Development and Psychopathology, **15** (2003), 909–926
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Printed in the United States of America
DOI: 10.1017.S0954579403000427

Adoption as a natural experiment

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Abstract
Adoption provides a unique opportunity for the study of child development. Because adopted children are raised in families in which they have no genetic relationship with their parents, and possibly none with their siblings, they provide a rare opportunity to study the relative importance of genetic, shared environmental, and nonshared environmental influences on the development of child characteristics and behaviors. Because children are adopted from a variety of circumstances and at a wide range of ages, studies of adopted children and their families provide researchers the opportunity to examine the short- and long-term influences of a wide range of environments on children's development. Because children are adopted into homes with a range of characteristics (e.g., multiracial homes), adoption provides the opportunity to study the range of influences of these homes on child development. Adoption research that focuses on each of these areas is reviewed in this article. We present conclusions about the value of adoption in psychological research and some reasons why many psychologists ignore the opportunities presented by studying adoptive families, as well as potential useful directions for future research with adopted children and their families.

Almost all children are raised by their birth parents[1] or by other close relatives. As a result, most children share genes with the people who are largely responsible for creating the environments in which they are raised. Consequently, distinguishing the genetic and environmental influences on a particular child's development is often difficult, since those influences are commingled in ways that are difficult to disentangle. In addition, although many children experience significant changes in their environments and family life (e.g., moving to a new neighborhood or school, the divorce or remarriage of their parents), these changes usually occur in the context of significant stability (e.g., they continue to live with their families when moving to a new school or neighborhood, or they continue to live with one parent and their siblings following their parents' divorce). This can make it difficult to estimate the relative influences of the changes and the sources of stability on a child's development.

For obvious reasons, researchers are not allowed to place children in environments where they have no genetic relationship to those around them in order to disentangle the relative influence of genes and environment on their development or remove children from one environment and place them in a completely new one to see how the differences in the environments influence their development. However, a small percentage of children are moved from one environment to a new one and are separated from their genetic relatives through legal procedures, that is, children who are adopted. Consequently, these children and their birth and adoptive families provide a unique opportunity to examine a variety of issues in child development through an *experiment of nature* (or, at least of our social and legal systems) through which children's lives are rearranged and they are sent to live with adults who have no genetic rela-

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1. In the adoption field, the term *birth parent* is commonly used to denote a child's genetic parent.

https://doi.org/10.1017/S0954579403000427 Published online by Cambridge University Press

tionship to them. This article explores several ways in which research with adopted children can provide direct information about child development that is not available from other sources.

Most studies involving adopted children fall into one of two broad categories. The first includes those that explore the relative degree to which physical and psychiatric disorders, personal characteristics, or behaviors are influenced by genetic and environmental factors. The focus of this research is not on the adoption process; rather, researchers use adoption for disentangling genetic and environmental influences. The second category focuses on the adoption process and explores the outcomes of adoption. As well as exploring the adoption process, these studies can be used to address a variety of issues related to child development.

Adoption in the United States

The number of infants adopted by nonrelatives in the United States each year has been estimated at 30,000–40,000, although the actual number is unknown because there is no national repository of adoption data (Goodman, Emery, & Haugaard, 1998). (About 60% of legal adoptions are by relatives, mostly stepparents, and these adoptions are not included in adoption research because they are essentially studies of remarried families.) Approximately 14,000 older and special-needs children are adopted in the United States each year, and an additional 14,000 older or special-needs children each year are freed for and awaiting adoption (Barth & Beery, 1988; National Committee for Adoption, 1989; Rosenthal & Groze, 1990). (Special-needs adoptions are those involving children for whom finding adoptive families is relatively hard, such as children with physical disabilities or serious medical conditions, children who are older than toddlers, and children who are part of sibling groups. The laws of most states require that sibling groups be placed in adoptive homes together when possible.) Most of the children adopted in the United States are born there, although a rapidly increasing number come from other countries (McGuinnes & Pallansch, 2000). For example, in 2002, the U.S. State Department issued about 20,000 visas for orphans from other countries to enter the United States for adoption, which compares to about 10,000 visas issued to orphans in 1996 (U.S. State Dept., 2002). Countries from which the most children come currently are China and Russia (each with about 5,000/year), Guatemala, South Korea, and the Ukraine.

Considerable heterogeneity exists within the group of adopted children. Keeping this heterogeneity in mind when reviewing adoption research is important, because adopted children with certain characteristics or who have had certain experiences before their adoption may be very different from those with other characteristics or experiences. The age at which children are adopted varies considerably, and the preadoption experiences of children are strongly associated with this factor. For example, children adopted as newborns are likely to experience quite different circumstances during their early years than children adopted during their school-age years, who may have endured years of abuse in their birth family and years of foster-care placement. Even when adopted children are grouped by the developmental stage during which they were adopted, considerable intragroup heterogeneity can exist. For example, many studies distinguish between children adopted as infants and those adopted in childhood; however, the age used to define infancy has not been consistent between studies. *Children adopted in infancy* can include those adopted just a few days after birth and those adopted after having been with a birth parent or foster parent for a year. Because these older infants are likely to have had an attachment relationship interrupted as the result of adoption (Bowlby, 1969), their experience of adoption is likely to be quite different from that of infants adopted before any attachment with a primary caregiver has formed. Finally, there can be considerable heterogeneity even among those adopted at the same age. For example, the dramatic increase in the number of newborns harmed by their mother's drug use during pregnancy has resulted in an increase in drug-exposed newborns and infants who are eligible for adoption (Haugaard, 1998a). Clear-

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ly, these newborns' preadoptive environments are substantially different from adopted newborns who developed in a healthy environment.

The heterogeneity among adopted children requires that care be used when designing and interpreting adoption research. Studies that combine children adopted during infancy with those adopted later in life or studies that combine infants adopted from mothers who provided a good prenatal environment with infants adopted from mothers who provided a poor prenatal environment are likely to provide little information that accurately describes the children in any of the subgroups within the overall sample. For example, estimates of risk for psychopathology derived from a sample that combines children adopted in infancy and children adopted at an older age are likely to overestimate the risk for the children adopted as infants and underestimate the risk to children adopted when older (Haugaard, 1998b). Consequently, a clear understanding of the sample in any adoption research is necessary before the results of the research can be interpreted accurately.

Using Adopted Samples to Estimate Genetic and Environmental Influences on Characteristics and Behaviors

The field of study known as behavior genetics focuses on developing a better understanding of the genetic and environmental influences on behavior. An important strategy for behavior genetic research involves the use of samples of adopted children and adults. The focus of this research is not the factors that facilitate or hinder adjustment of individuals to their adoptive families. Rather, the aim is to use adoptive families to distinguish the relative importance of genes and the environment on development.

The logic of behavior genetics research is as follows: individual differences in traits or behaviors can result from genetic or environmental influences. If genes have an important influence on some characteristic or behavior, then individuals who are genetically related should be more similar than those who are less closely related or unrelated. If environmental factors have an important influence on some characteristic or behavior, then individuals reared in the same environment should be more similar than those reared in different environments (Plomin, DeFries, McClearn, & Rutter, 1997).

The traditional approach to investigating the influence of different environments has been to compare children from different families (Plomin et al., 1997). For example, children from wealthy families could be compared with children from low-income families to explore the influence of family income on several children's developmental outcomes. This strategy presumes that children reared in the same home by the same parents have grown up in equivalent environments, that is, all the environmental influences in a home are "shared" by all the children raised in that home. However, this turns out not to be the case, as their experiences both inside and outside the home differ considerably and have measurable influences on personality and other important outcomes. Ironically, behavior geneticists detected an important source of environmental influence, referred to as *nonshared environment*. In essence, nonshared environment represents the variability in traits or behaviors that can be attributed to environmental factors operating to make children living in the same household different from each other (Plomin, DeFries, McClearn, & McGuffin, 2001). Nonshared environment includes factors such as parents treating their children differently, children perceiving that they are treated differently by their parents, siblings treating each other differently, and so on (Plomin & Daniels, 1987). Therefore, a better approach for understanding shared and nonshared environmental influences is to study children within each family.

Two useful strategies in behavior genetics research involve studying twins and their families and adopted individuals and their families. Both strategies create opportunities to distinguish genetic from environmental influences on the development of traits and behaviors. One common approach in twin research is to compare the similarity of a trait or behavior between monozygotic (MZ) twins, who share 100% of their genes, and dizygotic (DZ) twins or nontwin siblings, who, on average,

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share only 50% of their genes. If there is more similarity between MZ twins than DZ twins or nontwin siblings, it is taken as evidence of a genetic influence on that trait or behavior. Another strategy with twins is to compare the similarity of a trait or behaviors between MZ twins reared together and MZ twins reared apart. Presumably, any similarities between MZ twins reared separately are due to shared genes.

Families that have adopted infants provide another good opportunity for behavior genetics research, especially when information about members of the birth family is available. For example, a finding of greater similarity on some trait or behavior between the adopted child and the birth mother (compared with the adoptive mother) would indicate a genetic influence; the opposite finding of greater similarity with the adoptive mother would suggest an environmental influence. Another strategy is to compare biological siblings with an adopted child being raised in the same home. If genes are important for a given trait or behavior, then biological siblings should be more similar to each other than to their adoptive siblings, and so on.

Behavior genetics has been criticized on several grounds (e.g., Bronfenbrenner & Ceci, 1994). For example, because the heritability of a trait is the ratio of genotypic to phenotypic variance, estimates of genetic influence differ, depending on how heterogeneous or homogeneous a sample is. Also, for twins reared apart, it is assumed that their environments are uncorrelated; however, criteria for screening potential adoptive families may result in the twins being adopted by families with similar characteristics, thus making their environments similar along many dimensions. This same concern could be raised in studies of adoptive families: because adoptive families are selected using criteria hypothesized to be related to successful family life, adopted children may come from a more heterogeneous set of family environments and be placed in a more homogeneous group of families. Over the past 20 years, however, families with a wider range of characteristics have been allowed to adopt children, which may reduce this concern in adoption studies conducted now (Goodman et al., 1998). It should also be noted that, at their best, heritability estimates tell us how much of a trait is due to genes but tell us nothing about the underlying mechanisms that might account for the association.

Most twin and adoption studies have found evidence of a significant genetic contribution to personality, intelligence, and psychopathology (Bouchard, Lykken, McGue, Segal, & Tellegen, 1990). In personality research, most components of personality are influenced moderately by genes (about 40%), with the rest of the influence coming from nonshared environment (the influence of shared environment usually ranges from 0 to 5%; Plomin et al., 2001). For example, a considerable amount of work has focused on the personality traits of extraversion and neuroticism (Costa & McCrae, 1994). From a large study of adolescents, Loehlin (1992) reported on correlations from adoptive and nonadoptive families. For extraversion and neuroticism, the correlation between nonadoptive parents and their children was .16 and .13, respectively; between adoptive parents and their adopted children, it was .01 and .05, respectively. Correlations between nonadoptive siblings were .20 and .09, respectively, and between adoptive siblings, −.07 and .11, respectively. As can be seen, personality is much more correlated within nonadoptive homes than adoptive homes, indicating the influence of genes on personality.

Schizophrenia is the form of psychopathology that has received the most attention from behavior geneticists. Two studies of Danish adopted children showed a strong genetic influence for schizophrenia. Rosenthal, Wender, Kety, Welner, and Schulsinger (1971) found that 7% of children adopted from schizophrenic birth parents developed schizophrenia whereas 0% of those adopted from nonschizophrenic parents developed the disorder. Using another strategy and another sample of Danish children, Kety et al. (1994) found that 5% of adopted children who developed schizophrenia had a birth parent or birth sibling with schizophrenia whereas 0% of the adopted children with schizophrenia had an adoptive parent or sibling with schizophrenia. Adop-

https://doi.org/10.1017/S0954579403000427 Published online by Cambridge University Press

tion studies on mood disorders have provided equivocal results for major depression and some suggestion of the heritability of bipolar disorder (Plomin et al. 2001). Some recent studies of anxiety have provided equivocal results, and adoption studies have not focused on other disorders (Plomin et al., 2001). General cognitive ability has been investigated with a wide range of adoption and twin studies. Plomin et al. (2001) suggest that, as a group, these studies suggest that about 40% of children's intelligence is influenced by genes, 25% by shared environment, and 25% by unshared environment (with about 10% measurement error). This changes over the course of development, so that by adulthood about 60% of intelligence is influenced by genes, 0% by shared environment, and 35% by nonshared environment (with about 5% measurement error).

Of late, researchers have sought to explain why twin studies generally produce higher heritability estimates than adoption studies. Whether the discrepancy is evidence of nonadditive genetic effects that cannot be detected by adoption studies (Plomin, Corley, Caspi, Fulker, & DeFries, 1998) or an artifact of the restricted range of family environments in adoption studies (Stoolmiller, 1999), there is every indication that adoptive families will continue to be a valuable population for investigations aimed at sorting out the contributions of nature and nature to human development.

Exploring Nontraditional Families Through Studies of Nontraditional Adoptive Families

Throughout much of U.S. history, legal adoptions were made primarily or solely by heterosexual couples of childbearing age (Goodman et al., 1998). Over the past few decades, however, a more diverse group of individuals and couples have been allowed to adopt children. Some research is available about two of these less traditional parenting arrangements: parenting by single parents and by parents of a different race or ethnicity from the child. The outcomes of these adoptions provide glimpses of the extent to which parenting by people or couples with these characteristics can result in outcomes for children that are similar to those provided by more traditional couples. Of course, studies with adoptive families cannot be translated directly into information about the outcomes for children born into other types of families, because these children have genetic similarities to at least one of their parents and have not had the disruptive experience of changing parents. However, they can raise issues that might be addressed more systematically with children living in a wider range of family types.

Multiracial or multiethnic families

Adoptions can lead to multiracial or multiethnic families in two primary ways: through the adoption of a child of a different race or ethnicity within the same country (e.g., a European American family adopting an African American infant) or through an international adoption (e.g., a European American family adopting an infant from China). Although a large majority of Americans of all races approve of transracial adoption (Vonk, Simms, & Nackerud, 1999), it has been controversial for many decades. Most of this controversy has focused on the adoption of African American children into European American families. Transracial adoptions were rare before the 1950s, and several states had laws prohibiting them (Mini, 1994). In the mid-1960s, transracial adoptions increased when courts struck down laws prohibiting them. In addition, transracial adoptions became part of the movement toward social integration of the races (Glynn, 1993, *In re Gomez*, 1967). Transracial adoption came under sharp criticism by the National Association of Black Social Workers in 1972, which declared that transracial adoptions should be prohibited. Following this criticism, the policy of many adoption agencies was to avoid transracial adoptions, basically returning the situation to what it was before the 1960s. In the 1970s, some European American parents sued to adopt African American children who had been in their homes as foster children, bringing transracial adoption before the courts again. Although the Supreme Court has never ruled on

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this issue, lower courts have ruled that race cannot be the determining factor in an adoption or be given excessive weight in an adoption-placement decision (e.g., *Compos v. McKeithen*, 1972; *In re Moorehead*, 1991). Changes in federal law through the Multiethnic Placement Act of 1994 further increased the number of transracial and transethnic adoptions (Hollingsworth, 2000).

A series of studies has explored several aspects of the development of children raised in transracial or transethnic families. Some have examined the racial identity of minority group children adopted by European American families. A problem with this line of research, however, is that racial identity has not been operationalized in a consistent way. For example, McRoy, Zurcher, Lauderdale, and Anderson (1982) and Andujo (1988) used the Twenty-Statements Test to assess racial identity. The Twenty-Statements Test has the child respond 20 times to the question "Who am I?" McRoy et al. found that 30 African American children adopted by European American families referred to their race *more* frequently than 30 African American children adopted by African American families, and they interpreted this as meaning that the transracially adopted children had more conflict about their racial identity. Andujo, on the other hand, found that 30 Mexican American children adopted by European American families referred to themselves as Mexican American *less* frequently than 30 Mexican American children adopted by Mexican American families and interpreted this as indicating that the transethnically adopted children had a poorer general acceptance of their ethnicity. Because of this confusion, little information is available about the racial identify of transracially adopted children.

Some research has examined transracially adopted children's acceptance of their race or ethnicity. Shireman and Johnson (1985) gave the Clark Doll Test (in which children attribute various qualities to either a European American or an African American doll) to African American children adopted by either European American or African American families. At age 4, the transracially adopted children showed a greater preference for the African American dolls than the children adopted by African American families. By age 8, there were no differences in the preferences between the children adopted by European American or African American families. The authors interpreted this as suggesting that the transracially adopted children had as positive a view of their race as did the within-race adopted children.

The general self-esteem of transracially adopted children has also been explored. McRoy et al. (1982) found similar levels of self-esteem in African American children (average age of 13) adopted by African American and European American families as measured by the Tennessee Self-Concept Scale. Using the same test, Andujo (1988) found similar self-esteem levels with her two groups of adopted Mexican American children (average age of 14). Simon, Altstein, and Melli (1994) found no differences in self-esteem between African American children adopted by European American families, the European American birth children in the same adoptive families, or a separate group of European American children adopted by European American families, 12 years after their adoption. Bagley (1993) found no difference on several measures of self-esteem between African American children adopted by European American families and European American children adopted by European American families 12 years after their adoption. In addition, Bagley found no differences between the two groups of adoptees on several scales of psychological adjustment and educational achievement. The one study that has found a deficit in self-esteem focused on adolescents adopted from South America and Asia into Italian families. The average age at adoption was 4.3 years, and the adolescents completed several measures at an average age of 15 years. The internationally adopted adolescents scored lower on a self-esteem scale than did a group of adolescents from intact, nonadoptive families and another group of adolescents from divorced or separated nonadoptive families. Interestingly, a separate scale measuring quality of parent–child communication revealed that the adopted adolescents had a higher quality of communication with their parents than did

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the adolescents from the other groups. Parent–child communication was correlated with self-esteem in the two nonadoptive groups but not in the adopted group. The authors suggested that this suggested that, despite good relationships with their parents, the internationally adopted adolescents had self-esteem issues related to differences in physical appearance between themselves and their peers.

Single-parent families

No laws prohibit adoptions by single parents, and state appellate courts have overturned trial court rulings prohibiting adoptions by single parents (e.g., *In re Alison*, 1995; *Matter of Byron, K.*, 1994). However, the courts have also ruled that single-parent families are less desirable placements than dual-parent families and have awarded custody to dual-parent families in several cases in which the child had lived with the single parent as a foster child (*In re Infant*, 1972; *In re L.B.T.*, 1982). Although adoptions by single parents have increased over the past two decades (Shireman, 1995), they have traditionally been viewed by child welfare agencies as less desirable than placements in dual-parent families. Consequently, single parents are often only able to adopt children who are hard to place in dual-parent homes (Dougherty, 1978). These hard to place children are generally older, come from an ethnic minority, or have emotional or physical disabilities (Barth & Beery, 1988; Feigelman & Silverman, 1983; Groze & Rosenthal, 1991). Paradoxically, this has meant that the families seen by child welfare agencies as having the fewest resources are generally required to adopt children who have the greatest needs.

Almost all single adoptive parents are women, and, as a group, single adoptive parents have several characteristics that are different from adoptive couples (Dougherty, 1978; Feigelman & Silverman, 1983; Groze & Rosenthal, 1991). For example, single adoptive mothers tend to be about 5 years older and to have more education than mothers in adoptive couples. Many single adoptive parents are African American whereas most adoptive couples are European American. The family income in single-parent adoptive families is usually lower than in dual-parent adoptive families, due primarily to there being only one wage earner in the single-parent families.

Groze and Rosenthal (1991) compared single- and dual-parent families that had adopted a special-needs child at least 6 months before the study. The single parents reported fewer behavioral problems on the Child Behavior Checklist (CBCL; Achenbach, 1991) than did the couples. There was no difference between the two groups in parental reports of the children's school behavior or enjoyment of school. Feigelman and Silverman (1983) surveyed single- and dual-parent families 6 years after an adoptive placement. They found no significant differences between the single- and dual-parent families in parents' ratings of children's overall adjustment, the frequency of emotional problems, or levels of hyperactivity. Further, they found that the levels of role distress about adopting a child were similar between the single parents and couples. Shireman and Johnson (1985) followed several groups of mainly minority children adopted as infants from an agency in Chicago. Their results showed similar development among children adopted by single- and dual-parent families. Through self-report measures and interviews with 15 of the original 31 families when their child was age 15, Shireman (1988) concluded that identity formation, gender identity, and level of emotional and behavioral problems were similar for the children adopted by single parents and couples.

Summary and directions for future studies of nontraditional adoptive families

Research with nontraditional adoptive families suggests that children adopted into them do not experience the types of deficits that one would expect if being raised in these families presented obstacles to the development of children. These nontraditional families may present a variety of developmental challenges for children and parents, for example, issues of adoption and race undoubtedly occur more often when two European American parents and their two African American adopted children interact with others at school, church, or

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other social settings than they do for two European American parents and their two European American adopted children. However, it does not appear that these issues have a significant negative influence on the development of children adopted into these families.

Too often, in our view, adoption research with nontraditional families has been narrowly focused on the question of whether outcomes for the children in these families are "as good as" outcomes for children in more traditional families. This has been particularly true in the research on children being raised in multiracial or multiethnic families. A broader perspective that explored for similarities and differences of children raised in various types of families could inform developmental theory about the influences of parents and family life on the developing child. It might be, for example, that transracially adopted children feel less sure of their racial identity and have a more open view of people of different cultural heritages than children raised in more traditional families (or, alternately, they could have a better sense of racial identity and a less open view of other cultures). Children from single-parent homes might have a better sense of self-reliance but a more confused understanding of the relationship between parents (or just the opposite). Understanding more clearly the differences in developmental outcomes of children adopted into nontraditional families can shed some light on the influences that different styles and types of families can have on the development of children. Further, differences in outcomes related to characteristics of the child, family, or adoption could provide additional information about development. For example, research examining differences in a sense of racial identity among those adopted at different ages might provide some useful information to those working to understand the development of racial identity.

Studying Attachment by Studying Parent–Child Relationships in Adoptive Families

Attachment is a topic of major concern for adoptive families and the professionals who counsel them (Hughes, 1999). Important issues include whether children who have experienced severe deprivation or multiple foster placements can form secure attachments with their adoptive parents, whether attachment bonds with birth parents differ from those with adoptive parents, whether there is a critical period for attachment, and what influences make it more or less likely that a child will attach to his or her adoptive parents. Despite the obvious practical value of empirical data on these questions for adoptive families and adoption agencies, surprisingly little research has been directed toward answering them.

Further, the experiment of nature that occurs during the adoption process has the potential to provide information that can be used to evaluate attachment theory. As noted above, children are adopted from a variety of circumstances and at different ages and are generally placed in homes assessed by one or more agencies to be likely to provide the type of environment in which attachment would normally occur (i.e., at least one consistent, attentive caregiver). Thus, observing the postadoption adjustment of adopted children can inform attachment theory. For example, attachment theory would predict that children adopted before an attachment to an initial caregiver was made (e.g., those adopted at birth) would be more likely to form an attachment to their adoptive parents than would children adopted after an initial attachment would normally have been established (e.g., those adopted at 1 year of age).

A brief review of attachment theory

Normative attachment is a useful backdrop against which to evaluate and interpret problematic attachment. According to theory (Bowlby, 1969, 1973, 1980, 1988), the propensity for attachment is inborn and attachment behavior is regulated by an innate system. However, attachment bonds are not present at birth but take time to form. For the first couple of months of their lives, babies seem content to accept care from anyone, but soon after begin to prefer familiar caregivers. Around 6–7 months of age, a qualitative change occurs. At the time that infants are becoming capable of crawling off on their own, into potentially

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dangerous situations, they suddenly begin to resist and be upset by separations from one or two primary caregivers. Separation distress is the standard marker of attachment: it indicates not only that an attachment bond has formed but also with whom. Bowlby (1969) viewed the coordination between attachment and crawling as a survival enhancing adaptation. Indeed, all available empirical evidence indicates that the time course of attachment is universal (Colin, 1996; Kagan, 1982). Despite the cultural setting or family structure into which they are born, all normal human infants given the opportunity to form an emotional attachment to an adult caregiver do so well before their first birthday.

Bowlby (1944, 1958) noted that early maternal separations led to behavioral disturbances in children both during and after separations from primary caregivers. Although the form and duration of the disturbance varied as a function of separation length and child characteristics, the sequence of reactions was essentially the same: acute distress characterized by crying, extreme agitation, and active searching, followed by a period of inactivity, depressed affect, reduced appetite, and sleep disturbances, and if the separation were sufficiently extended, emotional withdrawal from those who provided care after the separation (Bowlby, 1973). Subsequent work by Ainsworth, Blehar, Waters, and Wall (1978) using the Strange Situation identified three patterns of attachment: secure, insecure/ambivalent, and insecure/avoidant. Ainsworth et al. (1978) found that the best predictor of an infant's attachment pattern was how caregivers responded to distress. Caregivers of secure infants responded promptly, consistently, and sensitively. In contrast, caregivers of ambivalent infants were inconsistent and unpredictable, sometimes responding warmly, sometimes angrily, sometimes not at all. Caregivers of avoidant infants were consistent but negative, typically rejecting their infants' bids for contact comfort.

An important prediction of attachment theory is that past relationship experiences shape future relationship behaviors. Through repeated interactions with caregivers, infants learn what to expect from them, and adjust their attachment behavior accordingly. These expectations form the basis of what Bowlby (1969) called the *internal working model* of attachment relationships. A child's internal working model will influence the child's expectations from those in subsequent relationships and will influence the developing child's (and later adolescent's and adult's) behaviors in relationships. Anxious/resistant infants have learned that if they fuss hard enough and long enough, eventually they may get the response they are seeking. In contrast, avoidant infants have learned that their needs for contact comfort are not likely to be met, so their typical response is to withdraw. Neither pattern is optimal, but each represents a sensible and relatively adaptive solution to the type of inadequate care they received. Problems arise when these less than ideal coping strategies are carried into new situations and new relationships where they often have self-fulfilling effects (Sroufe, 1983).

Early maltreatment has been shown to have an influence on attachment. Secure attachment is rare in children who have experienced severe or chronic maltreatment, with estimates ranging from 0 to 25% (compared with an average 60% in nonmaltreated samples, e.g., Crittenden, 1985, 1988; Schneider–Rosen & Cicchetti, 1984). In addition, a link exists between early maltreatment and a disorganized pattern of attachment. Children with this pattern of attachment do not display an organized coping strategy, rather, their behavior typically contains elements of the two insecure types and may also include behaviors such as head banging, exaggerated rocking, "frozen" or unusual postures, blank stares, and aborted approaches toward the caregiver.

Reactive attachment disorder is a severe form of attachment problem. Two distinct subtypes of Reactive attachment disorder have been identified: inhibited and disinhibited. The inhibited type is characterized by a "predominant disturbance in social relatedness" evident in a "persistent failure to initiate or respond to most social interactions in a developmentally appropriate way" (APA, 1994, p. 116), and it is similar to avoidant attachment in the sense that both are characterized by a reluctance to initiate or respond to close social contact. In contrast, the disinhibited type man-

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ifests in a "predominant disturbance in social relatedness" typified by "indiscriminate sociability or a lack of selectivity in the choice of attachment figures" (APA, 1994, p. 116) that is similar to ambivalent attachment in terms of its characteristically desperate attempts to satisfy unmet needs for comfort and affection. The concept of reactive attachment disorder, and its two subtypes, have been criticized, however, as not being based firmly on empirical evidence (e.g., Zeanah, 1996).

This short review suggests several theoretical issues that can be explored through data from adoption research. For example, whether age of adoption influences a child's ability to form an attachment with a new parent, whether problematic patterns of attachment shown by maltreated children are maintained after moving to a new caregiving environment, and whether distinct patterns of behavior among children with severe attachment problems can be identified. As we will see in the next section, two programs of research are beginning to address these and other questions.

Attachment to adoptive parents

When children are adopted, it is hoped that they will, in good time and with sufficient love, develop a secure emotional attachment to their new family. It is a source of great frustration and sadness to families when this does not occur. The facts of normative attachment raise many obvious and important questions related to adoption.

One factor of obvious potential importance is the child's age at the time of adoption. Recall that under normal circumstances infants first show signs of clear-cut attachment at around 6–7 months of age. Does it matter, then, whether a child is adopted before or after this age? In his initial research on attachment, Bowlby (1944) noted that the long-term negative effects of early maternal deprivation appeared to be less pronounced or entirely absent if it occurred before 7 months of age. However, two ongoing programs of research suggest that the picture is not quite so clear. Both programs are following the development of Romanian orphans who were adopted into homes in the United Kingdom or Canada. Both have provided valuable information about the development of attachment in children who experience months or years of the type of maltreatment and deprivation shown to inhibit or preclude the formation of healthy attachments. However, both have raised important questions about the measurement of attachment and about the types of influences that produce secure and insecure attachments in deprived infants.

O'Connor, Rutter, and their colleagues on the English and Romanian Adoptees Study Team have been following 165 Romanian children adopted into the United Kingdom, after most had lived for several months in the very deprived conditions of Romanian orphanages, and 52 children adopted from within the United Kingdom, who had experienced no apparent deprivation. The Romanian adoptees were divided into three groups: those adopted before the age of 6 months, those adopted between 7 and 24 months, and those adopted between 25 and 42 months. Among other issues, this team has focused on the presence of attachment disorder behaviors at 4 (O'Connor, Bredenkamp, & Rutter, 1999) and 6 years (O'Connor & Rutter, 2000) and attachment security at 4 years (O'Connor, Marvin, Rutter, Olrick, Britner, & the English and Romanian Adoptees Study Team, 2003).

To measure disordered attachment behaviors, the authors used the literature to devise three questions focused on disinhibited behaviors (a definite lack of differentiation between parents and other adults, a clear indication that the child would go off with a stranger, and a definite lack of checking back with parents when in new situations) and one question focused on inhibited behaviors (child indicates distress but does not seek comfort from parent). Parents' ratings on these questions when their children were both age 4 and 6 showed that the three disinhibition questions were correlated more highly with each other than any of them were with the inhibited question, providing initial evidence that the disinhibited and inhibited styles are distinct. The authors chose to focus on the disinhibited scale for their other analyses, because of concern that the inhibited scale had only one item.

As attachment theory would suggest, at

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age 4 years, there was a linear relationship between amount of deprivation before adoption and levels of *moderate* attachment disturbance among the U.K. adoptees and 111 of the Romanian adoptees. (Those adopted between 25 and 42 months were not assessed at 4 years.) Two percent of the U.K. adoptees, 10% of the Romanians adopted before 6 months, and 21% of the Romanians adopted between 7 and 24 months showed moderate disturbance. However, several results were not expected. First, the level of *mild* disturbance did not differ between the groups: about 40% of the children in each group showed mild disturbance. Second, 38% of the Romanians adopted between 7 and 24 months showed no measurable disturbance. Third, 44% of the U.K. adoptees showed mild levels of disturbance, even though they had apparently not experienced any deprivation and had been adopted before 6 months of age. Similar patterns were found during the assessment at 6 years, suggesting that the levels of disturbance were stable over this 2-year period.

The study of attachment security used a reunion–separation task (children who were interviewed in their homes experienced separations and reunions with their mothers) that was scored using a procedure developed by Marvin and Rutter (1994) for preschool children. Approximately 55% of the U.K. adoptees, 40% of the Romanian children adopted before 6 months, and 33% of the Romanian children adopted between 7 and 24 months showed secure attachment. Thus secure attachments among the U.K. adoptees was similar to that found among normative samples. A substantial portion of the Romanian children showed a pattern of insecure behaviors during reunions that was not classifiable using usual classification systems for preschool children (33% of those adopted before 6 months and 51% of those adopted between 7 and 24 months compared to 16% of the U.K. children). Thus, a substantial percentage of the Romanian children exhibited behaviors that were uncharacteristic of usual patterns of insecure attachment.

The second program of research has been following 46 children who had spent at least 8 months in a Romanian orphanage before being adopted by a Canadian family, 30 Romanian children who had been in an orphanage for fewer than 4 months before adoption, and 46 nonadopted, never institutionalized Canadian children. Attachment security and indiscriminate friendliness (a construct similar to disinhibited attachment disturbance) was assessed at about age 2 years (Chisholm, Carter, Ames, & Morison, 1995) and age 4.5 years (Chisholm, 1998). At a median age of 25 months, the parents of the later adopted Romanian children rated them significantly lower on the security of attachment items on the Waters and Deane Attachment *Q*-sort than did the parents of the earlier adopted or nonadopted children, and the scores of those in the latter two groups did not differ. In addition, children in the later adopted group displayed significantly greater indiscriminate friendliness than the earlier adopted children. However, as Chisholm (1998) noted, the adopted children had been in their adoptive homes for an average of only 11 months by that time, and perhaps had been in their homes an insufficient period to develop a secure attachment to their adoptive parents.

At an average age of 4.5 years, the differences seen on the earlier parent ratings on the Waters and Deane Attachment *Q*-sort had disappeared: the ratings for the later adopted children were no different from the earlier adopted or the nonadopted Canadian children. However, differences did emerge on a separation–reunion task that was scored with a procedure developed by Crittenden (1992) for preschool children. Among the Canadian children, 58% had a secure attachment, compared with 37% of the later adopted and 65% of the earlier adopted children. In addition, 52% of the later adopted children showed atypical patterns of insecure attachment, compared with 17% of the Canadian children and 11% of the earlier adopted children. The later adopted children also displayed more indiscriminate friendliness, as reported by parents, than did the children in the other groups.

Improving attachment between adopted children and their parents

Some research has suggested that the negative working model a child brings into an adoptive

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home can be modified through corrective experience, especially if the child has not suffered other forms of privation (Stovall & Dozier, 2000). When there has been privation in multiple domains, however, the outcomes are likely to be more serious and less tractable, but there is still grounds for optimism. Attachment theory specifies certain fundamental mechanisms of social interaction that promote an exclusive emotional bond between individuals. The current empirical literature supports the view that these processes operate at all ages from infancy to adulthood (Hazan & Diamond, 2000; Hazan & Zeifman, 1994). The good news for adoptive parents and for individuals with the responsibility of placing children in adoptive homes is that current knowledge and theory in the area of attachment may provide some guidelines for improving the likelihood that adopted children will be able to attach to their parents.

Evidence from studies of nonadoptive families suggests that obstacles to secure attachment can be overcome by focused and timely intervention. In a study in The Netherlands, infants who had been identified as at risk for insecure attachment were randomly assigned to two groups (van den Boom, 1994). Mothers of the infants in one group participated in three brief training sessions that provided specific instruction in sensitive caregiving; mothers of infants in the other group received no specific training. When infants were tested in the Strange Situation at 12 months of age, those in the first group were nearly three times as likely as the others to have developed a secure attachment to their mothers. Follow-up studies found that the effects of the intervention were still evident more than 2 years later not only in caregiver–child relationships, but in child–peer interactions as well (van den Boom, 1995).

An intervention reported by Toth, Maughan, Manly, Spagnola, and Cicchetti (2002) placed maltreating mothers and their infants in one of two therapeutic interventions. In one intervention, the therapist focused on providing a positive, caregiving relationship with the mother, and helping her to understand how her actions toward her child are influenced by her history and by the child's behaviors. The therapist, mother, and child strived to build more positive relationships. The results of the intervention showed that the children had much more positive and caring mental representations of their mothers and also had more positive representations of themselves. Thus, the study showed that an appropriate intervention can push preschool children's emerging representations of self and of mother in a positive direction, suggesting that the internal working models that children have about relationships may be malleable during the preschool years.

Future studies of attachment with adoptive families

The research described in this section provides important insights into the process of attachment formation in children moved from deprived environments to new families. It also raises methodological questions and points in the direction of needed future work. O'Connor et al. (1999) noted the higher than expected percentage of nondeprived adopted children who showed mild attachment disturbance and the higher than expected percentage of severely deprived children that showed no attachment disturbance. They suggested that their measure of mild disturbance might not have been appropriate, and future research will need to address this. It may also be possible that, as children's representations of self and other develop during the preschool years (Toth et al., 2002) there may be periods in which behaviors that appear indiscriminately friendly may be more normative than problematic. It is also interesting to note that the Romanian orphans who received the highest ratings on indiscriminate friendliness were more likely to have been described as favorites in their institution (Chisholm, 1998). Perhaps, for children raised in deprived settings by many people who like them, an interpersonal style characterized in part by indiscriminate friendliness may not mean the same thing as the same style in a child raised in a family with only one or two primary caregivers. Ongoing work to monitor the interpersonal styles and overall development of these children may reveal that the model of healthy attach-

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ment for them is different from the model used for most children.

The positive changes in attachment behaviors found by Chisholm (1998) and the number of deprived children reported by O'Connor et al. (1999) and O'Connor and Rutter (2000) who showed no attachment disturbance underscore the importance of discovering what in the children's experience before or after adoption, or what characteristics of the children, facilitates these positive outcomes. For example, the children's temperaments, the match between the child's and adoptive parents temperaments, parenting styles of the adoptive parents, sibling or peer interactions, nuclear or extended family size, the provision of therapeutic help for the parents and/or child, or a variety of other child, family, or neighborhood characteristics might be associated with better attachment outcomes. The ongoing accumulation of this type of information would not only be valuable for adoptive families and adopted children, but could enhance our understanding of the components of parent–child relationships that drive the development of healthy attachments.

Studying the Consequences of Early Deprivation on Physical and Cognitive Development and on Behavior Problems

For the past several decades, families in many industrialized countries have adopted children from around the world. These children often come from countries that are in crisis. After the Korean War, many American families adopted Korean children. Crises in several previous Soviet bloc countries resulted in many adoptions from those countries in the 1980s. The presence of many unwanted girls in China have encouraged adoptions through the 1990s and until today (Serbin, 1997). As noted above, the number of international adoptions has increased in the United States over the past few decades. The percentage of adoptions that are international is much higher in several other countries. For example, in 1995 it was estimated that 2/3 of the adoptions in Montreal were international and almost all of the adoptions in The Netherlands were international (Serbin, 1997).

International adoptions present many challenges for potential adoptive families. Many children adopted from countries in crisis may be malnourished and may have lived the first few months or years of their life in a problematic institutional setting (Sloutsky, 1997). For example, Johnson et al. (1992) examined the health of Romanian adoptees coming into the United States. Only 15% of the children were healthy, and all these children had spent only about a month in a Romanian institution before adoption. The rest displayed significant medical, developmental, or behavioral disorders. For example, hepatitis B was found in 53% of the children and 33% had internal parasites.

Monitoring the developmental course of internationally adopted children who spend some or much of their infancy in problematic institutional settings and then are adopted into healthy environments provides an opportunity to assess the short-term and enduring consequences of early deprivation in a way that would not be possible with other groups of children. Further, analysis of the areas in which deprivation has short-lived or no negative consequences and those in which enduring consequences appear provides important information that can be used for theorizing about the developmental mechanisms through which early deprivation influences development.

Physical and cognitive development

Several studies have explored the physical and cognitive development of adopted children who have experienced varying levels of deprivation before their adoption. This research points to the long-term negative consequences of severe deprivation, the apparent modest or few consequences of more moderate deprivation, and the extent to which early deficits in physical and cognitive development can be overcome by placement in a healthy environment.

Levy–Shiff, Zoran, and Shulman (1997) examined the adjustment of 50 children adopted from South America and 50 domestic adoptees in Israel. All of the children were adopted as newborns or infants less than 3

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months of age. When assessed between 7 and 13 years, both groups showed similar IQ scores, school grades, and school adjustment. None of these children had faced significant preadoption deprivation, suggesting that adoption into a new country and culture may have little or no influence on these issues.

The English and Romanian Adoption Study Team (described in the previous section) also monitored the children's cognitive and physical development. Rutter (1998) reported that, at the time of their adoption, most of the Romanian children were in poor health. For example, half the children were below the 3rd percentile in weight and 34% were below the 3rd percentile on height. When assessed later, at 4 years, the physical development of most of them had "caught up" considerably. Only 2% remained below the 3rd percentile in weight and only 1% in height. The Romanian children remained lighter and shorter than the English children, but only slightly so. Cognitive ability, as measured by the McCarthy Scales, was similar for the Romanian children adopted before 6 months and the English children. However, the Romanian children adopted after 6 months received lower scores than the English children (92 and 109).

O'Connor, Rutter, Beckett, Keaveney, and Kreppner (2000) reported on the children at the 6-year assessment. From the perspective of the health of the children, the findings were mixed. The good news was that the degree of "catch-up" made by the children at the 4-year assessment was maintained at the 6-year assessment and that their weight, developmental score, and general cognitive index were in the normal ranges. The bad news was that the children who had experienced extended deprivation did not "catch up" further over the 2 years between the assessments. Their physical and cognitive development appears to have been limited by their deprivation, and their healthy adoptive environment could not overcome the influence of the early deprivation.

Similar findings were reported in an earlier study by Lien, Meyer, and Winick (1977), who studied the effects of early malnourishment on 240 Korean infants adopted between the ages of 2 and 5 years. They divided the children into three groups, based on their height at adoption: Group 1 consisted of children who were severely malnourished and below the 3rd percentile of height, Group 2 consisted of moderately malnourished children from the 3rd to the 24th percentile of height, and Group 3 consisted of children from the 25th percentile and above. At the time of the study, each group of children surpassed the 50th percentile of the Korean reference standards for height and weight, indicating that many had "caught up" their growth after their adoption. Intelligence scores showed a significant difference between Group 1 (IQ mean-95) and Group 3 (IQ mean-105; although it should be noted that both were in the "average" range), with Group 2 in the middle and not significantly different from either. In the area of achievement, Group 1 did not achieve the mean for American children of that age and Groups 2 and 3 scored above the mean.

Behavior problems

A series of studies show that adopted children with no or short-term preadoption deprivation show no negative behavioral consequences several years after their adoption, and that those who experience long-term deprivation show increased behavior problems. For example, Levy–Shiff et al. (1997) found no significant differences on measures of anxiety, depression, hyperactivity, or self-concept between children adopted internationally before 3 months of age and domestically adopted children adopted as infants. Similarly, Rutter, Kreppner, and O'Connor (2001) found that Romanian children adopted before 6 months showed no more behavior problems than the U.K. adoptees.

Several researchers have reported increased behavioral problems in children with longer deprivation histories. Groze and Ileana (1996) found that children who had lived in a Romanian institutional setting, rather than being adopted directly from a birth family, were more likely to have bed wetting, self-stimulating behavior, high activity level, delayed language, and problems with fine and gross motor skills. In addition, children who had been institutionalized for longer periods had more

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of these problems than did children institutionalized for shorter periods. Similarly, Beckett et al. (2002) found that a high percentage of children adopted from Romania to the United Kingdom presented problems with rocking, self-injurious behavior, unusual sensory interests, and eating problems upon adoption, with more of those who had been in institutional care for longer periods showing each behavior. At age 4 and again at age 6, the percentage of children exhibiting these behaviors had decreased, but those with longer institution placement histories continued to show more of these behaviors.

Verhulst, Althaus, and Versluis–Den Bieman (1990) explored the functioning of 2,148 internationally adopted 11- to 14-year-old children in The Netherlands. Most of the children had been subjected to adverse conditions in their native countries, and 43% were in poor physical condition at the time of placement. A strong relationship existed between children's scores in the problem range of the CBCL and the severity of early adverse influences. Having experienced abuse was the strongest predictor of behavioral problems. Groza and Ryan (2002) also found a significant influence of abuse history on the functioning of adopted children from Romania: the abused children scored much higher on many scales of problematic behavior on the CBCL than the nonabused children.

Summary and directions for future studies of early deprivation with adoptive families

Trends shown by groups of children adopted after significant deprivation have been demonstrated by a variety of studies: children adopted at a younger age, or who have fewer negative experiences before their adoption, appear to catch up in their physical growth and tend to have intelligence, achievement, and behavior scores that are similar to children without significant deprivation in their histories, and children exposed to harsh environments for longer periods do not appear to catch up to agemates, but the intensity of the early consequences of their deprivation can be mollified.

The research to date, however, has not explored for the factors influencing the large differences seen in deprived children's early development or in their ability to catch up with age-mates after early deprivation (O'Connor et al., 2003). Research exploring connections between development after early deprivation and child, prenatal, postnatal/institutional, adoptive family, and adoptive neighborhoods and other environments could provide important information about the resiliency of children and about the issues that increase the likelihood that a child can be resilient to extraordinarily difficult environments.

Summary and Conclusion

As shown in this article, adoptive families providing a unique and useful environment through which to study many aspects of child development. Observing children's development as they are moved from one family environment to another provides many opportunities to observe the influences that each of those environments has on the developing child, as well as the influence of the move itself. In addition, observing the developing characteristics and behaviors of a child who is raised in a family in which the child shares no genes with other family members provides an opportunity to distinguish the influences of genetic heritage from family and social environment.

Behavior genetics research with adopted children and their families points to clear influences of genes on a variety of child characteristics and behaviors. Interestingly, this research has also shown the much greater influence of nonshared environmental influences than on shared environmental influences. Ongoing work in this area may continue to improve our understanding of the complex array of influences on child development.

Studies of the development of adopted children have highlighted the ongoing influence of deprived environments on many aspects of children's cognitive, emotional, and social environment, clearly indicating the importance of policies that promote positive family environments for newborns and infants. Optimistically, this research suggests that the magnitude the influence of deprived

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environments can be mollified by changes to positive environments. This research suggests that policies that promote the change from deprived to positive home environments within birth, foster, or adoptive homes can help to reverse partially the negative consequences that children from early deprived environments may experience.

Changes in policy over the past few decades that have broadened the types of families allowed to adopt children have presented an opportunity to study the influences of being raised in multiracial/multiethnic families and single-parent families. Although ethical issues surrounding the placement of children from one race or ethnicity with parents of another race or ethnicity, or whether placing children with single parents is appropriate, continue to be debated, research with these adopted families have failed to show any meaningful problems for children adopted into them. This research suggests that supportive families of a variety of types can provide healthy environments for children.

Finally, it is worth noting that, while some research with adopted children and families has taken place, a surprisingly small number of questions about child development have been investigated with adoptive families. Few psychologists and other behavioral scientists focus their efforts on adoptive families, despite the many opportunities that these families provide for research useful for understanding basic issues in child development. Studies with adoptive families are often difficult to undertake because it is often impossible to control many potential influences on development in these families. Children of many ages and with wide differences in backgrounds are placed with families with varied characteristics. This can make it difficult to control the variety of variables that behavioral scientists often believe must be controlled for valid research to be accomplished. One strategy to overcome this problem would be the creation of a database listing many adoptive families and their characteristics and the characteristics of the children they have adopted. This would allow researchers to focus on certain types of families or adopted children and compile a large enough sample to investigate issue of interest. Large samples might also allow for the statistical control of many variables. It is hoped that strategies to promote research with adoptive families will be developed so that the breadth and quality of adoption research can continue to grow.

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https://doi.org/10.1017/S0954579403000427 Published online by Cambridge University Press