
Contemporary Research on Parenting

The Case for Nature and Nurture

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Current findings on parental influences provide more sophisticated and less deterministic explanations than did earlier theory and research on parenting. Contemporary research approaches include (a) behavior-genetic designs, augmented with direct measures of potential environmental influences; (b) studies distinguishing among children with different genetically influenced predispositions in terms of their responses to different environmental conditions; (c) experimental and quasi-experimental studies of change in children's behavior as a result of their exposure to parents' behavior, after controlling for children's initial characteristics; and (d) research on interactions between parenting and nonfamilial environmental influences and contexts, illustrating contemporary concern with influences beyond the parent-child dyad. These approaches indicate that parental influences on child development are neither as unambiguous as earlier researchers suggested nor as insubstantial as current critics claim.

The heredity and environment of an organism can be completely separated only in analytic thinking, for in actual nature such separation would lead to instant death of the organism, even though the philosopher making the analysis might himself survive. (Gesell & Thompson, 1934, p. 293)

Research on parenting has been the centerpiece of long-standing efforts in psychology to understand socialization processes. As the field moves into its second century, however, this focus on parental influence faces several high-profile challenges. One challenge comes from the charge that there is little compelling evidence of parents' influence on behavior and personality in adolescence and adulthood (Harris, 1995, 1998; Rowe, 1994). Another is the allegation that socialization researchers have neglected significant forces other than parenting—forces that may contribute more extensively than parenting to individual differences in adult behavior. The most commonly cited sources of alternative influences are heredity (Harris, 1995, 1998; Rowe, 1994) and peers (Harris, 1995, 1998), although some writers emphasize the relatively greater importance of concurrent environmental forces more generally (e.g., Lewis, 1997).

These criticisms of socialization research generally invoke studies of parenting published before the early 1980s. Neither the assumptions nor the research paradigms that dominated the field as recently as a decade ago, however, represent research on parenting today. Contemporary students of socialization largely agree that early researchers often overstated conclusions from correlational findings; relied excessively on singular, deterministic views of parental influence; and failed to attend to the potentially confounding effects of heredity. Contemporary researchers have taken steps to remedy many of those shortcomings. Unfortunately, the weaknesses of old studies still permeate presentations of socialization research in introductory textbooks and the mass media, partly because they appeal to preferences for simple generalizations instead of the conditional effects that capture the reality of socialization.

Leading-edge approaches to social development and personality no longer rely exclusively on correlational designs, overly simple laboratory analogs, or additive models for assigning variance to one source or another. Contemporary studies, including research on parenting, turn on complex statistical methods and research designs that capture real-world complexity without sacrificing the rigor necessary to infer causal relations. Moreover, conceptual

Editor's note. Jerome Kagan served as action editor for this article.

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Preparation of this article was supported in part by the Rodney S. Wallace Professorship for the Advancement of Teaching and Learning, College of Education and Human Development, University of Minnesota. We thank the following for helpful comments on the manuscript: Marion S. Forgatch, Ben Greenberg, Megan R. Gunnar, Willard W. Hartup, Jerome Kagan, Gerald Patterson, Stephen Suomi, Deborah Vandell, Theodore Wachs, and Richard A. Weinberg.

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models increasingly encompass multiple sources of influence. Researchers draw on emerging knowledge in behavior genetics, neuroendocrine studies, studies of animal behavior, and intervention and prevention science to recognize the complex interplay between inherited and experiential components of individual development. The result is both a more complete and a more differentiated picture of parenting and its likely effects (for comprehensive reviews of contemporary socialization research, see Bornstein, 1995b; Eisenberg & Damon, 1998).

One goal of this article is to outline key features of contemporary approaches to studies of parental socialization. We also show how current researchers have, for some time, been identifying and responding to the very challenges pointed to by recent critics. We pay particular attention to research designs that estimate inherited and other dispositional factors, as well as experiential ones, in estimating influence. We describe several lines of evidence that address issues of causality regarding the scope and nature of parental influences. Finally, we propose that responsible conclusions about the significance of parenting can be based on only the emerging body of research findings that incorporate both individual and social factors and their interrelations.

Contemporary Approaches to Parenting Research

Research during the past two decades has undermined the once tacit assumption that environment should be the sole starting point in explaining individual differences in development. The relevant evidence comes from comparisons of the degree of similarity between individuals who vary in degree of genetic relatedness (e.g., identical vs. fraternal

twins). Typical results imply that heredity accounts for a substantial proportion of this similarity, even though a recent meta-analysis (McCartney, Harris, & Bernieri, 1990) concluded that heredity rarely accounts for as much as 50% of the variation among individuals in a particular population, perhaps even less when personality characteristics are the focus. Although these findings also imply that environment contributes substantially to individual differences, behavior-genetics researchers typically infer environmental effects from the residual after estimates of genetic contributions are computed. The sources of the apparent environmental influences are not specified.

Efforts to understand the role of parents in socialization are constrained severely by the traditional analytic model on which the most cited behavior-genetic findings are based. This "additive" model regards hereditary and environmental components as independent and separable and holds that these two components together account for 100% of the variance in a characteristic (Plomin, 1990). Consequently, most behavior-genetic research has allowed for only main effects of genes and environment, ignoring the possibility that genes may function differently in different environments. A primary problem in disentangling heredity and measures of environmental influences, however, is that genetic and environmental factors are correlated (Plomin, 1990). Researchers consistently find that parenting of identical twins is more similar than parenting of fraternal twins and that two biological siblings typically experience more similar parenting than do two adopted children (Dunn & Plomin, 1986; Plomin, DeFries, & Fulker, 1988; Reiss, Niederhiser, Hetherington, & Plomin, in press; Rowe, 1983). Parents' genotypes, as well as children's genotypes, contribute to these contrasting patterns. That individuals who are more closely related genetically also have more similar shared parental environments means that observed associations between parenting and measures of child characteristics cannot be assumed to be either entirely genetic or entirely environmental in origin. As Rose (1995) stated it, the central question in development is "how genetic effects are modulated across lifespans of environmental interactions" (p. 627).

A related problem further limits the usefulness of traditional behavior-genetic approaches to research on parenting. Estimating the effects of heredity versus environment ignores the potential for malleability, even in characteristics heavily influenced by heredity. When environmental conditions change substantially over time, mean levels of a characteristic also may change, although heritability coefficients (which are based on correlations) may or may not change (Plomin & Rutter, 1998). The problem comes from the failure to recognize that means and correlations can vary independently. Thus, although intelligence has been shown to have a high heritability coefficient, individuals' cognitive abilities can improve or decline as a function of experience (for an explanation of this point, see Weinberg, 1989).

Migration studies often reveal similar paradoxes. For example, height is highly heritable, with heritability coef-



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ficients in the .90s, showing that within a given population, the variation in children's heights is closely linked with the variations in their parents' heights. By inference, very little variance remains to be attributed to environmental factors. At the same time, grandparents born in Japan are, on the average, considerably shorter than their grandchildren born and reared in the United States (Angoff, 1988). In the same way, genetic factors that are highly important in a behavior do not show up in a study of the heritability of that behavior because this genetic factor is uniform for all members of a population. Thus, analyzing the variation of a factor within a population does not provide exhaustive information concerning either the genetic or the environmental contributions to the factor. Large-scale societal factors, such as ethnicity or poverty, can influence group means in parenting behavior—and in the effects of parenting behaviors—in ways that are not revealed by studies of within-group variability. In addition, highly heritable traits also can be highly malleable. Like traditional correlational research on parenting, therefore, commonly used behavior-genetic methods have provided an incomplete analysis of differences among individuals.

To acknowledge the importance of the interplay of heredity and environment, four lines of contemporary research on parenting have emerged. One line of research adopts the additive model of behavior-genetics research but augments it with direct measures of potential environmental influences in an effort to document environmental effects more precisely (Plomin et al., 1988; Reiss et al., in press). A second line of research addresses the insensitivity of additive models to Gene \times Environment effects (Plomin & Rutter, 1998; Rutter et al., 1997) by distinguishing among children with different genetic predispositions on a

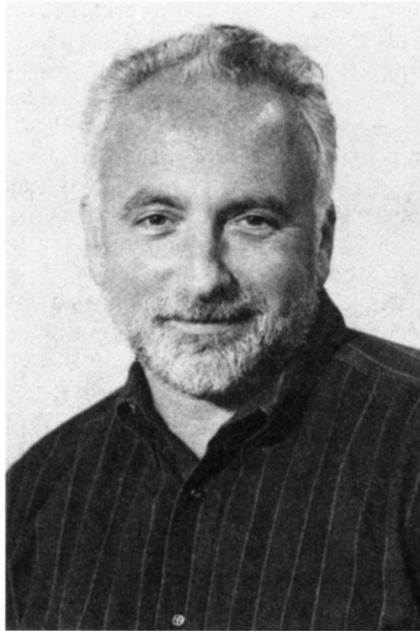
characteristic to see whether they respond differently to different environmental conditions. The distinctions among genetically different groups often rely on measures of temperament or the parent's carrying a known genetic risk factor. A third line of research examines the effect of parental practices after controlling for any initial dispositional characteristics of children. This kind of research is intended to permit inferences about the direction of effects when parent and child characteristics are initially correlated. Evidence on this point comes from three types of research designs: (a) longitudinal studies in which child characteristics at Time 1 are controlled statistically, (b) experiments in which nonhuman animals are exposed to selected rearing environments, and (c) intervention studies either in which "experiments of nature" have resulted in marked changes in parenting experiences or in which families are randomly assigned to different treatment programs designed to improve parenting with resulting changes in child behavior. A fourth line of contemporary studies addresses the possibility that extrafamilial environmental conditions with which parenting is correlated contribute to individual differences in development and behavior.

Augmented Behavior-Genetic Designs

Traditional behavior-genetic designs give primacy to the effects of heredity, relying on a series of computations to reveal which portions of the variance should be labeled as contributions of the shared environment or assigned to nonshared, "other," or "unknown" sources. Although evidence of shared family influences and experiences has appeared for some characteristics such as health habits, alcohol patterns, smoking patterns (McGue, 1994), depression in later life (Gatz, Pedersen, Plomin, Nesselroade, & McLearn, 1992), delinquency as reported by siblings (Rowe, Chassin, Presson, Edwards, & Sherman, 1992), and autonomy and sociability (Reiss et al., in press), the most frequent conclusion has been that shared environments play a small, inconsequential role in children's development.

Many scholars, however, have challenged this inference. One criticism is that the assumptions, methods, and truncated samples used in behavior-genetic studies maximize the effects of heredity and features of the environment that are different for different children and minimize the effects of shared family environments (Goodman, 1991; Hoffman, 1991; Patterson, 1999; Rose, 1995; Stoolmiller, 1999). For example, Stoolmiller (1999) noted that recent adoption studies have been impaired by pronounced range restrictions (about 67%) in the family environments sampled. Stoolmiller argued that the estimated contribution of shared environment likely would be as much as 50% higher if appropriate corrections for range restriction were applied to data from such studies.

A second criticism is that estimates of the relative contributions of environment and heredity vary greatly depending on the source of data (Turkheimer & Waldron, in press). Twin studies typically yield higher heritability estimates for a trait than adoption studies do (Wachs & Plomin, 1991). Moreover, in both types of studies, herita-



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bility estimates vary considerably depending on the measures used to assess similarity between children or between parents and children. The largest effect sizes for environmental influences on social development are found with the relatively rarely used method of direct behavioral observations, whereas the smallest effect sizes for environmental influences are found with parental reports, which are the most commonly used measure in behavior-genetic studies of behavioral outcomes (Emde et al., 1992; Ghodsion-Carpey & Baker, 1997; Miles & Carey, 1997; Rutter et al., 1997; Wachs, 1992). The sizable variability in estimates of genetic and environmental contributions depending on the paradigms and measures used means that no firm conclusions can be drawn about the relative strength of these influences on development.

Traditional twin and adoption studies have been criticized on the grounds that they estimate environmental effects only as a residual: the effects remaining after genetic effects have been estimated and subtracted from 100%. Efforts to rectify this problem by measuring environment directly, however, have failed to clarify the contributions of environment relative to heredity. Most such efforts were stimulated by Plomin and Daniels's (1987) proposal that the environmental variance in behavior-genetic studies emanates largely from experiences that differ for children in the same family. By measuring such differences, researchers hoped to better understand the portion of the variance in behavior-genetic studies not attributed specifically to genetic relatedness. Behavior-genetic analyses, however, can establish that nonshared environment contributes to individual differences in a domain but cannot document the connections between objectively measured nonshared environmental events and development

(Turkheimer & Waldron, in press). Most studies with direct measures of the environment and of the development of multiple siblings within a family, moreover, have not used designs that permit heritability estimates (e.g., Brody & Stoneman, 1994; Tejerina-Allen, Wagner, & Cohen, 1994).

Thus, researchers' attempts to work within the traditional additive model, while augmenting it with direct measures of environment, have yielded findings that are conditional on a series of methodological problems in assessing the relevant environmental factors and in the inherent limitations of the additive model for identifying Gene \times Environment interactions. The remainder of this article is devoted to recent investigations of how processes of influence operate and interact.

The Search for Gene \times Environment Effects

Traditional behavior-genetic models do not afford comparisons of the effects of differing environments on individuals who vary on genetically influenced characteristics. For example, in twin and adoption studies, degree of biological relatedness between individuals, not specific markers of genetically linked characteristics in the two individuals, is the primary focus, and variations in environments are rarely assessed. The most likely possibility is that the forced estimates of main effects for genetic relatedness and environment in the additive model mask virtually ubiquitous correlations and statistical interactions between the two in existing research. Such interactions are notably difficult to detect because of low statistical power in most relevant studies (McCall, 1991; McClelland & Judd, 1993; Wahlsten, 1990). Although some writers (e.g., Harris, 1998) have elected to subsume evidence of Gene \times Environment correlations and interactions under genetic contributions to behavioral development, responsible scholarship requires closer attention to emerging evidence that these effects involve direct parental influences as well (O'Connor, Deater-Deckard, Fulker, Rutter, & Plomin, 1998; Plomin & Rutter, 1998).

The search for Gene \times Environment effects often takes the form of using measures of temperament for the purpose of distinguishing among children with different genetic predispositions to see whether they respond differently to given environmental conditions (Bornstein, 1995b; Plomin & Rutter, 1998; Rutter et al., 1997). Studies that pool parenting effects across children with very different temperaments inevitably obscure actual parental effects. Even when parenting effects are apparent, it is not reasonable to expect that a given style or quality of parenting would have the same effect on every child. Moreover, different parental strategies or degrees of parental effort may be required to bring about the same outcome in different children. Two types of recent studies attempt to disentangle individual children's heredity and the nature of their rearing experiences: (a) studies of the effect of rearing experiences on the behavior of children who differ on measures of temperament and (b) studies comparing the effect of high- versus low-risk environments on children of differing vulnerability.



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Temperament and parenting. Temperamental characteristics, defined as “constitutionally based individual differences in reactivity and self-regulation” (Rothbart & Ahadi, 1994, p. 55), are thought to emerge early, to show some stability over time, but to be modifiable by experience. In general, statistical associations between early temperamental characteristics and later adjustment are modest (see Rothbart & Bates, 1998, for a review), suggesting that these associations also may be moderated by environmental factors. A difficult temperament, characterized by intense negative affect and repeated demands for attention, is associated with both later externalizing and internalizing disorders (Bates & Bayles, 1988; Bates, Bayles, Bennett, Ridge, & Brown, 1991). Early resistance to control, impulsivity, irritability, and distractibility predicts later externalizing and social alienation (Caspi, Henry, McGee, Moffitt, & Silva, 1995; Hagekull, 1989, 1994), whereas early shy, inhibited, or distress-prone behaviors predict later anxiety disorders, harm avoidance, and low aggression and social potency (Caspi & Silva, 1995).

Correlations between temperamental characteristics and parental behavior reflect bidirectional interactive processes, as well as genetic linkages between parent and child characteristics. Temperamental characteristics may set in motion a chain of reactions from others that put children at risk or protect them from developing behavior and psychological problems (Caspi & Elder, 1988; Hetherington, 1989, 1991; Quinton, Pickles, Maughan, & Rutter, 1993; Rutter, 1990; Rutter & Quinton, 1984; Werner, 1990). Difficultness, irritability, and distress proneness in infants evoke hostility, criticism, a tendency to ignore the child, avoidance, coercive discipline, and a lack of playfulness in mothers (Lee & Bates, 1985; Rutter & Quinton, 1984; Van

den Boom, 1989). These reactions, in turn, are associated with avoidant (Grossman, Grossman, Spangler, Suess, & Unzner, 1985; Van den Boom, 1989) or insecure-ambivalent attachment (Goldsmith & Alansky, 1987; Miyake, Chen, & Campos, 1985). Bates, Pettit, and Dodge (1995), in a longitudinal study, found that infants’ characteristics (e.g., hyperreactivity, impulsivity, and difficult temperament) significantly predicted externalizing problems 10 years later. Although this finding at first seems to support the lasting effects of physiologically based characteristics, Bates et al. (1995) also showed that predictive power increased when they added information about parenting to the equation. Infants’ early characteristics elicited harsh parenting at age 4, which in turn predicted externalizing problems when the children were young adolescents, over and above the prediction from infant temperament. Similarly, this and other findings imply that even though parental behavior is influenced by child behavior, parents’ actions contribute distinctively to the child’s later behavior. For example, in a longitudinal adoption design, O’Connor et al. (1998) confirmed that children at genetic risk for antisocial behavior elicited more negative parenting from adoptive parents than did children not at risk. They also found, however, that “most of the association between negative parenting and children’s externalizing behavior was not explicable on the basis of an evocative gene-environment correlation and that an additional environmentally mediated parental effect on children’s behavior was plausible” (p. 970).

Bidirectional and interactive effects of this kind now appear to carry significant implications for distinctive effects of parenting variations on children who differ in temperamental characteristics. In longitudinal work on the socialization of “conscience,” Kochanska (1995, 1997) found that maternal use of gentle childrearing techniques that deemphasized power assertion was more effective with temperamentally fearful children than with bolder, more exploratory children in promoting the development of conscience. With bolder children, maternal responsiveness and a close emotional bond with the child were more important in fostering conscience. Similarly, the quality of parenting to some extent moderates associations between early temperamental characteristics of difficultness, impulsivity, and unmanageability and later externalizing disorders (Bates, Pettit, Dodge, & Ridge, 1998; Rothbart & Bates, 1998). Firm, restrictive parental control has been linked to lower levels of later externalizing in early difficult, unmanageable children (Bates et al., 1998). Although only a few studies have examined the moderating effects of parenting on the links between temperamental predispositions and later adjustment, and although not all of these studies have had positive results (Rothbart & Bates, 1998), the evidence nevertheless suggests that parenting moderates these associations.

Studies of risk and resiliency. Parallels to these differential relations between parenting and child behavior can be found in studies of risk and resiliency. Children who showed early developmental problems be-



Marc H. Bornstein

cause of risk factors such as perinatal damage (Werner & Smith, 1992) improved in adjustment under authoritative parenting. Parenting, moreover, appears to play a mediating role between parental psychopathology and child symptoms of disorder (R. Conger, Ge, Elder, Lorenz, & Simons, 1994; Ge, Conger, Lorenz, Shanahan, & Elder, 1995; Ge, Lorenz, Conger, Elder, & Simons, 1994). For example, Downey and Walker (1992) demonstrated that children with a psychiatrically ill parent who were not exposed to parental maltreatment, in contrast to those who were, showed very low levels of both externalizing and internalizing. That different outcomes for children are associated with differential parental responses to the same risk factor implies parental influence, although Downey and Walker cannot rule out evocative behavior on the part of the child.

A Finnish adoption study (Tienari et al., 1994) further illustrates how a genetic predisposition can either manifest itself or not, depending on whether certain triggering environmental conditions are present. Adoptees who had a schizophrenic biological parent were more likely to develop a range of psychiatric disorders (including schizophrenia) than were adoptees not at genetic risk, but only if they were adopted into dysfunctional families (see also Cadoret, 1985). Similar findings have been reported from studies of adopted children whose biological parents had a history of criminality (Bohman, 1996). If adopted into well-functioning homes, 12% of these children displayed petty criminality in adulthood. However, if adopted into families carrying environmental risk, their rate of petty criminality in adulthood rose to 40%. These findings suggest that well-functioning parents can buffer children at genetic risk and circumvent the processes that might ordinarily lead from genotype to phenotype. The more general point is that genetic vulnerabilities (or strengths) may not be manifested except in the presence of a pertinent environmental trigger such as parenting.

Studies of Parental Influence, Controlling for Initial Child Characteristics

A third line of research attempts to provide a basis for examining instances in which parental behavior may exert a causal influence in changing children's behavior. Studies of this type subsume several research strategies. One strategy is longitudinal research in which children's initial characteristics can be observed to change over time in relation to specific parenting experiences. Even more compelling evidence for determining the causal status of parenting, however, involves experimental manipulations. In some recent experiments, young nonhuman animals were exposed to measurably different rearing conditions. Some experiments of nature with humans also have provided evidence of this kind. The most compelling evidence, however, comes from interventions in which parents are assigned randomly to behavior-change treatment groups, with resulting changes in the behavior of both the parents and their otherwise untreated children. Random assignment is the means for ensuring that treatment groups are not initially different.

Longitudinal studies of parenting and child development. The most widely used strategy in contemporary studies of socialization uses short-term longitudinal designs to better distinguish parenting effects from the characteristics of the child (e.g., Ge et al., 1996; Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994). In these studies, aspects of child functioning and development are measured at more than one point in time. Statistical procedures, such as the analysis of covariance or multiple regression, are then used to estimate the relation between parenting at one point in time and child outcomes at some subsequent point, after taking into account characteristics of the child at the time that parenting was assessed. Studies showing that the over-time effect of parenting on child development holds even after controlling for earlier child characteristics are important for several reasons. First, in the absence of a randomized experimental design, this strategy provides indirect evidence that parenting conceivably affects—rather than simply accompanying or following from—child adjustment. Such indirect evidence is important because one cannot randomly assign children to different home environments. These analyses do not rule out the possibility that different children elicit different parental responses, but they do provide evidence that the correlation between child adjustment and parenting is not due *solely* to the effect of children on parenting behavior.

Significant longitudinal relations between parenting and child adjustment after taking into account their concurrent relation also help to rule out a number of third-variable explanations, including the possibility that the observed association is due to factors that parents and their children share, such as genes or socioeconomic status. To be a viable explanation for the observed association, a third variable would have to be correlated with the measures of child adjustment at the time of the longitudinal follow-up

but not correlated with the same measures taken earlier. Any genetically mediated link between parenting and child adjustment, for example, would be taken into account by controlling for the concurrent relation between parenting and child adjustment before examining their relation over time.

Rearing experiments with animals. Recent work with nonhuman animals points clearly to the fact that experience—that is, encountering or engaging with the environment—influences brain development in young organisms and that these changes in the brain are associated with changes in behavior (Greenough & Black, 1992). Although some of the relevant environmental events must occur during a sensitive period to affect development (Bornstein, 1989), the mammalian brain generally remains malleable by environmental inputs well into adulthood (Huttenlocher, 1994; Nelson, in press). Environmental events that have to do with the amount or kind of “parenting” that a young organism receives are essential for survival in all mammalian species. The presence and activities of the infant stimulate a set of maternal behaviors needed by the infant (including but not confined to feeding), and these reciprocal maternal behaviors serve to facilitate the infant’s adaptation and development (e.g., Stern, 1985). Studies of higher mammals confirm that, as these interactions continue to occur, an intense emotional bond is formed such that separation of the pair produces distress and behavioral disruption in each member of the pair. Studies in which young animals have been deprived of “mothering” have shown clearly that such deprivation not only disrupts the ongoing behavior of the young animal at the time of deprivation but also leads to dysfunctional outcomes for the offspring in the long term.

Current animal work is addressing implications of naturally occurring variation, within the “normal” range, in maternal behavior. Meaney and Plotsky and their colleagues (Caldji et al., 1998; Liu et al., 1997) have studied styles of mothering in rats, relating variations in these styles to behavioral outcomes in their offspring. Maternal animals differ considerably in the frequency with which they lick and groom their newborn pups and in whether they arch their backs to facilitate nursing or lie passively on top of or next to the pups. Individual differences in these mothering styles have been shown to be quite stable. In adulthood, moreover, the offspring of mothers who had done more licking and grooming and had nursed with arched backs (high LG-ABN mothers, whom we can call *nurturant*) were less timid in leaving their home cages to obtain food or explore a novel environment than were the offspring of low LG-ABN mothers. These outcomes are correlated with neuroendocrine processes. As adults, rats who had experienced high levels of maternal licking and grooming as newborns showed reduced levels of adrenocorticotrophic hormone and corticosterone in response to a stressful condition (close restraint). Furthermore, differences emerged in the densities of receptors for stress hormones in several loci in the brains of animals that had experienced the two different kinds of maternal styles in

their first 10 days of life. Thus, early mothering styles apparently affected the neural circuitry that governs behavioral stress responses in the offspring as they grow into adulthood.

To determine whether there is an independent effect of maternal styles per se on these outcomes, apart from any genetic mediation, researchers have cross-fostered infants born to a low-nurturant mother to rearing by a high-nurturant mother. Early findings (Anisman, Zaharia, Meaney, & Merali, 1998) show that these infants manifest the benefits of their early rearing in their modified adult stress reactions, by comparison with infants born to low-nurturant mothers and reared by them.

Corroborating evidence comes from studies with non-human primates (Suomi, 1997). Suomi and colleagues initially observed naturally occurring individual differences in “emotional reactivity” among Rhesus monkeys. In early life, some animals are hesitant about exploring new environments and show extreme reactions to separation from their mothers, whereas others characteristically react more calmly. Individual animals’ reactivity patterns remain quite stable over many years. These patterns of behavior are accompanied by distinctive neuroendocrine patterns. The behavioral and physiological indicators that distinguish highly reactive animals from less reactive ones are especially apparent under environmentally stressful conditions (Suomi, 1997).

When young Rhesus monkeys with clearly different reactivity patterns are cross-fostered to mothers who are either reactive (easily distressed) or nonreactive (calm), their adult behavior is quite different from that shown by the biological offspring of each type of mother. Genetically reactive young animals that are reared by calm mothers for the first six months of their lives and then placed in large social groups made up of peers and nonrelated older adults develop normally and indeed rise to the top of their dominance hierarchy. Further, these cross-fostered animals are adept at avoiding stressful situations and at recruiting social support that enables them to cope with stress. By contrast, genetically reactive infants who are reared by reactive mothers typically are socially incompetent when placed in the larger living group at the age of six months and are particularly vulnerable to stress. In general, the introduction of stressful conditions seems to make the effects of early rearing experience especially perceptible (Suomi, 1997). Thus, variations in mothering style have a lasting effect on the reactivity of the young animals when they move into new social contexts. Moreover, the quality of early mothering now has been found to affect the way genetically at-risk females parent their own offspring. If cross-fostered to low-reactive mothers, they are competent parents with their own offspring; if raised by high-reactive mothers, they manifest mothering deficits.

Recent work (Suomi, in press) has shown that the genetic make-up of young monkeys influences how large an effect early rearing conditions will have. A gene has been identified for which one allele is associated with a highly reactive temperament and the other allele with a

calmer temperament. Certain aspects of the neuroendocrine system (i.e., serotonergic functioning) are controlled by this gene. Maternal deprivation has a powerful effect on the genetically reactive monkeys, producing deficits in their neuroendocrine functioning and in their behavioral and emotional reactions. For the animals not carrying the genetically risky allele, however, maternal deprivation has little effect.

These recent studies trace some of the complex steps in the long pathway between genes and phenotypic behavior. The findings show that both genes and parenting affect brain processes and neuroendocrine systems. These studies point to a future in which researchers will be able to provide more detailed information about the interplay of heredity and parenting influences than traditional twin and adoption studies can yield.

Experiments of nature. No extensively controlled rearing experiments have been conducted with human children, but several natural experiments have yielded information that is strikingly parallel to the findings of the cross-fostering work. A recent example is found with the children who had lived in Romanian orphanages for some months or years in early childhood, during which time they were deprived of the opportunity to form a close bond with a single trusted adult caregiver. Some of these children have been adopted into middle-class homes in other cultures. The effects of the early deprivation appear to depend on its duration. Recent follow-up measures at age six in a group of Romanian orphans adopted by Canadian families show that children adopted during approximately the first half-year of life manifest no lasting effects of their early experience. But children adopted later have been found to have abnormally high levels of cortisol during the ordinary daily routine of their adoptive homes, indicating that the neuroendocrine system involved in stress regulation has not developed normally (Chisholm, 1998; Chisholm, Carter, Ames, & Morison, 1995; Gunnar, in press; see also Rutter & the ERA study team, 1998).

An example of variations in parenting that are more within the normal range comes from France, where 20 children were located who had been abandoned in infancy by their low-socioeconomic-status parents and adopted by upper-middle-class parents (Schiff, Duyme, Dumaret, & Tomkiewitz, 1982). These children all had biological siblings or half-siblings who remained with the biological mother and were reared by her in impoverished circumstances. The researchers were unable to find any selective factors that might have made the abandoned children more genetically promising than the ones retained at home. When tested in middle childhood, however, the adopted children's IQs averaged 14 points higher than those of their natural siblings. By contrast, children who remained with their biological mothers were four times more likely to exhibit failures in their school performance. These results are consistent with those of several other early adoption studies (e.g., Skodak & Skeels, 1949; Scarr & Weinberg, 1976, 1978) showing that adoption into well-functioning

middle-class homes can provide a "bonus" in cognitive functioning for the children involved.

What aspects of living in more advantaged homes were responsible for these children's cognitive and educational gains is not known. Was it the more stimulating, more cultured, more educated environments provided by the adoptive parents, or were there greater amounts of parent-child interaction or more secure attachments? We can only suspect that something about the way these adoptive parents dealt with the children contributed to the effect. Evidence from the Colorado Adoption Project provides some suggestive evidence for a bidirectional process. The Colorado project included data on rates of communicative development in groups of 12-month-olds either born or adopted into intact families (Hardy-Brown, 1983; Hardy-Brown & Plomin, 1985; Hardy-Brown, Plomin, & DeFries, 1981). Biological mothers' verbal intelligence correlated with the language competencies of children they had not seen since birth. Reciprocally, however, adoptive mothers' activities, like imitating their infants' vocalizations and vocalizing responsively and contingently to infants' vocalizations, also predicted child language competencies. Similarly, another comparison of children with their biological and their adoptive parents (Scarr & Weinberg, 1978) showed that correlations between the vocabulary scores of adoptive mothers and children were as high as those between the vocabulary scores of biological mothers and their children. Like other examples cited earlier, these findings clearly show the distinct contribution of parental behavior over and above the contribution of heredity.

Interventions with human parents. Finally, interventions that seek to change the mean level of a behavioral or personality characteristic in children provide additional evidence of the efficacy of parenting. Efforts to manipulate parental behavior for the purpose of influencing child behavior are surprisingly rare. Laboratory analog studies (e.g., Kuczynski, 1984), although documenting short-term effects of specific behaviors of parents, cannot establish that such behaviors significantly influence broadband outcomes for offspring. The primary source of relevant information for human children comes from evaluations of programs designed to remediate or prevent socialization problems. Such programs typically target the behavior of either children alone or both children and parents. Of particular relevance to socialization, however, are studies in which the behavior of parents, but not the children, is the target of the manipulation. If the manipulation produces desired changes in the parent's behavior and if the degree of change, in turn, is associated with changes in the child's behavior, the evidence for the causal influence of parents is compelling. Unfortunately, only a few such programs focus on improving parental behavior, and even fewer estimate the causal influences of changes in parental behavior on child outcomes (for reviews, see Cowan, Powell, & Cowan, 1998; McMahan & Wells, 1998).

An exception is a recent prevention program intended to foster more effective parenting following divorce (For-

gatch & DeGarmo, 1999). School-age sons of recently divorced single mothers often manifest increased academic, behavioral, social, and emotional problems relative to sons of nondivorced mothers, and the divorced mothers themselves commonly behave toward their sons in a more coercive and less positive manner than nondivorced mothers do (Chase-Lansdale, Cherlin, & Kiernan, 1995; Hetherington, 1993; Zill, Morrison, & Coiro, 1993). In most reports, however, the direction of causality is unclear. Forgatch and DeGarmo sought both to address the causality issue and to test a method for preventing these apparently negative sequelae of divorce. They designed group-intervention and individual follow-up procedures for 153 recently divorced mothers who met three criteria: They had been separated from their partners within the prior 3 to 24 months, they resided with a biological son in Grades 1 through 3, and they did not cohabit with a new partner. Initial observational, self-report, and teacher report measures of both mothers' parenting and children's behaviors were used to control for possible genetically influenced differences among parent-child pairs. Random assignment ensured that the treatment group was not systematically different from the control group of 85 mothers and sons who also met the screening criteria. No intervention was provided to the children. At the end of 12 months, treatment-group mothers generally showed less coercive behavior toward children and less decline in positive behavior than control-group mothers did (although both treatment- and control-group mothers manifested at least temporary declines in positive behavior during the year following divorce). Moreover, the degree of change in the mothers' behavior over the course of 12 months significantly predicted the degree of change in the children's behaviors. Changes in parenting practices were associated significantly with changes in teacher-reported school adjustment and with changes in both child-reported and parent-reported maladjustment. Estimated effect sizes for these correlated changes ranged from .032 to .144 (M. Forgatch, personal communication, November 1, 1999). These effect sizes are small to medium, according to Cohen's (1988) criteria.

Other intervention attempts with parents have yielded similarly impressive evidence. Cowan and Cowan (in press), in a randomized design, showed that parents' participation in a 16-week series of discussion groups on effective parenting just prior to their children's kindergarten entry resulted in better school adjustment and higher academic achievement for children in kindergarten and first grade, compared with children whose parents attended a series of discussion groups without the effective-parenting emphasis. The relative advantage for the children of intervention-group parents has persisted through age 10, a period of six years. With parents of infants, Van den Boom (1989, 1994) demonstrated that an intervention to train lower-class mothers to respond sensitively to their infants both modified the negative responses of mothers to infant irritability and reduced the extent of avoidant attachment in distress-prone infants. Similarly, Belsky, Goode, and Most

(1980) found that interventions to increase mothers' didactic interactions with infants during play resulted in significantly higher exploratory play among infants, compared with a no-treatment control group. In interventions to improve the behavioral-training skills of parents of noncompliant children, Forehand and colleagues demonstrated both improvements in parental behavior and behavioral changes in the children, as well as increased parental perceptions of improved child behavior and decreased parental depression (Forehand & King, 1977; Forehand, Wells, & Griest, 1980). Depending on the content of the maternal training, children have been shown to manifest differing patterns of competence. Riksen-Walraven (1978) showed that infants of mothers trained in responding demonstrated higher levels of exploratory competence, whereas infants of mothers trained on improving sensory stimulation habituated more efficiently. When interventions are effective, behavior change tends to be long-lasting (Patterson, 1975).

Findings from studies of parenting-focused interventions provide the strongest evidence available on the efficacy of parenting behavior in humans. Whether naturally occurring behaviors of the kind encouraged by these experimental programs account for behavioral development is more difficult to establish. Nevertheless, the increasing use of multimethod, multi-informant assessments and structural equation modeling is helping to overcome some of the shortcomings of traditional correlational studies of socialization and behavior-genetic studies using single informants (Rutter et al., 1997). These more methodologically rigorous studies (e.g., R. Conger & Elder, 1994; Forgatch, 1991; Kim, Hetherington, & Reiss, 1999) generally yield associations between parenting and child outcomes, with appropriate controls for Time 1 status on outcome measures, that meet Cohen's (1988) criteria for small or medium effect sizes. Some studies (e.g., Kochanska, 1997) yield impressively large effect sizes. Even small effects of parenting, however, are likely to become large effects over time (Abelson, 1985). Parental behavior has been shown to be highly stable across time (Holden & Miller, 1999). Thus, specific parental influences, consistently experienced, likely accumulate to produce larger meaningful outcomes over the childhood and adolescent years.

Studies of Links Between Parenting and Other Influences

Current investigations address a further challenge from recent critics of parenting research as well: the need to consider environmental influences other than parents in accounting for differences among children. Socialization research today is guided by an ecological perspective on human development (Bronfenbrenner, 1979; for recent reviews, see Bornstein 1995a, 1995b; Bronfenbrenner & Morris, 1998). Families are seen as important influences on children, the effect of which can be understood only in light of the simultaneous influence of social spheres such as peer groups and schools. These influences occur within broad contexts (e.g., neighborhood, cultural context, historical epoch) that add to, shape, and moderate the effect of the

family. The ecological perspective not only emphasizes the potential significance of extrafamilial influences on the child's development but also, more importantly, stresses the interactive and synergistic, rather than additive and competitive, nature of the links between the family and other influences. In this section we consider the implications of this view for parenting in relation to two extrafamilial influences on socialization: peers and macrocontexts of parent-child relations.

Relations of parental and peer influences.

In an earlier era, socialization researchers cast families and peers as opposing forces vying for influence over the child's behavior. In much the same way that recent developments in behavior genetics have challenged the wisdom of attempting to estimate how much variance in a trait is attributable to genes versus the environment, contemporary models of socialization no longer ask whether children are influenced more by parents or by peers. Today, socialization researchers develop and test models that examine how parents and peers exert conjoint influence on the developing child (e.g., Brown, Mounts, Lamborn, & Steinberg, 1993; Cairns & Cairns, 1994; Dishion, Patterson, Stoolmiller, & Skinner, 1991; Fuligni & Eccles, 1993; Mounts & Steinberg, 1995).

This new direction rests on four findings that have emerged consistently from research on parent and peer influences. The first finding is that the observed similarity between adolescents and their friends across a wide array of variables, including school achievement (Epstein, 1983), aggression (Cairns, Cairns, Neckerman, Gest, & Garipey, 1988), internalized distress (Hogue & Steinberg, 1995), and drug use (Kandel, 1978), is due mostly to the tendency for individuals to select like-minded friends, as well as to the influence that friends have over each other (Berndt, 1999; Berndt, Hawkins, & Jiao, 1999). Children are not randomly assigned to peer groups. Although unambiguous estimates of the relative effect of selection and influence effects are not available, a child with antisocial inclinations may be far more likely to fall into a similarly inclined peer group than an antisocial peer group is to corrupt a well-behaved youngster. Similarly, an academically oriented child may be more likely to select academically oriented friends than a child who is not interested in school is to develop a passion for achievement because his or her friends are so inclined. Equating peer influence with peer similarity overstates considerably the extent of peer influence, because the equation fails to take account of the selection effect (Bauman & Fisher, 1986).

The second finding is that peer influence often operates with respect to everyday behaviors and transient attitudes, not enduring personality traits or values (Brown, 1990). Most studies examining individuals' religiosity, educational plans, and occupational choices, for example, reveal that parental influence on adolescent personality development is deeper and more enduring than that of peers (Brown, 1990). To be sure, even transient peer influences over day-to-day behaviors can have enduring sequelae that are opposed to what parents might desire (e.g., peer influ-

ence to become sexually active can result in an unplanned pregnancy and foreshortened educational attainment; peer influence to engage in criminal activity can result in a jail sentence). However, because peer influence tends to be immediate, its content changes with shifts in friendships. Studies that track individuals through adolescence often reveal that young adults are more similar to their parents than they had appeared to be as teenagers (J. Conger, 1971).

The third finding is evidence of the significance of parents and parent-child relationships in influencing which peers children select. Any psychological snapshot taken during adolescence, when peers are undeniably an important force in children's lives, rightly should be viewed as the end of a long process of socialization that began early in childhood and most likely has its origins in the family. Parke and Bhavnagri (1989) indicated that parents influence children's peer experiences in two general ways. During elementary school parents propel their children toward certain peers by managing their youngsters' social activities (which has the effect of increasing contact with some peers and diminishing it with others); during both childhood and adolescence, parents actively steer children toward certain friends and away from others. In addition, throughout the child's development parents indirectly influence the child's attitudes, values, personality, and motives, which in turn affect the child's interactions and affiliations with particular peers (Brown et al., 1993). For all of these reasons, parental and peer influence tend to be complementary, not antithetical (Brown, 1990).

Finally, and perhaps most importantly, adolescents differ considerably in their susceptibility to peer influence, and one of the most important contributors to this differential susceptibility is the quality of the parent-child relationship. Adolescents whose parents are authoritative (i.e., responsive and demanding) are less swayed by peer pressure to misbehave than are adolescents whose parents are permissive (Devereux, 1970) or authoritarian (Fuligni & Eccles, 1993). Indeed, adolescents from authoritative homes are more susceptible to prosocial peer pressure (e.g., pressure to do well in school) but less susceptible to antisocial peer pressure (e.g., pressure to use illicit drugs and alcohol; Mounts & Steinberg, 1995). In other words, the particular peers a youngster selects as friends and the extent to which he or she is susceptible to their influence are both affected by parenting.

A compelling illustration of indirect effects of parents comes from research on the development of antisocial behavior and aggression (DeBaryshe, Patterson, & Capaldi, 1993; Dishion et al., 1991; Patterson, DeBaryshe, & Ramsey, 1989). Researchers consistently have confirmed that adolescents' involvement in antisocial activity is influenced significantly by their relationships with antisocial peers but that the chain of events that leads some adolescents into antisocial peer groups begins at home during childhood. The links in this chain include exposure to harsh and coercive parenting, which contributes to the development of aggression and to academic difficulties in school;

these problems, in late childhood, lead to the selection of antisocial peers. Even when selection effects are controlled, much of what appears to be peer influence is actually the end result of familial influence at an earlier point in the child's development.

Macrocontexts of parenting. Parents also mediate the association between broader social, cultural, economic, and historical contexts and children's behavior and personality. These broad contextual forces affect how parents behave and may accentuate or attenuate the effect of parental behavior on children's development. R. Conger (e.g., R. Conger et al., 1994) and McLoyd (1990), for example, have demonstrated that many of the deleterious effects of poverty on children's development are mediated through the effect of poverty on parenting; economic stress and disadvantage increase parental punitiveness, which in turn adversely affects the child. One implication of this for understanding the results of research on parenting is that estimates of the strength of parental influence are likely specific to particular communities in particular cultures at particular points in time. Many apparent "effects" of social class or economic disadvantage are mediated through the effect of these factors on parenting practices.

An example comes from recent research on the effects of neighborhood contexts on children's behavior and personality (Brooks-Gunn, Duncan, & Aber, 1997; Brooks-Gunn, Duncan, Klebanov, & Sealander, 1993; Chase-Lansdale & Gordon, 1996). Neighborhood characteristics have been shown both to influence parents' behavior and to moderate the effect of parenting practices on the child's development (Klebanov, Brooks-Gunn, & Duncan, 1994). The effect of neighborhoods on parental practices is evident in the finding that parents adjust their management strategies to suit the demands of the neighborhood context within which they live (Furstenberg, Eccles, Elder, Cook, & Sameroff, 1997). Parents who live in dangerous neighborhoods tend to be more controlling and restrictive, which protects the child's physical well-being but which also may have the unintended consequence of squelching the child's sense of autonomy. With respect to moderating effects, Darling and Steinberg (1997) have shown that the links between parental involvement in school and children's achievement vary as a function of the behavior of other parents in the neighborhood, with parental involvement having more potent effects within neighborhoods with high concentrations of involved parents. Similarly, the beneficial effects of authoritative parenting are accentuated when adolescents affiliate with peers who themselves have authoritative parents (Fletcher, Darling, Steinberg, & Dornbusch, 1995).

The documented relations between parental and other influences are consistent with recent criticisms (e.g., Harris, 1995, 1998) that socialization researchers have overemphasized the role of parents and underemphasized the role of nonfamilial influences, most notably, the peer group. Studies of the broader context of parental socialization, however, neither support nor refute claims about the potency of parental influence. These studies do amply illustrate that,

far from a myopic focus on the influence of parents, contemporary researchers have for some time amassed evidence that socialization can be fully understood only by examining the role of parents in light of the influence of other settings in which children and families function.

Conclusions

The lines of research just described imply a concept of parenting and parental influence that is more differentiated and complex than the dominant models of earlier eras. Whereas socialization researchers often depicted parents as "molding" children to function adequately in the society (Hartup, 1989; Maccoby, 1992), contemporary evidence clearly points toward multiple roles for parents that often do not imply the deterministic effect once attributed to them. Whereas researchers using behavior-genetic paradigms imply determinism by heredity and correspondingly little parental influence (e.g., Rowe, 1994), contemporary evidence confirms that the expression of heritable traits depends, often strongly, on experience, including specific parental behaviors, as well as predispositions and age-related factors in the child. Whereas both older traditions typically limited ideas about environmental effects to parents, contemporary researchers have shown the interrelated effects of parenting, nonfamilial influences, and the role of the broader context in which families live (e.g., Bronfenbrenner, 1979; Bronfenbrenner & Ceci, 1994; Brooks-Gunn et al., 1997; Darling & Steinberg, 1997; Wachs, 1999).

This new generation of evidence on the role of parenting should add to the conviction, long held by many scholars, that broad, general main effects for either heredity or environment are unlikely in research on behavior and personality. Statistical interactions and moderator effects are the rule, not the exception. Information of this kind, unfortunately, fits poorly with the desire of the popular media for facile sound bites about parenting or the yearning of some writers of introductory textbooks for general, causal statements about behavioral development. Contrary to criticisms of socialization research, the difficulty today is not that the evidence is inadequate to show parenting effects but that the evidence has revealed a reality that is far more complex than critics expected or that writers can convey in most popular media outlets. For psychologists, the challenge is to make that reality a compelling foundation for the science and practice of the future and to find ways of disseminating this knowledge to a public eager to understand the forces that shape children's development.

REFERENCES

- Abelson, R. (1985). A variance explanation paradox: When a little is a lot. *Psychological Bulletin*, *97*, 129-133.
- Angoff, W. H. (1988). The nature-nurture debate, aptitudes, and group differences. *American Psychologist*, *43*, 713-720.
- Anisman, H., Zaharia, M. D., Meaney, M. J., & Merali, Z. (1998). Do early-life events permanently alter behavioral and hormonal responses to stressors? *International Journal of Developmental Neuroscience*, *16*, 149-164.

- Bates, J., & Bayles, K. (1988). The role of attachment in the development of behavior problems. In J. Belsky & T. Nezworski (Eds.), *Clinical implications of attachment* (pp. 253–299). Hillsdale, NJ: Erlbaum.
- Bates, J., Bayles, K., Bennett, D. S., Ridge, B., & Brown, M. M. (1991). Origins of externalizing behavior problems at eight years of age. In E. J. Pepler & K. H. Rubin (Eds.), *The development and treatment of childhood aggression* (pp. 197–216). New York: Academic Press.
- Bates, J., Pettit, G., & Dodge, K. (1995). Family and child factors in stability and change in children's aggressiveness in elementary school. In J. McCord (Ed.), *Coercion and punishment in long-term perspectives* (pp. 124–138). New York: Cambridge University Press.
- Bates, J., Pettit, G., Dodge, K., & Ridge, B. (1998). Interaction of temperamental resistance to control and restrictive parenting in the development of externalizing behavior. *Developmental Psychology, 34*, 982–995.
- Bauman, K., & Fisher, L. (1986). On the measurement of friend behavior in research on friend influence and selection: Findings from longitudinal studies of adolescent smoking and drinking. *Journal of Youth and Adolescence, 15*, 345–353.
- Belsky, J., Goode, M. K., & Most, R. K. (1980). Maternal stimulation and infant exploratory competence: Cross-sectional, correlational, and experimental analyses. *Child Development, 51*, 1168–1178.
- Berndt, T. J. (1999). Friends' influence on children's adjustment to school. In W. A. Collins & B. Laursen (Eds.), *Relationships as developmental contexts: The Minnesota Symposia on Child Psychology* (Vol. 30, pp. 85–108). Mahwah, NJ: Erlbaum.
- Berndt, T. J., Hawkins, J. A., & Jiao, Z. (1999). Influence of friends and friendship on adjustment to junior high school. *Merrill-Palmer Quarterly, 45*, 13–41.
- Bohman, M. (1996). Predispositions to criminality: Swedish adoption studies in retrospect. In G. R. Bock & J. A. Goode (Eds.), *Genetics of criminal and antisocial behavior, Ciba Foundation Symposium 194* (pp. 99–114). Chichester, England: Wiley.
- Bornstein, M. H. (1989). Sensitive periods in development: Structural characteristics and causal interpretations. *Psychological Bulletin, 105*, 179–197.
- Bornstein, M. H. (1995a). Form and function: Implications for studies of culture and human development. *Culture and Psychology, 1*, 123–137.
- Bornstein, M. H. (Ed.). (1995b). *Handbook of parenting*. Mahwah, NJ: Erlbaum.
- Brody, G., & Stoneman, Z. (1994). Sibling relations and their association with parental differential treatment. In E. M. Hetherington, D. Reiss, & R. Plomin (Eds.), *Separate social worlds of siblings: The impact of nonshared environment on development* (pp. 129–142). Hillsdale, NJ: Erlbaum.
- Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.
- Bronfenbrenner, U., & Ceci, S. J. (1994). Nature–nurture reconceptualized in developmental perspective: A bioecological model. *Psychological Review, 101*, 568–586.
- Bronfenbrenner, U., & Morris, P. A. (1998). The ecology of developmental processes. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology: Theoretical models of human development* (5th ed., Vol. 1, pp. 993–1028). New York: Wiley.
- Brooks-Gunn, J., Duncan, G., & Aber, L. (Eds.). (1997). *Neighborhood poverty: Context and consequences for children*. New York: Russell Sage Foundation.
- Brooks-Gunn, J., Duncan, G., Klebanov, P., & Sealander, N. (1993). Do neighborhoods influence child and adolescent development? *American Journal of Sociology, 99*, 353–395.
- Brown, B. (1990). Peer groups. In S. Feldman & G. Elliott (Eds.), *At the threshold: The developing adolescent* (pp. 171–196). Cambridge, MA: Harvard University Press.
- Brown, B., Mounts, N., Lamborn, S., & Steinberg, L. (1993). Parenting practices and peer group affiliation in adolescence. *Child Development, 64*, 467–482.
- Cadoret, R. (1985). Genes, environment and their interaction in the development of psychopathology. In T. Sakai & T. Tsuboi (Eds.), *Genetic aspects of human development* (pp. 165–175). Tokyo: Igaku-Shoin.
- Cairns, R., & Cairns, B. (1994). *Lifelines and risks: Pathways of youth in our time*. New York: Cambridge University Press.
- Cairns, R., Cairns, B., Neckerman, H., Gest, S., & Garipey, J. L. (1988). Social networks and aggressive behavior: Peer support or peer rejection? *Developmental Psychology, 24*, 815–823.
- Caldji, C., Tannenbaum, B., Sharma, S., Francis, D., Plotsky, P. M., & Meaney, M. J. (1998). Maternal care during infancy regulates the development of neural systems mediating the expression of fearfulness in the rat. *Proceedings of the National Academy of Science, 95*, 5335–5340.
- Caspi, A., & Elder, G. (1988). Emergent family patterns: The intergenerational construction of problem behavior and relationships. *International Journal of Behavioral Development, 5*, 81–94.
- Caspi, A., Henry, B., McGee, R. O., Moffitt, T. E., & Silva, P. A. (1995). Temperamental origins of child and adolescent behavior problems: From age 3 to age 15. *Child Development, 66*, 55–68.
- Caspi, A., & Silva, P. (1995). Temperamental qualities at age 3 predict personality traits in young adulthood: Longitudinal evidence from a birth cohort. *Child Development, 66*, 486–498.
- Chase-Lansdale, P. L., Cherlin, A., & Kiernan, K. (1995). The long-term effects of parental divorce on the mental health of young adults: A developmental perspective. *Child Development, 66*, 1614–1634.
- Chase-Lansdale, P. L., & Gordon, R. A. (1996). Economic hardship and the development of five- and six-year-olds: Neighborhood and regional perspectives. *Child Development, 67*, 3338–3367.
- Chisholm, K. (1998). A three-year follow-up of attachment and indiscriminate friendliness in children adopted from Romanian orphanages. *Child Development, 69*, 1092–1106.
- Chisholm, K., Carter, M., Ames, E. W., & Morison, S. J. (1995). Attachment security and indiscriminately friendly behavior in children adopted from Romanian orphanages. *Development and Psychopathology, 7*, 283–294.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Conger, J. (1971). A world they never knew: The family and social change. *Daedalus, 100*, 1105–1138.
- Conger, R., & Elder, G. E. (1994). *Families in troubled times: Adapting to change in rural America*. New York: Aldine.
- Conger, R., Ge, X., Elder, G. H., Lorenz, F., & Simons, R. (1994). Economic stress, coercive family process and developmental problems of adolescents. *Child Development, 65*, 541–561.
- Cowan, P. A., & Cowan, C. P. (in press). What an intervention design reveals about how parents affect their children's academic achievement and social competence. In J. Borkowski, S. Landesman-Ramey, & M. Bristol (Eds.), *Parenting and the child's world: Multiple influences on intellectual and social-emotional development*. Hillsdale, NJ: Erlbaum.
- Cowan, P. A., Powell, D., & Cowan, C. P. (1998). Parenting interventions: A family systems perspective. In W. Damon, I. Sigel, & K. A. Renninger (Eds.), *Handbook of child psychology: Child psychology in practice* (Vol. 4, pp. 3–72). New York: Wiley.
- Darling, N., & Steinberg, L. (1997). Community influences on adolescent achievement and deviance. In J. Brooks-Gunn, G. Duncan, & L. Aber (Eds.), *Neighborhood poverty: Context and consequences for children: Conceptual, methodological, and policy approaches to studying neighborhoods* (Vol. 2, pp. 120–131). New York: Russell Sage Foundation.
- DeBaryshe, B., Patterson, G., & Capaldi, D. (1993). A performance model for academic achievement in early adolescent boys. *Developmental Psychology, 29*, 795–804.
- Devereux, E. C. (1970). The role of peer group experience in moral development. In J. P. Hill (Ed.), *Minnesota Symposia on Child Psychology* (Vol. 4, pp. 94–140). Minneapolis: University of Minnesota Press.
- Dishion, T., Patterson, G., Stoolmiller, M., & Skinner, M. (1991). Family, school, and behavioral antecedents to early adolescent involvement with antisocial peers. *Developmental Psychology, 27*, 172–180.
- Downey, G., & Walker, E. (1992). Distinguishing family-level and child-level influences on the development of depression and aggression. *Development and Psychopathology, 4*, 81–96.
- Dunn, J., & Plomin, R. (1986). Determinants of maternal behavior toward

- three-year-old siblings. *British Journal of Developmental Psychology*, 57, 348–356.
- Eisenberg, N., & Damon, W. (Eds.). (1998). *Handbook of child psychology: Social, emotional, and personality development* (Vol. 3). New York: Wiley.
- Emde, R., Plomin, R., Robinson, J., Corley, R., DeFries, J., Fulker, D., Reznick, J. S., Campos, J., Kagan, J., & Zahn-Waxler, C. (1992). Temperament, emotion, and cognition at fourteen months: The MacArthur longitudinal twin study. *Child Development*, 63, 1437–1455.
- Epstein, J. L. (1983). The influence of friends on achievement and affective outcomes. In J. L. Epstein & N. Karweit (Eds.), *Friends in school* (pp. 177–200). New York: Academic Press.
- Fletcher, A., Darling, N., Steinberg, L., & Dornbusch, S. (1995). The company they keep: Relation of adolescents' adjustment and behavior to their friends' perceptions of authoritative parenting in the social network. *Developmental Psychology*, 31, 300–310.
- Forehand, R., & King, H. E. (1977). Noncompliant children: Effects of parent training on behavior and attitude change. *Behavior Modification*, 1, 93–108.
- Forehand, R., Wells, K. C., & Griest, D. L. (1980). An examination of the social validity of a parent training program. *Behavior Therapy*, 11, 488–502.
- Forgatch, M. S. (1991). The clinical science vortex: A developing theory of antisocial behavior. In D. Pepler & K. Rubin (Eds.), *The development and treatment of childhood aggression* (pp. 291–315). Hillsdale, NJ: Erlbaum.
- Forgatch, M. S., & DeGarmo, D. S. (1999). Parenting through change: An effective prevention program for single mothers. *Journal of Consulting and Clinical Psychology*, 67, 711–724.
- Fulgini, A., & Eccles, J. (1993). Perceived parent-child relationships and early adolescents' orientation toward peers. *Developmental Psychology*, 29, 622–632.
- Furstenberg, F., Jr., Eccles, J., Elder, G., Jr., Cook, T., & Sameroff, A. (1997). *Managing to make it*. Chicago: University of Chicago Press.
- Gatz, M., Pedersen, N. L., Plomin, R., Nesselroade, J. R., & McLearn, G. E. (1992). Importance of shared genes and shared environments for symptoms of depression in older adults. *Journal of Abnormal Psychology*, 101, 701–708.
- Ge, X., Conger, R., Cadoret, R., Neiderhiser, J., Yates, W., Troughton, E., & Stewart, M. (1996). The developmental interface between nature and nurture: A mutual influence model of child antisocial behavior and parent behavior. *Developmental Psychology*, 32, 547–598.
- Ge, X., Conger, R., Lorenz, F., Shanahan, M., & Elder, G. (1995). Mutual influences in parent and adolescent psychological distress. *Developmental Psychology*, 31, 406–419.
- Ge, X., Lorenz, F., Conger, R., Elder, G., & Simons, R. (1994). Trajectories of stressful life events and depressive symptoms during adolescence. *Developmental Psychology*, 30, 467–483.
- Gesell, A., & Thompson, H. (1934). *Infant behavior: Its genesis and growth*. New York: McGraw-Hill.
- Ghodsion-Carpey, J., & Baker, L. A. (1997). Genetic and environmental influences on aggression in 4- to 7-year-old twins. *Aggressive Behavior*, 13, 173–186.
- Goldsmith, H., & Alansky, J. (1987). Maternal and infant temperamental predictors of attachment: A meta-analytic review. *Journal of Consulting and Clinical Psychology*, 55, 805–816.
- Goodman, R. (1991). Growing together and growing apart: The non-genetic forces on children in the same family. In R. McGuffin & R. Murry (Eds.), *The new genetics of mental illness* (pp. 212–224). Oxford, England: Oxford University Press.
- Greenough, W., & Black, J. (1992). Induction of brain structure by experience: Substrates for cognitive development. In M. R. Gunnar & C. A. Nelson (Eds.), *Developmental neuroscience: Minnesota Symposia on Child Psychology* (Vol. 24, pp. 155–200). Hillsdale, NJ: Erlbaum.
- Grossmann, K., Grossman, K., Spangler, G., Suess, G., & Unzner, L. (1985). Maternal sensitivity and newborns' orientation responses as related to quality of attachment in Northern Germany. *Monographs of the Society for Research in Child Development*, 50(1–2, Serial No. 209), 233–256.
- Gunnar, M. (in press). Early adversity and the development of stress reactivity and regulation. In C. A. Nelson (Ed.), *The effects of adversity on neurobehavioral development: Minnesota Symposia on Child Psychology* (Vol. 31). Mahwah, NJ: Erlbaum.
- Hagekull, B. (1989). Longitudinal stability of temperament within a behavioral style framework. In G. A. Kohnstamm, J. E. Bates, & M. K. Rothbart (Eds.), *Temperament in childhood* (pp. 283–297). Chichester, England: Wiley.
- Hagekull, B. (1994). Infant temperament and early childhood functioning: Possible relations to the five-factor model. In C. J. Halverson, Jr., G. A. Kohnstamm, & R. P. Martin (Eds.), *The developing structure of temperament and personality* (pp. 227–240). Hillsdale, NJ: Erlbaum.
- Hardy-Brown, K. (1983). Universals in individual differences: Disentangling two approaches to the study of language acquisition. *Developmental Psychology*, 19, 610–624.
- Hardy-Brown, K., & Plomin, R. (1985). Infant communicative development: Evidence from adoptive and biological families for genetic and environmental influences on rate differences. *Developmental Psychology*, 21, 378–385.
- Hardy-Brown, K., Plomin, R., & DeFries, J. C. (1981). Genetic and environmental influences on rate of communicative development in the first year of life. *Developmental Psychology*, 17, 704–717.
- Harris, J. R. (1995). Where is the child's environment? A group socialization theory of development. *Psychological Review*, 102, 458–489.
- Harris, J. R. (1998). *The nurture assumption: Why children turn out the way they do*. New York: Free Press.
- Hartup, W. W. (1989). Social relationships and their developmental significance. *American Psychologist*, 44, 120–126.
- Hetherington, E. M. (1989). Coping with family transitions: Winners, losers, and survivors. *Child Development*, 60, 1–14.
- Hetherington, E. M. (1991). The role of individual differences in family relations in coping with divorce and remarriage. In P. Cowan & E. M. Hetherington (Eds.), *Advances in family research: Family transitions* (Vol. 2, pp. 165–194). Hillsdale, NJ: Erlbaum.
- Hetherington, E. M. (1993). A review of the Virginia Longitudinal Study of Divorce and Remarriage: A focus on early adolescence. *Journal of Family Psychology*, 7, 39–56.
- Hoffman, L. W. (1991). The influence of the family environment on personality: Accounting for sibling differences. *Psychological Bulletin*, 110, 187–203.
- Hogue, A., & Steinberg, L. (1995). Homophily of internalized distress in adolescent peer groups. *Developmental Psychology*, 31, 897–906.
- Holden, G. W., & Miller, P. C. (1999). Enduring and different: A meta-analysis of the similarity in parents' child rearing. *Psychological Bulletin*, 125, 223–254.
- Huttenlocher, P. R. (1994). Synaptogenesis, synapse elimination, and neural plasticity in human cerebral cortex. In C. A. Nelson (Eds.), *Minnesota Symposia on Child Psychology: Threats to optimal development: Integrating biological, psychological, and social risk factors* (Vol. 27, pp. 35–54). Hillsdale, NJ: Erlbaum.
- Kandel, D. (1978). Homophily, selection, and socialization in adolescent friendships. *American Journal of Sociology*, 84, 427–436.
- Kim, J. E., Hetherington, E. M., & Reiss, D. (1999). Associations between family relationships, antisocial peers and adolescent's externalizing behaviors: Gender and family type differences. *Child Development*, 70, 1209–1230.
- Klebanov, P. K., Brooks-Gunn, J., & Duncan, G. T. (1994). Does neighborhood and family poverty affect mothers' parenting, mental health and social support? *Journal of Marriage and the Family*, 56, 441–455.
- Kochanska, G. (1995). Children's temperament, mothers' discipline, and the security of attachment: Multiple pathways to emerging internalization. *Child Development*, 66, 597–615.
- Kochanska, G. (1997). Multiple pathways to conscience for children with different temperaments: From toddlerhood to age 5. *Developmental Psychology*, 33, 228–240.
- Kuczynski, L. (1984). Socialization goals and mother-child interaction: Strategies for long-term and short-term compliance. *Developmental Psychology*, 20, 1061–1073.

- Lee, C. L., & Bates, J. (1985). Mother-child interaction at age two years and perceived difficult temperament. *Child Development, 56*, 1314-1325.
- Lewis, M. (1997). *Altering fate: Why the past does not predict the future*. New York: Guilford Press.
- Liu, D., Diorio, J., Tannenbaum, B., Caldji, C., Francis, D., Freedman, M. A., Sharma, S., Pearson, P., Plotsky, P. M., & Meaney, M. J. (1997, September 12). Maternal care, hippocampal glucocorticoid receptors and hypothalamic-pituitary-adrenal responses to stress. *Science, 277*, 1659-1662.
- Maccoby, E. E. (1992). The role of parents in the socialization of children: An historical overview. *Developmental Psychology, 28*, 1006-1017.
- McCall, R. (1991). So many interactions, so little evidence: Why? In T. Wachs & R. Plomin (Eds.), *Conceptualization and measurement of organism-environment interaction* (pp. 142-161). Washington, DC: American Psychological Association.
- McCartney, K., Harris, M., & Bernieri, F. (1990). Growing up and growing apart: A developmental meta-analysis of twin studies. *Psychological Bulletin, 107*, 226-237.
- McClelland, G., & Judd, C. (1993). Statistical difficulties of detecting interactions and moderator effects. *Psychological Bulletin, 114*, 376-390.
- McGue, M. (1994). Genes, environment, and the etiology of alcoholism. In R. Zucker, G. Boyd, & J. Howard (Eds.), *The development of alcohol problems: Exploring the biopsychosocial matrix of risk* (National Institute of Alcohol Abuse and Alcoholism Research Monograph No. 26, pp. 1-40). Rockville, MD: U.S. Department of Health and Human Services.
- McLoyd, V. (1990). The impact of economic hardship on Black families and children: Psychological distress, parenting, and socioemotional development. *Child Development, 61*, 311-346.
- McMahon, R. J., & Wells, K. C. (1998). Conduct problems. In E. J. Mash & R. A. Barkley (Eds.), *Treatment of childhood disorders* (2nd ed., pp. 111-151). New York: Guilford Press.
- Miles, D., & Carey, G. (1997). Genetic and environmental architecture of human aggression. *Journal of Personality and Social Psychology, 72*, 207-217.
- Miyake, K., Chen, S.-J., & Campos, J. (1985). Infant temperament, mother's mode of interaction, and attachment in Japan: An interim report. *Monographs of the Society for Research in Child Development, 50* (1-2, Serial No. 209), 276-297.
- Mounts, N., & Steinberg, L. (1995). An ecological analysis of peer influence on adolescent grade point average and drug use. *Developmental Psychology, 31*, 915-922.
- Nelson, C. A. (in press). The neurobiological bases of early intervention. In S. J. Meisels & J. P. Shonkoff (Eds.), *Handbook of early childhood intervention* (2nd ed.). New York: Cambridge University Press.
- O'Connor, T. G., Deater-Deckard, K., Fulker, D., Rutter, M. L., & Plomin, R. (1998). Genotype-environment correlations in late childhood and early adolescence: Antisocial behavioral problems and coercive parenting. *Developmental Psychology, 34*, 970-981.
- Parke, R., & Bhavnagri, N. P. (1989). Parents as managers of children's peer relationships. In D. Belle (Ed.), *Children's social networks and social support* (pp. 241-259). New York: Wiley.
- Patterson, G. R. (1975). Multiple evaluations of a parent-training program. In T. Thompson & W. S. Dockens (Eds.), *Applications of behavior modification* (pp. 299-322). New York: Academic Press.
- Patterson, G. R. (1999). *Recent news concerning the demise of parenting may be a bit premature*. Unpublished manuscript, Oregon Social Learning Center, Eugene, OR.
- Patterson, G. R., DeBaryshe, B. D., & Ramsey, E. (1989). A developmental perspective on antisocial behavior. *American Psychologist, 44*, 329-335.
- Plomin, R. (1990). *Nature and nurture: An introduction to human behavioral genetics*. Pacific Grove, CA: Brooks/Cole.
- Plomin, R., & Daniels, D. (1987). Why are children in the same family so different from each other? *Behavioral and Brain Sciences, 10*, 1-16.
- Plomin, R., DeFries, J., & Fulker, D. (1988). *Nature and nurture during infancy and early childhood*. New York: Cambridge University Press.
- Plomin, R., & Rutter, M. (1998). Child development, molecular genetics, and what to do with genes once they are found. *Child Development, 69*, 1223-1242.
- Quinton, D., Pickles, A., Maughan, B., & Rutter, M. (1993). Partners, peers, and pathways: Assortative pairing and continuities in conduct disorder. *Development and Psychopathology, 5*, 763-783.
- Reiss, D., Niederhiser, J., Hetherington, E. M., & Plomin, R. (in press). *The relationship code: Deciphering genetic and social patterns in adolescent development*. Cambridge, MA: Harvard University Press.
- Riksen-Walraven, J. (1978). Effects of caregiver behavior on habituation rate and self-efficacy in infants. *International Journal of Behavioral Development, 1*, 105-130.
- Rose, R. (1995). Genes and human behavior. *Annual Review of Psychology, 46*, 625-654.
- Rothbart, M., & Ahadi, S. (1994). Temperament and the development of personality. *Journal of Abnormal Psychology, 103*, 55-66.
- Rothbart, M., & Bates, J. (1998). Temperament. In W. Damon & N. Eisenberg (Eds.), *Handbook of child psychology: Social, emotional, and personality development* (Vol. 3, pp. 105-176). New York: Wiley.
- Rowe, D. (1983). A biometrical analysis of perceptions of family environment: A study of twin and singleton sibling kinship. *Child Development, 54*, 416-423.
- Rowe, D. (1994). *The limits of family influence: Genes, experience, and behavior*. New York: Guilford Press.
- Rowe, D., Chassin, L., Presson, C., Edwards, D., & Sherman, S. J. (1992). An "epidemic" model of adolescent cigarette smoking. *Journal of Applied Social Psychology, 22*, 261-285.
- Rutter, M. (1990). Psychosocial resilience and protective mechanisms. In J. Rolf, A. S. Masten, D. Cicchetti, K. H. Nuechterlein, & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology* (pp. 181-214). New York: Cambridge University Press.
- Rutter, M., Dunn, J., Plomin, R., Simonoff, E., Pickles, A., Maughan, B., Ormel, H., Meyer, J., & Eaves, L. (1997). Integrating nature and nurture: Implications of person-environment correlations and interactions for developmental psychopathology. *Development and Psychopathology, 9*, 335-364.
- Rutter, M., & the English and Romanian Adoptees (ERA) study team. (1998). Developmental catch-up, and deficit, following adoption after severe global early privation. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 39*, 465-476.
- Rutter, M., & Quinton, D. (1984). Parental psychiatric disorder: Effects on children. *Psychological Medicine, 14*, 853-880.
- Scarr, S., & Weinberg, R. A. (1976). IQ test performance of Black children adopted by White families. *American Psychologist, 31*, 726-739.
- Scarr, S., & Weinberg, R. A. (1978). The influence of "family background" on intellectual attainment. *American Sociological Review, 43*, 674-692.
- Schiff, M., Duyme, M., Dumaret, A., & Tomkiewitz, S. (1982). How much could we boost scholastic achievement and IQ scores? A direct answer from a French adoption study. *Cognition, 12*, 165-196.
- Skodak, M., & Skeels, H. (1949). A final follow-up of one hundred adopted children. *Journal of Genetic Psychology, 75*, 85-125.
- Steinberg, L., Lamborn, S., Darling, N., Mounts, N., & Dornbusch, S. (1994). Over-time changes in adjustment and competence among adolescents from authoritative, authoritarian, indulgent, and neglectful families. *Child Development, 65*, 754-770.
- Stern, D. N. (1985). *The interpersonal world of the infant*. New York: Basic Books.
- Stoolmiller, M. (1999). Implications of the restricted range of family environments for estimates of heritability and nonshared environment in behavior-genetic adoption studies. *Psychological Bulletin, 125*, 392-409.
- Suomi, S. J. (1997). Long-term effects of different early rearing experiences on social, emotional and physiological development in nonhuman primates. In M. S. Kesheven & R. M. Murra (Eds.), *Neurodevelopmental models of adult psychopathology* (pp. 104-116). Cambridge, England: Cambridge University Press.
- Suomi, S. J. (in press). A biobehavioral perspective on developmental psychopathology: Excessive aggression and serotonergic dysfunction in monkeys. In A. J. Sameroff, M. Lewis, & S. Miller (Eds.), *Handbook of developmental psychopathology*. New York: Plenum.

- Tejerina-Allen, M., Wagner, B. M., & Cohen, P. (1994). A comparison of across-family and within-family parenting predictors of adolescent psychopathology and suicidal ideation. In E. M. Hetherington, D. Reiss, & R. Plomin (Eds.), *Separate social worlds of siblings: The impact of nonshared environment on development* (pp. 143–158). Hillsdale, NJ: Erlbaum.
- Tienari, P., Wynne, L. C., Moring, J., Lahti, I., Naarala, M., Sorri, A., Wahlberg, K.-E., Saarento, O., Seitma, M., Kaleva, M., & Lasky, K. (1994). The Finnish adoptive family study of schizophrenia: Implications for family research. *British Journal of Psychiatry*, 23(Suppl. 164), 20–26.
- Turkheimer, E., & Waldron, M. C. (in press). Nonshared environment: A theoretical, methodological, and quantitative review. *Psychological Bulletin*.
- Van den Boom, D. C. (1989). Neonatal irritability and the development of attachment. In G. A. Kohnstamm, J. E. Bates, & M. K. Rothbart (Eds.), *Temperament in childhood* (pp. 299–318). Chichester, England: Wiley.
- Van den Boom, D. C. (1994). The influence of temperament and mothering on attachment and exploration: An experimental manipulation of sensitive responsiveness among lower-class mothers with irritable infants. *Child Development*, 65, 1457–1477.
- Wachs, T. D. (1992). *The nature of nurture*. Newbury Park, CA: Sage.
- Wachs, T. D. (1999). Celebrating complexity: Conceptualization and assessment of the environment. In S. Friedman & T. D. Wachs (Eds.), *Measuring environment across the life span: Emerging methods and concepts* (pp. 357–392). Washington, DC: American Psychological Association.
- Wachs, T. D., & Plomin, R. (1991). *Conceptualization and measurement of organism–environment interaction*. Washington, DC: American Psychological Association.
- Wahlsten, D. (1990). Insensitivity of the analysis of variance to heredity–environment interaction. *Behavior and Brain Sciences*, 13, 109–161.
- Weinberg, R. A. (1989). Intelligence and IQ: Landmark issues and great debates. *American Psychologist*, 44, 98–104.
- Werner, E. (1990). Protective factors and individual resilience. In S. Meisels & J. Shonkoff (Eds.), *Handbook of early childhood intervention* (pp. 97–116). Cambridge, MA: Harvard University Press.
- Werner, E., & Smith, R. (1992). *Overcoming the odds: High risk children from birth to adulthood*. Ithaca, NY: Cornell University Press.
- Zill, N., Morrison, D., & Coiro, M. (1993). Long-term effects of parental divorce on parent–child relationships, adjustment, and achievement in young adulthood. *Journal of Family Psychology*, 7, 91–103.

Notice of Clarification re: Field Publications on Touch Therapy

Readers should note that some of the content of the article “Massage Therapy Effects,” by Tiffany M. Field (*American Psychologist*, 1998, Vol. 53, No. 12, pp. 1270–1281), was published in “Touch Therapies,” by Tiffany M. Field (in R. R. Hoffman, M. F. Sherrick, & J. S. Warm, Eds., *Viewing Psychology as a Whole: The Integrative Science of William N. Dember*, 1998, pp. 603–624, Washington, DC: American Psychological Association). There is also some overlap with a journal article: “Touch Therapy Effects on Development,” by Tiffany M. Field (*International Journal of Behavioral Development*, 1998, Vol. 22, No. 4, pp. 779–797).
