g., 24% are ethnic minority children, 11% are mothers without a high school education, and 14% are single mothers). Data on a

wide range of family and child variables have been collected at multiple points in time. In addition, extensive data on the timing, amount, and type of child care arrangements, as well as multiple measures of child care quality, have been collected at frequent intervals. Consequently, this review of non-experimental data mainly focuses on the findings of the NICHD study.

In general, evidence indicates that family factors are as important in predicting children's development for those who experience extensive amounts of nonmaternal care as they are for those without such experiences. In addition, nonexperimental data indicate that aspects of child care, particularly quality, are significantly related to children's development even after controlling for family and child characteristics. The effects of child care, however, are typically quite modest in nonexperimental studies of community-based child care settings, including the NICHD study. The research suggests that family factors are a consistently stronger predictor of children's development than child care experiences are, although the research has significant limitations. This is, however, only an average. Evidence from both nonexperimental studies and experimental child care interventions suggests that child care experiences may have stronger effects for some children than for others. The available evidence leads to the conclusion that child care parameters, especially quality, are likely to be particularly important for children whose family environments are less than optimal. This article now turns to a discussion of the research underlying the above assertions.

### **THE IMPACT OF EXTENSIVE AMOUNTS OF CHILD CARE**

An important question that has emerged as research on child care and children's development has accumulated is whether observed associations between family factors (e.g., SES, parenting quality, and marital conflict) and children's outcomes are different for children who experience extensive care outside of the family setting. Specifically, it has been suggested that the influence of family factors may be weakened when children experience greater amounts of nonparental care.

Howes (1990) obtained evidence consistent with this hypothesis. In comparing preschool and kindergarten children with and without child care experience during infancy, she found that parental behavior was more strongly related to individual differences in children's social and cognitive outcomes when children had not experienced regular child care during their first year of life. Other evidence suggests that children's attachments to their child care providers are stronger predictors of later social competence than their attachments to parents, at least in some contexts (Howes, Matheson, and Hamilton

1994; Oppenheim, Sagi, and Lamb 1988). However, Clarke-Stewart, Gruber, and Fitzgerald (1994), in a relatively large sample ( $N = 150$ ), failed to find evidence that family factors (including SES, quality of the home environment, and observed parenting) were weaker predictors of children's outcomes for children with child care experiences.

The NICHD study (NICHD 1998b) examined the relative influence of family factors on children's development by comparing a subset of children who experienced 30 or more hours of child care per week beginning at 4 months of age with another group who had never experienced more than 10 hours per week of nonmaternal care up to the point at which children's outcomes were assessed (24 and 36 months). In addition to the advantage of working with a large, diverse sample, the NICHD study included a wider array of measures of a variety of family factors than previous studies had, including income-to-needs ratio, marital status, maternal personality, maternal attitudes about employment and child rearing, and direct observations of the home environment and parenting. Outcomes assessed at 24 and 36 months included measures of children's cognitive and language development, behavior problems, and social competence. Results indicated that the set of correlations between family factors and children's outcomes did not differ for the two groups and that family factors were consistently related to children's development in both groups. Thus, the available evidence indicates that family factors are equally important to children's development for children with different child care experiences.

### **THE RELATION OF FAMILY FACTORS AND CHILD CARE EXPERIENCES TO CHILD DEVELOPMENT**

*Socioemotional development.* One of the most controversial issues concerning the effects of child care is the association between child care in infancy and infant-mother attachment security. Early studies, mostly in middle-class samples, documented higher rates of insecure attachment, as assessed with the Strange Situation procedure (Ainsworth et al. 1978), among infants in child care than among home-reared infants (e.g., Barglow, Vaughn, and Molitor 1987; Belsky 1988; Belsky and Rovine 1988; Clarke-Stewart 1989; Lamb, Stewart, and Prodomidis 1992). The magnitude of differences between home-reared infants and infants in child care was small across the studies, however. Recent studies generally have failed to find relations between child care and attachment security in low-income (e.g., Burchinal et al. 1992) or middle-class samples (e.g., Roggman et al. 1994; Stifter,

Coulehan, and Fish 1993). Interpreting the inconsistencies in the literature is made more difficult because the researchers typically did not control for pre-existing family and child characteristics in the studies.

The NICHD study (NICHD 1997a) has provided the strongest evidence to date regarding the relations between child care experiences and attachment security, both because it has controlled for potential selection effects and because its sample is large and diverse. After controlling for a variety of family and child characteristics, including family income-to-needs ratio, maternal attitudes about the benefits of employment, maternal psychological functioning, maternal sensitivity, and child sex and temperament, no main effects were found for the timing, quantity, quality, or type of child care on attachment security at 15 months. Maternal sensitivity and more optimal maternal psychological functioning, however, were positively related to attachment security.

With respect to other socioemotional outcomes, including compliance, self-control, and behavior problems, nonexperimental data suggest that both child care and family experiences are modestly associated with children's behavior problems; family experiences show more consistent associations than child care (Burchinal and Nelson 2000). For example, data from the Cost, Quality, and Child Outcomes Study, a large, longitudinal study of center-based child care in four states, indicate that positive teacher-child relationships in preschool are inversely related to child behavior problems between ages 4 and 8, although the strength of this association decreases over time (Peisner-Feinberg et al. 2001).

The NICHD study (1998a) has also found associations between low-quality child care and increased rates of behavior problems at 24 and 36 months, as reported by child care providers (but not by mothers), after controlling for family and child characteristics including income-to-needs ratio, maternal psychological adjustment, observed parenting quality, attachment security, and child sex and temperament. In addition, at 24 months children who had spent more total hours in care and who had begun care at a later age were rated by child care providers as having more behavior problems; instability in child care arrangements was related to higher levels of observed noncompliance in the child care setting. Follow-up data (NICHD 2002a, 2003a) on the children at 54 months and in kindergarten are generally consistent with earlier findings. Time spent in child care, controlling for quality and other parameters of care, is positively associated with some indicators of socioemotional adjustment (as reported by mothers, caregivers, or kindergarten teachers), including externalizing problems and conflict with adults at both ages. Again, these effects are generally modest, although they vary by outcome. At all ages, family characteristics, including income-to-needs ratio, maternal education,

and, particularly, maternal sensitivity, are more consistently and strongly associated with children's adjustment than child care characteristics are.

Finally, the NICHD study (2001b) has examined multiple indicators of early peer relationships. As with self-regulatory behavior, child care experiences, particularly quality of care, were modestly related to children's peer competence at 24 and 36 months. Quality of care was the most consistent predictor of children's peer relations within the child care setting, with higher quality care associated with more positive behavior toward peers. Child care experiences, however, only predicted children's behavior within the child care setting and did not generalize to maternal reports of peer behavior or to observational assessments of dyadic play. In contrast, maternal sensitivity was the most consistent predictor of children's positive peer behavior across contexts and informants, although the effect sizes for maternal sensitivity were also modest.

In summary, the findings concerning socioemotional adjustment suggest that child care experiences are not related directly to infant attachment security. With respect to other outcomes in this domain, including early self-regulation and peer relations, child care experiences (particularly quality and quantity of child care) have modest effects, at best, when family factors and child characteristics are controlled. Across outcomes, family factors are more strongly and consistently related to children's socioemotional adjustment than are child care experiences.

*Cognitive and language development.* Studies of community-based child care arrangements and children's cognitive development have found positive relations between the quality of child care and children's cognitive and language skills in low-risk, predominantly middle-class samples (e.g., Broberg et al. 1997; NICHD 2000, 2002a; Peisner-Feinberg et al. 2001) as well as in predominantly low-income samples (Burchinal et al. 2000). In addition, experience in formal care arrangements (i.e., center-based care and child care homes) has been positively associated with cognitive and language skills in predominantly middle-class samples (Broberg et al. 1997; Burchinal et al. 1995; NICHD 2000, 2002a). But as with other outcomes, child care experiences typically account for less variance than family and child factors do in predicting individual differences in children's cognitive and language development (e.g., Andersson 1992; NICHD 2000, 2002a; Peisner-Feinberg et al. 2001). For example, data from the Cost, Quality, and Child Outcomes Study found that for children's cognitive outcomes assessed in late preschool, kindergarten, and second grade, the effect size estimates for maternal education ranged from .12 to .29, whereas effect size estimates for the quality of early preschool care ranged from  $-.01$  to .18. In general, effect sizes for child

care quality were one fourth to three fourths the size of those for maternal education (Peisner-Feinberg et al. 2001).

The NICHD study (2000) has also examined associations between child care and children's early language and cognitive development after controlling for a number of family and child characteristics, including family income-to-needs ratio, maternal verbal ability, maternal cognitive stimulation and the observed home environment, and child sex. The quality of child care, specifically language stimulation, predicted additional variance in cognitive and language outcomes for children in child care. Children who had spent more time in center-based care and child care homes also performed better than children in other types of child care. Consistent with other studies, however, family and child characteristics explained most of the variance in children's cognitive and language development at 15, 24, and 36 months.

The NICHD Early Child Care Research Network and Duncan (2003) estimated causal impacts of child care quality (assessed between 24 and 54 months) on children's cognitive and achievement outcomes at 54 months. The researchers compared the effects of different methods of handling selection bias on the effect sizes obtained for quality of child care. Different methods yielded comparable effect sizes for child care quality (ranging from .04 to .08 for the full sample), but those effect sizes were smaller than the comparable effect size for child care quality reported in earlier analyses predicting 36-month school readiness (.19), in which fewer family covariates were included in predictive models. Notably, controlling for maternal education, child sex, and child ethnicity reduced the effect sizes for quality of care by roughly one half for cognitive and achievement outcomes at 54 months. Experience in center-based care between 27 and 54 months (but not earlier) was also associated with better cognitive and achievement outcomes at 54 months; the effect sizes were larger than those for quality of care (.09 to .33, even in the most conservative models). Finally, in all analyses of the NICHD data, children without child care experiences performed similarly to children with child care experiences at every age assessed.

In summary, studies indicate generally modest relations between aspects of child care experiences and children's cognitive development. High-quality child care is positively related to children's cognitive and linguistic skills (Broberg et al. 1997; Burchinal et al. 2000; NICHD 2000; NICHD and Duncan 2003; Peisner-Feinberg et al. 2001), as is experience in formal care arrangements, such as center-based care or child care homes (Broberg et al. 1997; Burchinal et al. 1995; NICHD 2000; NICHD and Duncan 2003). Family factors and child characteristics, however, typically account for considerably more variance than child care experiences do in predicting individual differences in children's cognitive and language development.

## LIMITATIONS OF EXISTING RESEARCH

A consistent theme in the preceding review is that across domains of development, family factors and child characteristics are more strongly related to individual differences in children's outcomes than are child care experiences. The research, however, has important limitations that qualify this conclusion. The issue of selection effects has already been discussed above. Although it appears from most of the research reviewed that failure to control adequately for selection effects results in an overestimation of child care effects, it is also possible that selection bias may result in the underestimation of child care effects in some cases (Duncan and Gibson-Davis 2006).

An additional important point is that the quality of care observed in non-experimental studies is typically restricted in range: Low-quality child care is less likely to be represented in the sample (Burchinal and Nelson 2000; Duncan and Gibson-Davis 2006; NICHD and Duncan 2003). For example, evidence from the NICHD study indicates that settings of low quality are less likely to be observed because such providers are more likely to refuse consent (Burchinal and Nelson 2000) and that the range of child care settings observed is of higher quality than is probably the case nationwide (NICHD and Duncan 2003). Thus, it is possible that existing studies may underestimate the effects of child care because very low quality care is typically underrepresented in most studies (Burchinal and Nelson 2000; NICHD and Duncan 2003).

## DO CHILD CARE EXPERIENCES MATTER MORE FOR SOME CHILDREN?

The findings discussed thus far underscore the importance of family factors relative to child care experiences in understanding individual differences in children's development. The impact of child care experiences, however, may vary according to the nature of the child's family experiences. A consistent theme in the child care literature is that the impact of child care experiences, including the quality of child care, may be greater for children who are at risk because their family environments are less than optimal. Research examining the potential compensatory effects of child care dates back to the 1960s and focuses mainly on the cognitive development of children considered to be at risk for poor outcomes due to economic disadvantage. Studies in this area include evaluations of large-scale child care intervention programs, such as Head Start, as well as of much smaller model programs.

With the exception of the recent experimental evaluation of Early Head Start (Early Head Start Research and Evaluation Project [EHSREP] 2002),



no studies of large-scale child care interventions, including evaluations of Head Start, have used an experimental design with random assignment, making the potential problem of selection effects inevitable. Indeed, evidence that families receiving Head Start services are more disadvantaged, on average, than Head Start-eligible families that do not receive such services has made interpretation of findings difficult (McLoyd 1998a).

In contrast, a number of small intervention studies have randomly assigned families to treatment and control groups (see McLoyd [1998a] for a review). The experimental design of the studies allows much greater confidence that the observed effects are, in fact, attributable to the program experience. Two of the best known of these intervention programs are the Perry Preschool Project and the Abecedarian Project (McLoyd 1998a). Data from the programs have provided evidence that high-quality, center-based care beginning in preschool or earlier can have both short-term and enduring effects on children's later cognitive ability and academic success. Moreover, the effect sizes obtained are substantially larger than those typically found in nonexperimental studies of community-based child care arrangements. For example, the Abecedarian Project, an intensive educational intervention for low-income children beginning in infancy and continuing until age 5, had effect sizes on IQ of 1.0 at age 3 and .75 at age 5, and the effect size for the 1- to 2-year Perry Preschool Project on IQ was .60 (as cited in NICHD and Duncan 2003). As noted above, in the NICHD study the effect size estimates for 54-month cognitive and achievement outcomes for a one-standard-deviation increase in quality of child care sustained between 24 and 54 months ranged from .04 to .08 for the entire sample. Although other nonexperimental studies representing a wider range of child care quality have reported higher effect sizes over shorter time periods (e.g., .20 to .24 for periods of 6 to 9 months), the effects are still much smaller than those reported for several small-scale experimental interventions, including the Abecedarian Project and Perry Preschool Project (NICHD and Duncan 2003).

The results from experimental child care intervention studies indicate that child care experiences can have strong effects on children's development and that the nature of the samples and the type of child care provided play important roles in study outcomes. The quality of care provided in small-scale experimental intervention programs is typically higher than that provided in large-scale interventions such as Head Start, particularly in terms of structural aspects (e.g., caregiver training and child-staff ratios; McLoyd 1998a). The intensity of services provided may also be much greater. The Abecedarian Project, for example, involved full-time, year-round child care services from infancy to age 5 and has demonstrated stronger, more persistent effects on academic achievement and related outcomes than other small-scale interventions

(e.g., Campbell et al. 2001). On the other hand, findings from the national experimental evaluation of Early Head Start show considerably smaller effect sizes than those often produced by model programs. At the same time, variation within the main pattern of findings suggests the importance of intensity of services. For example, stronger effects on child outcomes were found when families enrolled during pregnancy rather than during the first year of the target child's life (EHSREP 2002).

As noted above, another important factor in understanding the strong impact of some small-scale child care interventions is that all the children participating in such studies are considered at risk for poor outcomes because of economic disadvantage. In some cases, samples are further restricted to include children at additional risk. For example, the Perry Preschool Project included only children with IQs between 70 and 85 (with no evidence of organic causes) at the time of enrollment (McLoyd 1998a). Similarly, the Abecedarian Project included families scoring at or above a preset cutoff on a measure of family risk, which assigned different points depending on risk factors (e.g., the extent of poverty and the degree of maternal education). For example, even extremely low income alone (i.e., less than \$1,000 per year from 1972 to 1977) was not sufficient to reach the cutoff score of 11 points, although families in this lowest income range (8 points) could meet the risk cutoff if mothers also had a ninth-grade education or less (3 to 8 points, depending on grade completed). More generally, the descriptive statistics for the sample suggest that these families were particularly disadvantaged. On average, mothers were 20 years old, had less than a high school education, and had IQs of 85 at the time of enrollment. In addition, only 24% of the families were intact (Ramey and Campbell 1994). In contrast to small-scale interventions, large-scale interventions like Early Head Start are likely to serve a diverse population of low-income families with varying numbers of additional risk factors. One implication is that stronger effects of child care interventions may occur in children from families who face greater risks. From a policy perspective, the available data suggest that greater attention should be paid to the heterogeneity of low-income families (McLoyd 1998a) and that child care interventions need to be tailored to meet the needs of different groups of low-income families. For example, intensive services are likely to be warranted for families with multiple risk factors in addition to low income.

An additional important point is that most of the small-scale child care intervention studies include mostly (or only) African American children. It is unclear whether ethnicity may be related to the nature of the effects observed in these studies because too few White children are included to

make comparisons possible (McLoyd 1998a). However, ethnicity appears to be an important moderator of the effects of Early Head Start on children and families. Specifically, no significant effects were found for child outcomes at age 3 for White children, but there were effects for African American children and, to a lesser extent, Hispanic children. For example, African American children who participated in the program scored significantly higher on a measure of verbal ability (effect size = .23) and lower on the Aggression subscale of the Child Behavior Checklist (effect size = .35) than did African American children in the control group. Effects on parenting measures were also stronger and more consistent for African American families, a result that may partially account for the more positive outcomes of African American children. One factor that is likely to be important in accounting for the findings concerns the initial status of African American, Hispanic, and White children (EHSREP 2002). Within the control group, African American children had lower scores on measures of cognitive development than White and Hispanic children, and African American parents tended to show less optimal parenting behavior than other parents. These findings suggest that African American children and families may have derived more benefits from Early Head Start because they were more disadvantaged initially (EHSREP 2002), a finding consistent with other evidence that child care experiences have stronger effects on children who are at risk for poor outcomes because of suboptimal family environments. The role of ethnicity as a moderator of relations between child care experiences and children's development deserves greater research attention.

The results from child care interventions that are specifically designed to enhance the development of at-risk children do not necessarily generalize to community-based child care arrangements, and research examining interactions between family factors and child care experiences in nonexperimental studies with diverse samples has produced somewhat mixed results. Several studies, however, have found evidence that associations between child care and children's development are moderated by family factors such as maternal education (Peisner-Feinberg et al. 2001), poverty status (Caughy, DiPietro, and Strobino 1994; NICHD 2001a), and parenting quality (NICHD 1997a), such that high-quality child care experiences have more pronounced positive effects for children in suboptimal family environments. At the same time, other findings indicate little or no evidence of compensatory effects of child care for children experiencing greater familial risk (e.g., Bates et al. 1994; NICHD 2002b). Although it is not clear what accounts for discrepant findings across studies, possible explanations include the nature and degree of risk represented in the sample, the nature

of child care experiences, and the specific outcomes examined. In addition, because family and child care environments are correlated, children in families with numerous risk factors are less likely than children whose families have few risk factors to be in high-quality child care, making it difficult to detect potential compensatory effects (NICHD 2002b).

## SUMMARY AND CONCLUSIONS

Family factors play a significant role in children's development. In particular, quality of parenting is associated with a wide range of outcomes in children. With respect to other family characteristics, indices of parental SES stand out as relatively powerful predictors of individual differences in children's development. Evidence indicates that the effects of other family characteristics (e.g., parental mental health, social support, and marital quality), as well as the effects of SES, are partially mediated by parenting.

Research indicates that family factors are equally strong predictors of children's development for children who spend different amounts of time in child care. Although child care experiences are related to children's development across a variety of domains, family characteristics, particularly SES and parenting quality, are stronger predictors of children's outcomes than child care experiences are. An important implication of these findings is that high-quality child care experiences are likely to have stronger effects on children who are at risk of poorer outcomes because of less optimal family environments; evidence from experimental and nonexperimental studies generally supports this conclusion. From a policy perspective, an important goal for future research is to identify subgroups of families within the entire heterogeneous low-income population who are in particular need of intensive services and to develop effective interventions that are tailored to their needs.

## NOTE

1. Following the convention within the developmental literature, we use the term *effect size* to refer to estimates derived from both experimental and nonexperimental (i.e., correlational) data. In contrast, other disciplines restrict the use of the term to estimates that are presumed to be causal (i.e., based on experimental data).

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