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The impact of institutionalization on child development

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Abstract
During the past 10 years researchers studying children adopted from Romanian orphanages have had the opportunity to revisit developmental questions regarding the impact of early deprivation on child development. In the present paper the effects of deprivation are examined by reviewing both the early and more recent literature on studies of children who spent the first few years of life in institutions. Special attention is given to the Canadian study of Romanian adoptees in which the author has been involved. Findings across time and studies are consistent in showing the negative impact of institutionalization on all aspects of children's development (intellectual, physical, behavioral, and social–emotional). Results of studies show, however, that institutionalization, although a risk factor for less optimal development, does not doom a child to psychopathology. However, the impact of institutionalization is greater when coupled with risk factors in the postinstitutional environment. Methodological and conceptual difficulties in research with institutionalized samples of children are discussed and future directions for research are considered.

The attempt to understand human development is greatly constrained by ethical considerations that make it impossible to examine the impact of deprivation on child development. "Experiments in nature" afforded by samples of institutionalized children permit an examination of the developmental process when conditions are so severe as to impede normal development. Findings from studies of institutionalized children provide invaluable information that can inform theory, research, and social policy with respect to both normal and atypical development. Orphanage samples permit us to evaluate developmental progress after deprivation and examine how this might differ from normal development. Longitudinal studies of previously institutionalized samples can address questions concerning whether deprivation results in some skills never fully developing or whether skills are simply delayed. There is also the opportunity to examine whether the behavior of orphanage children is quantitatively or qualitatively different from the behavior of noninstitutionalized samples of children.

Institutionalized samples also provide a rare chance to examine how the roots of particular pathologies may lie in behavior that emerges as a result of the environmental context in which children reside. The study of these behaviors has the potential to inform our thinking with respect to the roots of pathology in other clinical samples of children. Researchers can also examine the ways in which institutionalized samples are similar to and different from other samples of maltreated children. Children from orphanages usually experience maltreatment and neglect on every level (physical, behavioral, social, and emo-

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tional), but unlike many maltreated groups, they have experienced the intervention of adoption into supportive home environments that provide for developmental needs. Examination of these groups and their progress may suggest ways in which we might intervene with other maltreated samples.

There are, however, inherent limitations to what can be learned from any one study of institutionalized children. Such experiments in nature are often considered to be real-life counterparts of experimental animal studies of early deprivation. However, it might be preferable, when using the phrase, to place more emphasis on the word *nature* and less on *experiment*. Whereas variables in experiments are isolated and controlled, this is not the case in real life. For example, for experimental purposes it is possible to restrict animals' perceptual experience while keeping the rest of their environment equivalent to that of animals with unrestricted perceptual experience. For institutionalized children, on the other hand, the variable of "institutionalization" refers to a complex mix of social, perceptual, physical, intellectual, and emotional deprivation. As a result, when institution-reared children are found to differ from family-reared children, it is usually not possible to specify the type of deprivation that produced the differences. In institution studies the ages of entry into and exit from the institution are not under experimental control. Family needs, children's conditions, and society's threshold for removing children from their homes are all factors in determining entry. The age of leaving the institution varies according to national social and economic policy and the child's health, physical attractiveness, and gender. When children enter institutions at or shortly after birth, their age at adoption is confounded with duration of deprivation, so that it is never possible to tell whether age of adoption or length of institutionalization is the effective variable. In the minority of cases in which children enter institutions considerably later than birth, the conditions under which they were raised before entering the institution are also relevant to the outcome.

In any topic studied over a period of 60 years the use of different measures becomes a problem. Attachment problems in institutionalized children were first noted before the study of attachment began; indeed, it was studies of orphanage children that helped to lead Bowlby to formulate the concept of attachment (Bowlby, 1951). There is a question whether current measures of attachment are appropriate for assessing attachment in orphanage samples because they were not designed to evaluate the presence or absence of an attachment relationship. Rather, these measures assess the quality of attachment and make the assumption that an attachment relationship exists. The measurement of attachment is still not agreed upon; even recent studies of orphanage children's attachment to their adoptive parents have used different systems to measure attachment at the preschool age. Another problem is the need to develop new measures for concepts described but not measured earlier. The indiscriminate friendliness toward adults often shown by previously institutionalized children was first described 58 years ago (Goldfarb, 1945b), but it is only in the last 8 years that researchers have attempted to develop measures; again, there is no one agreed-upon measure. Although the lack of agreement on measurement systems complicates the comparison of studies, the use of different systems not only broadens the number of different behaviors examined but may also clarify the meaning of such behavior.

Institutionalization studies also have the problem of having to use measures standardized on home-reared children to assess institution-reared children. For example, many items on tests of capability at young ages are simply not applicable to orphanage populations. One does not often find a home-reared child who has never had an opportunity to grasp an object small enough to require finger involvement, but this is common in children who have been kept in cribs for the first year or more. Problems may arise with subscales on standardized tests of behavior problems: Can the same items that have been shown to fall into factors in nonclinical, or even clinical, samples be assumed to be organized into the same factors in a sample reared under such different conditions?

The question of appropriate comparison groups for children in or from institutions is a thorny one. There are many possible com-

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parison groups, but each answers a different question and fails to answer other questions. Previously institutionalized children are both adopted and formerly institutionalized. To separate the effects of institutionalization from those of adoption, for example, one might look at adoptees who did not come from institutions. Rutter and colleagues (Rutter & the English and Romanian Adoptees [ERA] Study Team, 1998) employed a comparison group of children adopted in the United Kingdom; but all of these children were adopted before 6 months of age, which makes them an adequate comparison only for children adopted from Romania before age 6 months. Because there are few children who go directly from the birth home to an adoptive home at later ages, the researcher who wanted to compare groups of children who have been adopted later would have to compare previously institutionalized children to domestic adoptees who may have been abused or neglected in their birth homes and/or then moved through (sometimes several) foster homes before adoption.

Alternatively, one could use a comparison group of children who stay in institutions. This is perfectly legitimate but it answers a different question: how much better off are adoptees from institutions than those left behind? It does not tell us anything about how previously institutionalized children's performance compares to that of the home-reared children among whom they now live.

Canadian researchers (Ames, 1997) have used two different age-matched groups to compare to their orphanage group. One is an early-adopted group of children who would have gone to Romanian orphanages had they not been adopted before 4 months of age. This group has thus had the same poor prenatal and perinatal experience as institutionalized children but differs from the institutionalized group in terms of age at adoption and (at any common age) length of time spent in the adoptive home. The second comparison group in the Canadian study consists of Canadian-born children reared in homes similar to those of the orphanage children after adoption; however, in addition to being different with regard to the crucial variable of orphanage experience, the two groups also differ in the presence or absence of the adoption experience.

The point to be made is that there is no perfect comparison group in nature that can possibly answer all the important questions that can be asked. Each of the different comparison groups teaches us something, but none is a complete control group. Both the researcher and the reader of research must pay careful attention to what a particular comparison group can or cannot tell us. There is also an advantage to this situation, however. The fact that different studies have used different measures or types of comparison groups sometimes makes comparing them more difficult, but it also increases the number of questions that can be asked. In addition, when similar conclusions are drawn from studies using different measures and comparison groups, those conclusions may be accepted with considerable confidence.

This article reviews the impact of institutionalization on the following areas of child development: physical development; developmental milestones, intellectual development, and academic achievement; behavior problems; indiscriminate friendliness; and attachment. Under each area the characteristics of institutionalized and previously institutionalized children are reviewed, especially with regard to their differences from comparison groups. Evidence on the persistence of or changes in the behavior, its relation to length of institutionalization, and its correlates are also presented. The results of recent studies of adoptees from Romanian orphanages, especially the Canadian study in which this author has been involved (Ames & Chisholm, 2001; Chisholm, 1998, 2000; Chisholm, Carter, Ames, & Morison, 1995; Fisher, Ames, Chisholm, & Savoie, 1997; Gunnar, Morison, Chisholm, & Shuder, 2001; Morison, Ames, & Chisholm, 1995) are emphasized, but pioneer studies of institutionalization are also referenced and their conclusions included wherever relevant to the more modern work.

Developmental Milestones, Intellectual Development, and Academic Achievement

Research interest in the developmental consequences of extreme deprivation in infancy began intensely in the 1940s and 1950s with the work of Rene Spitz (1945a, 1945b), William

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Goldfarb (1943a, 1944, 1945a, 1947, 1955), and John Bowlby (1953). Most research focused on intellectual development. Rene Spitz (1945a, 1945b), who studied children in institutions, reported a drastic drop in infants' developmental quotients (DQs) over the early months of institutional care. He reported that by the end of the second year infants' DQs had dropped to a low of 45, as compared to an average DQ of 100. Spitz described the deterioration of children as progressive in spite of the fact that physical conditions in orphanage had improved over the course of his study. Given that improvements to orphanage infrastructure had not resulted in an improvement in DQ scores, Spitz concluded that children were irreparably damaged by institutionalization in the first years of life.

William Goldfarb (1945a, 1955) studied 15 children who had been reared in an institution for the first 3 years of their lives and were subsequently placed in foster care. He compared those children to a group of children who had been in foster care since early infancy. Goldfarb found that even in adolescence the institution group was delayed intellectually relative to the foster care group, and he claimed that early institutional rearing resulted in developmental deficits that were not overcome once children were placed in more stimulating and loving environments.

Researchers conducting this early work claimed quite strongly that children were intellectually compromised as a result of early institutionalization. This claim, however, was criticized largely on the basis of the methodological limitations of the research (Longstreth, 1981; Pinneau, 1955). Critics reported that much of the early literature provided few details regarding either the conditions in orphanages or the assessments used to evaluate children. Very often the number of children who were tested, the ages at which they were tested, and how often assessments were carried out were unspecified. Such limitations have made it difficult for current researchers to have confidence in the early data on institutionalized children.

Not all early studies, however, predicted such dire outcomes for institutionalized children. In many parts of the world researchers were conducting studies in institutions attempting to ascertain the kinds of interventions that might prevent poor developmental outcomes. Such interventions included providing sensory stimulation (Broussard & Decarie, 1971), placing infants as "houseguests" with older residents (Skodak & Skeels, 1945, 1949), and improving child to caregiver ratios (Hunt, Mohandessi, Ghodessi, & Akiyama, 1976). All of these studies showed that simple changes within the orphanage environment increased children's developmental competence.

Further support for the idea that institutionalized children were not destined for developmental compromise came from the work of Barbara Tizard and her colleagues with children who had spent the first 2 years of their lives in high-quality institutions in the United Kingdom (Tizard, 1977). In these institutions the child to caregiver ratios were 3:1 and the children experienced adequate social stimulation, were taken on outings, and were fed well. The major way in which orphanage children's lives differed from the lives of home-reared children was that caregivers were discouraged from forming intimate relationships with them (Tizard & Tizard, 1971). Tizard and Joseph (1970) first assessed children in the institution when they were 2 years old and compared them to a sample of home-reared children from a working class background. They found that the institution children's IQ scores were only slightly lower than those of the working class children and that their language was only slightly delayed. At age 4.5 the mean IQ of the children in an institution was in the average range and no language problems were found (Tizard & Rees, 1974). Hodges and Tizard (1989) reported that children adopted from the institution had normal IQs at 8 and 16 years of age. Tizard's findings were more positive than the findings of the earlier research, but it is important to note that the children in Tizard's sample had not experienced the *extreme* deprivation experienced by earlier samples of children (e.g., Goldfarb, 1945a). Therefore, Tizard's more positive findings may be partially explained by less severe deprivation.

Although this research challenged Spitz's claim that the damage resulting from institu-

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tionalization was irreparable, it did not address the issue of the extent to which length of institutionalization made a difference in developmental outcomes. Dennis (1973) followed children from a Lebanese orphanage after they were adopted and compared the developmental outcomes of children adopted at different ages. He claimed that children who had been adopted before 2 years of age eventually regained normal IQs whereas those who were adopted after 2 years of age showed permanent deficits in IQ. Although this claim has often been cited, it has not been adequately tested.

Given that much of the data from this earlier research was descriptive, anecdotal, and short term, making it difficult to evaluate, more recently researchers have tried to examine larger samples of children using standardized measures of DQ, IQ, and academic achievement. Although their findings are more hopeful, they are not inconsistent with the early literature. Both sets of literature clearly demonstrate that institutionalization early in life has a negative impact on intellectual development and that it is not only institutionalization but also the *length* of institutionalization that is important.

Most of the recent information we have concerning the impact of institutionalization on intellectual development has been the result of the 1989 overthrow of the Ceausescu regime in Romania, after which the world became aware of thousands of children being housed in Romanian state-run orphanages. Descriptions of these orphanages have been reported elsewhere (Fisher, Ames, Chisholm, & Savoie, 1997; Groza & Ileana, 1996), and it is clear that they were as bad as or worse than the conditions reported in the earlier literature.

Shortly after the revolution, Kaler and Freeman (1994) were able to assess children within the orphanage context. They conducted cognitive assessments on 25 children ranging in age from 23 to 50 months who resided in a Romanian orphanage and compared them to same age peers from a Romanian kindergarten class. Apgar scores that were available for 13 of the children indicated that they had normal births. Using the Bayley Scales of Infant Development (Bayley, 1969), Kaler and Freeman (1994) found that none of the orphanage children were functioning at their age level, and 20 of the 25 children functioned at levels that were less than half their chronological age. Children's Bayley scores were unrelated to their Apgar scores at birth, suggesting that these data could not be explained by any initial biological insult. Similarly, Carlson and Earls (1997) reported that a group of 2- to 9-month-old infants in a Romanian orphanage scored well below the Bayley norms for their age. Further support for these findings was provided by Sloutsky (1997), who assessed differences in IQ scores between 6- to 7-year-old children reared in a Russian orphanage and children of the same age reared at home and found that the orphanage children scored lower in IQ than home-reared children.

Other researchers have been able to evaluate the intellectual development of previously institutionalized Romanian children after the profound intervention of adoption. These two projects, which are ongoing and have now followed children up to 8 or more years after adoption, have provided the clearest information we have regarding intellectual development in postinstitutionalized children. The first project, in British Columbia, Canada, comprised an initial sample of 46 Romanian children who had spent at least 8 months (range = 8–53 months) in a Romanian orphanage (orphanage group) prior to their adoption to Canada, when they were a median 18.5 months old (range = 8–68 months); 29 children who would have gone to orphanage in Romania had they not been adopted prior to 4 months of age (early-adopted group); and 46 Canadian-born, nonadopted, never institutionalized children (Canadian-born group) who were individually matched on demographic characteristics to children in the orphanage group (Ames, 1997). The second project (Rutter & the ERA Study Team, 1998) comprised a sample of 165 children adopted to the United Kingdom from Romania between birth and 42 months of age. Most of the children, but not all, had been adopted from orphanages. These children were compared to 52 children who were adopted within the United Kingdom before 6 months of age.

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Morison and colleagues (Morison, Ames, & Chisholm, 1995; Morison & Ellwood, 2000) examined development in the Canadian sample of Romanian orphanage children, once based on retrospective reports from when their parents first met them, once when the children had been in their adoptive homes for 11 months, and once when they had been in their adoptive homes for approximately 3 years. Based on parents' reports of their children's developmental condition when they first met them, Morison et al. (1995) found that 78% of orphanage children were delayed in all four areas of development (personal–social, gross motor, fine motor–adaptive, and language development) assessed by the Revised Denver Prescreening Developmental Questionnaire (R-DPDQ; Frankenberg, 1986). There was not a particular area of development in which orphanage children were specifically compromised; rather, delay was pervasive across all areas. Rutter and his colleagues reported similar findings with their sample of adoptees in the United Kingdom (Rutter & the ERA Study Team, 1998).

By 11 months postadoption, improvement was evident in the Canadian sample (Morison et al., 1995). At that time the majority of orphanage children remained delayed in two or more areas of development according to their parents' report on the R-DPDQ. In addition, Revised Gesell Developmental Schedules (Knobloch, Stevens, & Malone, 1980) administered to 23 of the orphanage children showed that, although children were progressing at more than 1 month developmentally for each chronological month in Canada, their developmental quotients in areas of gross motor, adaptive, personal–social, and language averaged in the borderline range (68–85) and their fine motor abilities averaged in the low end of the average range (85+). Morison and colleagues (Morison et al., 1995) examined whether there were particular correlates associated with children's intellectual test scores at 11 months postadoption. Although no demographic characteristics of the family (i.e., parents' age and education, family income, and socioeconomic status) were associated with development at this time, there were characteristics of children's institutional experience that were related to test scores. The length of time that children spent in the orphanage was positively associated with the number of areas of delay on the R-DPDQ and negatively correlated with children's scores on the adaptive, personal–social, and language scales of the Gesell. In addition to the length of time in an institution, the availability of toys and having been a favorite in the institution were associated with fewer delays and higher scores on the Gesell scales, whereas being described as dirty when first met by parents was associated with more delays and lower Gesell scores (Morison et al., 1995).

Three years postadoption these researchers (Morison & Ellwood, 2000) evaluated children's intellectual development using the Stanford–Binet Intelligence Scale, Fourth Edition (SB4: Thorndike, Hagen, & Sattler, 1986). Given Dennis' (1973) earlier claim, IQ results were analyzed separately for orphanage children who had been adopted before and after they were 2 years old. In comparing IQ scores among the younger children, who were 4.5 years old when assessed, Morison and Ellwood (2000) found a clear ordering among the groups, in which the Canadian-born group scored highest (M = 109), the early-adopted children scored in the middle (M = 99), and the orphanage children scored lower (M = 91). The orphanage children adopted at later ages (24–60 months old) had the lowest IQs of all (M = 68).

Le Mare, Vaughan, Warford, and Fernyhough (2001) conducted a later follow-up of the Canadian sample, when the children were 9.5 years old or older. The pattern of group results remained consistent with the earlier findings. Canadian-born children, whose families were matched to the other groups on demographic variables, scored highest (M = 108), early-adopted children scored lower (M = 99), orphanage children adopted between 8 and 24 months of age scored even lower (M = 89), and orphanage children who had been adopted after 2 years of age scored lowest of all (M = 71). Not unlike their earlier performance on the R-DPDQ, the scores of later-adopted children were lower across all scales of the SB4 (i.e., overall IQ, verbal comprehension, and nonverbal reasoning) at both 3 years after

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adoption (Morison & Ellwood, 2000) and 8 years after adoption (Le Mare et al., 2001), demonstrating that orphanage experience had a general impact on all areas of intelligence.

Rutter and colleagues used the General Cognitive Index of the McCarthy Scales (McCarthy, 1972) and reported a similar ordering among their groups of 4-year-old (Rutter & the ERA Study Team, 1998) and 6-year-old children (O'Connor, Rutter, Beckett, Keaveney, Kreppner, & the ERA Study Team, 2000), with within-U.K. adoptees and Romanian children adopted before 6 months of age scoring better than Romanian children adopted between 6 and 24 months of age, who in turn scored better than Romanian children adopted between 24 and 42 months of age. This consistent ordering of groups across studies demonstrates the negative and cumulative effect of institutionalization on IQ. Institutionalization may not, however, be the only factor underlying this ordering. The fact that the IQs of the early-adopted children in the Canadian study were lower than those of Canadian-born children in homes matched on demographic variables also suggests possible effects of genetic background, prenatal and perinatal care, and adoption, which were shared by the early-adopted and orphanage children (Morison & Ellwood, 2000).

The importance of length of institutionalization for IQ is also supported by several reports of negative correlations between the two variables: $r = -.75$ 3 years after adoption (Morison & Ellwood, 2000), $r = -.48$ at age 6 years (O'Connor, Rutter, Beckett, et al., 2000), and $r = -.44$ at 8 or more years after adoption (Le Mare et al., 2001). Several reports (Morison & Ellwood, 2001; Rutter & the ERA Study Team, 1998; O'Connor, Rutter, Beckett, et al., 2000) found that length of institutionalization was the best predictor of children's IQ when entered in multiple regressions with other variables.

Compared to the Canadian sample (Morison & Ellwood, 2000) in which orphanage children adopted after 2 years of age scored in the low end of the "slow learner" range on IQ ($M = 68$), the Romanian children in the U.K. sample (O'Connor, Rutter, Beckett, et al., 2000) who were adopted after 2 years of age scored at the low end of the normal range of intelligence ($M = 90$). This difference may be explained by considering differences in group composition between the two studies. The orphanage children in the Canadian study had all spent at least 8 months in an orphanage and had spent the great majority of their lives in institutions. The correlation between age at adoption and total time in institution was +.97 (Morison & Ellwood, 2001). In contrast, close to 15% of the U.K. sample did not experience an institutional upbringing: some children had been reared in a family setting and others had been institutionalized for as little as 2 weeks (Rutter & the ERA Study Team, 1998). Inclusion of children with little or no orphanage experience may have contributed to higher average IQ scores in the children adopted after age 2 to the United Kingdom than in their counterparts in the Canadian sample.

Poor academic achievement has been found in both children in orphanages and children after adoption from orphanage. A study of children reared in Greek orphanages in which conditions were far superior to the conditions found in Romania found lower academic performance among 9-year-old orphanage children compared to same gender and age peers living at home (Vorria, Rutter, Pickles, Wolkind, & Hobsbaum, 1998). Le Mare et al. (2001) studied children after they had been in Canada 8 years or more and found that, according to teachers' reports of academic performance and results on a standardized achievement test, the Canada Quick Individual Educational Test (Wormelli & Carter, 1990), Canadian-born children performed best, orphanage children adopted before 2 years of age and early-adopted children (adopted before 4 months) obtained intermediate scores, and orphanage children adopted after 2 years of age performed the worst. In addition, 12% of orphanage children adopted before 2 years of age and 60% of orphanage children adopted after 2 years of age had repeated a grade. In comparison, only one early-adopted child and no Canadian-born children repeated a grade in school. Le Mare et al. (2001) concluded, however, that even though many orphanage children were struggling within the

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school context, a noticeable number of them were functioning well within the average range academically.

There is no doubt that the intervention of adoption out of orphanage is a powerful one; this is supported by the recent literature demonstrating improvements in IQ after adoption (Le Mare et al., 2001; Morison et al., 1997; Morison & Ellwood, 2000; Rutter & the ERA Study Team, 1998; O'Connor, Rutter, Beckett, et al., 2000). Undoubtedly, every child is doing better intellectually than he or she would be doing had they remained in an orphanage, but the environment they encounter postadoption also makes a difference. Morison and Ellwood (2000) found that not only institutionalization but also the home environment contributed to children's IQ scores 3 years after adoption. Children's home environments were measured using the Home Observation for Measurement of the Environment (HOME; Caldwell & Bradley, 1984). The more stimulating and supportive the home environments provided by parents, the higher the IQs of the children. Morison and Ellwood (2000) found in a multiple regression that in addition to length of institutionalization and children's R-DPDQ scores when their parents first met them, their scores on the HOME contributed significantly to intellectual outcomes.

Development of children in institutions and children adopted from institutions has been studied for over 60 years. The strongest finding from the many studies is that spending time in an orphanage is related to lower DQs, IQs, and academic achievement. The longer the length of institutionalization, the greater the decline in these measures. After removal from orphanage, children improve on developmental and intellectual measures, but those who have been institutionalized for a long period of time may still show significant delays for many years after adoption. The effect of length of institutionalization on development has been demonstrated both through correlations and through group differences, most often by comparing groups that spent less than 2 years with those who have spent more than 2 years in an orphanage. The division at 2 years arose for two reasons: first, because of Dennis' (1973) assertion (based on insufficient evidence) that children adopted before 2 years of age eventually regained normal IQs whereas those who were adopted after age 2 showed permanent deficits, and second, because the great majority of children adopted from orphanages since 1990 have been adopted before the age of 2, thus making it difficult to get an "older-adopted" group if group division lines are set higher than the 2-year mark. The findings obtained with the correlational and the group differences data are congruent, but it is unfortunate that under-2 versus over-2 comparisons have become so common. Inspection of scatterplots of correlational data reveals that the relationship of length of institutionalization to cognitive measures is generally continuous and does not show any clear dividing point at 2 years of institutionalization.

The older children are when adopted, the more difficult is the task, because they not only have greater deficiencies to make up but also have less time to recover before they have to cope with formal school classes. Because of this, many of them repeat a grade in school. There are, however, some orphanage children who in spite of their poor start are functioning well academically and appear not to have been greatly intellectually compromised by their early experience. Another common finding is that both conditions in orphanages and conditions in adoptive homes can modify the amount of cognitive deficit. Children do better if they are reared in better quality institutions (e.g., those studied by Tizard, 1977) or in institutions in which perceptual or social environments have been enriched. They also have higher IQs and academic achievement after adoption if their home environments are more stimulating and supportive.

Although comparisons of previously institutionalized children with home-reared children suggest that institutionalization per se is the operative factor affecting their performance, the reason that children end up in orphanages must not be forgotten. Whereas there are cases in which children from sound biological, economic, and social backgrounds are institutionalized, it is more commonly the case that chil-

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dren require institutional care because of a parental problem that may have genetic or behavioral implications for the child (e.g., alcoholism, drug abuse, mental retardation, mental illness) or because of social or economic conditions in the family that also mean that children receive poor prenatal or perinatal care or even abuse before entering an orphanage. The possible effect of these extrainstitutional, but associated, factors is shown when children with little or no institutional experience but from the same backgrounds as institutionalized children (e.g., the early-adopted group in Morison et al., 1995) score lower than home-reared comparison groups matched on demographic characteristics of their homes.

Physical Development

Dana Johnson and colleagues (Johnson et al., 1992) examined the medical condition of 65 previously institutionalized Romanian children who were adopted to the United States. They found that only 15% of these children were considered physically healthy at the time of adoption. Convergent evidence for this finding comes from the Romanian children adopted to Canada (Fisher et al., 1997). In this sample, 85% of children had a reported medical problem. Similarly, Hostetter, Iverson, Thomas, McKenzie, Dole, and Johnson (1991) found that at least one medical problem was reported for a majority of children adopted from 15 countries in East and South Asia, Central and South America, Africa, and the Caribbean and Pacific Islands. Fisher et al. (1997) found that according to their parents' reports orphanage children's most common medical problems when they were first adopted were intestinal parasites (31% of children), hepatitis B (28% of children), and anemia (15% of children). These medical problems are consistent with those noted by other researchers who have examined medical problems in previously institutionalized children from Romania (Benoit, Jocelyn, Moddeman, & Embree, 1996; Gyorkos & MacLean, 1992; Jenista, 1992; Marcovitch, Cesaroni, Roberts, & Swanson, 1995) and from several other countries (Hoksbergen, 1981; Hostetter et al. 1991). Hoksbergen surveyed parents from The Netherlands who had adopted children from Korea, Bangladesh, Columbia, India, and Indonesia and found that malnutrition, intestinal parasites, and skin diseases were common. Fisher et al. (1997) found that 3 years after adoption the Romanian children's medical problems had greatly improved but that children from Romanian orphanages still had more medical problems than both the early-adopted and Canadian-born comparison groups.

In addition to having particular medical problems, previously institutionalized children are typically small and malnourished after the orphanage experience. Eighty-five percent of orphanage children in the Canadian sample fell below the 10th percentile and 59% of children fell below the 5th percentile for weight (Morison et al., 1995). In another group of 16 Romanian children adopted to Canada, 50% were below the 5th percentile for weight and 44% were below the 5th percentile for height (Benoit et al., 1996). Similarly, in the U.K. sample of Romanian adoptees, Rutter and the ERA Study Team (1998) reported that half of the children had heights, weights, and head circumferences below the 3 percentile. The evidence of delays in physical growth among previously institutionalized children is fairly consistent, and such delays are still apparent up to 3 years postadoption (Carlson & Earls, 1997; Chugani et al., 2001; Johnson et al., 1992; Rutter & the ERA Study Team, 1998). In several studies growth retardation in height has been shown to be associated with the length of time that children had spent in institutions (Ames, 1997; Johnson et al., 1992; Rutter & the ERA Study Team, 1998). The longer that children spent in an orphanage, the shorter they were for their age.

Very few studies of orphanage-reared children have focused on the impact of institutionalization on physiological development. The only physiological measures that have been examined are cortisol levels (Carlson & Earls, 1997; Gunnar et al., 2001) and patterns of brain glucose metabolism (Chugani et al., 2001). Several researchers have proposed that the impact of early adversity on physical and psychological development is mediated, in part, through effects on the stress-sensitive hypothalamic–pituitary–adrenocorticol (HPA) sys-

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tem (Gunnar, 2000; Heim, Owen, Plotsky, & Nemeroff, 1997). This hypothesis is based on substantial preclinical evidence that disturbances in caregiving early in life alters development of the HPA axis and its central releasing hormone (Sanchez, Ladd, & Plotsky, 2001). Although studies in rodents suggest that early deprivation of maternal care produces hyperresponsivity of the HPA system, studies in nonhuman primates have yielded evidence of disturbances in the HPA diurnal rhythm and low, rather than elevated, basal levels of cortisol, the hormonal product of this system (Dettling, Feldon, & Pryce, 2002). Both hyper- and hypocortisolemia can have negative effects on health and behavioral functioning (McEwen, 1998), although the impact of either type of dysregulation during periods of rapid brain development is not well understood.

The first study to examine cortisol levels among orphanage children was conducted by Carlson and Earls (1997). They measured ambulatory cortisol levels in 2-year-old children residing in a Romanian orphanage and compared them to a sample of 2-year-old family-reared children. Carlson and Earls found that orphanage children's cortisol levels were not elevated as compared to family-reared children. Group differences were apparent, however, in the pattern of cortisol production over the day. Family-reared children displayed the typical pattern: cortisol levels were highest in the early morning and decreased over the day. Orphanage children, on the other hand, did not display this pattern; indeed none of the children they studied exhibited the typical diurnal pattern of cortisol production. Noon levels of cortisol were positively correlated with delays in cognitive functioning in the orphanage group. Carlson and Earls (1997) suggested that orphanage experience disturbs the diurnal pattern of cortisol production but does not result in increased levels of cortisol concentrations overall.

Gunnar and colleagues (2001) examined cortisol levels in the Canadian sample of Romanian adoptees tested 6.5 years after adoption to determine whether adoption into families would normalize the diurnal activity of this axis. Children who had spent more than 8 months in Romanian orphanages prior to their adoption were compared to children adopted from orphanage before they were 4 months of age (early-adopted group) and to Canadian-born children. The children, who ranged in age from 6 to 12 years at the time of cortisol sampling, all displayed the normal diurnal rhythm in cortisol. The orphanage children, however, had higher cortisol levels than children in the comparison groups. Evening levels were most highly correlated with the length of time children had spent in institution. Children's cortisol levels were unrelated to either IQ scores obtained several years prior to cortisol assessment or their age at cortisol measurement. This was a small sample of children (n = 16 orphanage group children), and thus the generalizability of these results to other institutionalized children must be viewed with caution.

Chugani and colleagues (2001) examined brain dysfunction in ten 7- to 11-year-old children who had spent on average 38 months (range, 16–90 months) in a Romanian orphanage prior to their adoption to the United States. At the time of assessment, children had been in their adoptive homes for an average of 67 months (range = 15–113 months). Abnormalities in brain glucose metabolism were examined using functional neuroimaging with positron emission tomography. The orphanage children were compared to 17 normal adults and to 7 children (age range = 7–13 years) with medically refractory focal epilepsy but who had normal brain glucose metabolism in the unaffected hemisphere. Chugani et al. (2001) found lower glucose metabolism in several areas of the brain among Romanian adoptees than in either the adult or child comparison groups. They suggested that the decreased brain glucose metabolism likely resulted from the Romanian adoptees' experience of early deprivation and may be one explanation for the cognitive and behavioral deficits seen in many previously institutionalized children. The reader is cautioned that early deprivation in Chugani et al's sample appears to have included an unusually high frequency of physical abuse. Chugani et al. (2001) reported that 5 of the 10 Romanian children they assessed had physical scarring that ap-

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peared to have resulted from lacerations, burns, or broken bones. This rate of physical abuse is much higher than in any other study of Romanian adoptees. It is possible therefore that the brain dysfunction found by Chugani et al. (2001) may be at least partially related to pain and fear beyond the levels typical of institutional life.

In summary, studies agree that children adopted from orphanages tend to be in poor health, malnourished, and small. The longer children remain in an orphanage, the shorter they are for their age. There is some evidence that orphanage children lack the normal diurnal pattern of cortisol production and have lower than normal brain glucose metabolism, but the full meaning of these findings is unclear. Further studies using a wider range of physiological variables will be necessary to elucidate this area of research.

Behavior Problems

Across studies researchers have consistently found that children with orphanage experience have more behavior problems than children without orphanage experience. Goldfarb (1943b) found that previously institutionalized 6- to 8-year-old children who had been placed in foster care at age 3 scored higher on behavior problem checklists than noninstitutionalized children of the same age who had spent their lives in foster care. The same difference between these groups was also found during adolescence (Goldfarb, 1943a). Even children who were adopted from the relatively benign orphanage environment studied by Tizard were described by their teachers as having more behavior problems than their classmates at both 8 (Tizard, 1977) and 16 years old (Hodges & Tizard, 1989). Verhulst, Althaus, and Versluis–Den Bieman (1990a, 1990b) found that 10- to 15-year-old children who had been adopted from other countries to the Netherlands between birth and 10 years of age had more behavior problems than same-age nonadopted children.

Recent studies of Romanian adoptees have found similar results but have gone further in specifying the problems and tracking their changes over time. Fisher et al. (1997) found that 11 months after adoption Romanian orphanage children adopted to Canada had higher internalizing and total scores on the Child Behavior Checklist (CBCL; Achenbach, Edelbrock, & Howell, 1987) than did early-adopted or Canadian-born children. No differences were found between the groups on externalizing behavior problems at that time. When children had been in Canada for 3 years, however, their externalizing and total scores were higher than those of Canadian-born children (Ames, 1997), and these scores remained higher than scores in the comparison groups more than 8 years after adoption (Warford, 2002). Marcovitch et al. (1997) reported similar results in their sample of 3- to 5-year-old Romanian children. Children adopted after 6 months of age had higher externalizing and total scores on the CBCL than Romanian children adopted before 6 months of age. In the Canadian sample (Ames, 1997) it initially appeared that in addition to becoming more externalizing, orphanage children had become less internalizing from 11 months to 3 years postadoption. However, this resulted from a difference in the items comprising the internalizing scales on the CBCL version for 2- to 3-year-olds used at the earlier time and the CBCL version for 4- to 18-year-olds used at the later time. Although 3 years after adoption the orphanage children no longer scored higher than comparison groups on the internalizing scale of the CBCL, they continued to score higher on the same internalizing items on which they had scored higher at 11 months postadoption, that is, stares into space, strange behavior, acts too young, and speech problems. After 3 years in Canada there was little change in their early internalizing behaviors.

Indications that length of institutionalization is positively related to number of behavior problems have been found by Ames (1997), Beckett, Bredenkamp, Castle, Groothues, O'Connor, Rutter, and the ERA Study Team (2002), Fisher et al. (1997), Marcovitch et al. (1997), Verhulst et al. (1990a, 1990b), and Warford (2002).

Having experienced institutionalization in the first year or two of life has been associated not only with children experiencing more behavior problems than normative samples

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but also with particular kinds of behavior problems. In the Canadian sample, researchers conducted in-depth interviews with parents regarding any behavior problems they were experiencing with their children at or soon after adoption (Fisher et al., 1997). The main areas of problematic behavior were eating, stereotyped behavior, and peer relationships. Eleven months after adoption 65% of orphanage children had eating problems: parents reported that one-third of children refused to eat solid foods and almost one-third of children overate. The refusal to eat solid foods has also been reported for toddlers adopted from Bulgarian orphanages (Ripley, 1992) and children adopted to the United Kingdom from Romanian orphanages (Beckett et al., 2002). Fisher et al. (1997) suggested that these problem behaviors were directly attributable to orphanage life. It is not surprising that Romanian orphanage children had difficulty with solid foods, given that they were fed entirely by bottle for the first 1.5–2 years of life. Such behavior is not unlike the refusal to eat solid foods found among North American infants when the foods are first introduced (Wasserman, 1987). Parents in the Canadian study reported that during the first 11 months after adoption 85% of the orphanage children's eating problems had improved or were completely resolved (Fisher et al., 1997). Beckett et al. (2002), however, reported that 15% of children adopted from Romania to the United Kingdom were still experiencing difficulties eating solid foods at 6 years of age. It appears this is a longstanding problem for some children.

The problem of overeating was also reported in the earlier literature on institutionalization (Flint, 1978; Goldfarb, 1943b; Hoksbergen, 1981; Lowrey, 1940; Provence & Lipton, 1962; Tizard, 1977). In the Canadian sample, many parents of orphanage children reported that they continued to offer food to children after a meal and that it was never refused. Given orphanage children's malnutrition and small size, such overeating probably represents their bodies' natural catch-up mechanism. Children in orphanage had never eaten enough food to allow them to learn feelings of satiety (Fisher et al., 1997). Eating problems have been found to decrease over time (Ames, 1997, Marcovitch et al., 1997). Three years after adoption, orphanage children had no more eating problems than did Canadian-born or early-adopted children (Ames, 1997).

A common behavior problem found in most samples of orphanage children is stereotyped behavior, that is, repeating the same movement over and over, as in body rocking. In the Fisher et al. (1997) sample 84% of orphanage children displayed one or more stereotyped behaviors whereas no Canadian-born and only one early-adopted child had a stereotypy. Sixty-seven percent of children rocked, and 19% moved their hands stereotypically. In the U.K. sample, 47% of the Romanian children rocked when first adopted (Beckett et al., 2002). Marcovitch et al. (1995) and Groza and Ileana (1996) also reported stereotyped behaviors in their samples of Romanian children, and this behavior was previously described by Flint (1978), Goldfarb (1945a), and Tizard (1977). Fisher et al. (1997) suggested that the stereotyped behavior of orphanage children may represent the prolongation of the stereotyped behaviors found in normal infants around the time they learn to sit, stand, or walk (Thelan, 1979, 1981). It may also reflect a self-soothing strategy or an attempt to self-stimulate in the barren orphanage rooms.

In the Canadian sample, stereotyped behavior was the most frequently reported behavior problem of orphanage children but it was also a behavior that improved quite rapidly (Fisher et al., 1997). Only 2% of orphanage children had not improved at all after 11 months in Canada. In some children, however, vestiges of stereotyped behavior persisted: 41% of orphanage children still displayed at least some of this behavior 3 years after adoption, although its frequency had decreased in all children (Ames, 1997). Beckett et al. (2002) also reported a decrease in stereotypies, but 18% of Romanian children in their U.K. sample still rocked at 6 years of age. The degree of improvement was negatively correlated with length of institutionalization (Fisher et al., 1997; Beckett et al., 2002).

Investigators have also examined the question of whether orphanage children experi-

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ence more problems with peers than comparison groups of children. Based on parents' reports when their children had been in Canada for 11 months, Fisher et al. (1997) found that 32% of orphanage children had problems with peers. The most common problems involved either avoiding contact with peers or being overwhelmed by peers' attention, neither of which was reported for either Canadian-born or early-adopted children. Based on both parents' and teachers' reports at 3 years after adoption, orphanage children continued to display more social behavior problems than the Canadian-born children (Ames, 1997). Early-adopted children's scores were intermediate between the other two groups. By the time the orphanage children had been in Canada for 8 or more years, their peer relationships had improved (Warford, 2002). Orphanage children were not different from early-adopted or Canadian-born children on acceptance ratings from their school peers or on their parents' ratings of the number of good friends they had or the ease with which they made new friends. Their feelings of social competence and loneliness were also similar to those of the two comparison groups. On the other hand, orphanage children felt less social support from their peer group or a close friend than did children in the other groups. The longer children had spent in institution, the less peer support they felt.

Another problem area concerns attentional difficulties, which have been reported in children who reside in institutions and in most studies of previously institutionalized children. Vorria, Rutter, Pickles, Wolkind, and Hobsbaum (1998) found that, compared to same-aged peers living at home, 9- to 11-year-old children living in a Greek orphanage were more inattentive and more often engaged in nonproductive activities in the classroom. Parents of previously institutionalized Romanian children who ranged in age from 7 months to 11 years (median age = 3 years) reported high activity levels, inability to attend, and distractibility as ongoing problems in their children (Marcovitch et al., 1995). These findings are consistent with the earlier work of Goldfarb (1945b) who reported distractibility and a lack of concentration among adolescents who had moved from orphanage to foster care at age 3. Chugani et al. (2001) found that ten 7- to 11-year-old children adopted from Romanian orphanages scored on standardized tests in the mildly impaired range on attention and in the severely impaired range on impulsivity.

At 3 years postadoption, orphanage children in the Canadian sample scored higher than comparison group children on the Attention Problems subscale of the CBCL (Ames, 1997). They were also reported by their parents according to the Parenting Stress Index (Abidin, 1990) to be more distractible but not more hyperactive on the Distractibility/Hyperactivity subscale than comparison group children at 11 months after adoption (Mainemer, Gilman, & Ames, 1998) and more distractible and hyperactive than comparison children 3 years after adoption (Ames, 1997). Further support for these findings comes from the U.K. study, in which Kreppner, O'Connor, and Rutter (2001) found that at both 4 and 6 years of age the children who had been adopted from Romania after 6 months of age were rated by both teachers and parents on the Revised Rutter Parent and Teacher scales (Hogg, Rutter, & Richman, 1997) as displaying higher inattention/overactivity than did Romanian children or U.K. children who were adopted before 6 months of age.

The Canadian adoptees from Romania continued to display more attention problems 8 or more years after adoption (Le Mare & Audet, 2002): orphanage children scored higher than both Canadian-born and early-adopted children on the Attention subscale of the CBCL and on the Impulsivity and Inhibitory Control subscales of the Children's Behavior Questionnaire (Ahadi, Rothbart, & Ye, 1993) and lower on the questionnaire's Attention Focusing subscale. These findings were consistent across both parent and teacher reports. Supporting these data was the additional finding that 29% of children in the orphanage group had received a clinical diagnosis of attention-deficit disorder (ADD) or attention-deficit/hyperactivity disorder (ADHD) whereas none of the comparison group children had received such a diagnosis (Le Mare & Audet, 2002).

Across studies, attentional difficulties have been consistently related to the length of time

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that children had spent in orphanage (Kreppner et al., 2001; Le Mare & Audet, 2002; Marcovitch et al. 1997). In addition, Le Mare and Audet (2002) found that children's attentional difficulties at 8 years of age were negatively correlated with their HOME environment scores (Caldwell & Bradley, 1984) at 3 years postadoption. The more nurturing and stimulating the home environment, the fewer attentional difficulties children experienced later. It was not only institutionalization but also the postadoption environment that aided in the prediction of attention difficulties.

In accordance with early studies, the more recent studies of Romanian adoptees have shown that children reared in institutions have more behavior problems than family-reared children, that the number of behavior problems is related to the length of institutionalization, and that some behavior problems last up to 8 or more years after removal from the institution. Fisher et al. (1997) have pointed out that most of the characteristic early problems of children adopted from orphanages might indicate brain damage or emotionally produced pathology if they were found in children reared in families. In orphanage children, however, they seem more correctly characterized as behavioral adaptations to orphanage life. Children who have had inadequate nutrition in orphanage initially overeat until they reach the proper weight. Children who have been fed entirely by bottle for the first 2 years of life resist solid food when it is introduced for the first time. Young orphanage children show the same stereotyped behaviors as family-reared children just starting to sit, stand, or walk (Thelen, 1979), but when restriction to a crib for 18–20 hr/day does not permit them to develop their motor skills (Ames, 1997), these early stereotyped behaviors are practiced for a prolonged period. In the general absence of sensory stimulation and soothing by adults, for example, by rocking, children may learn to provide their own stimulation or soothing by making stereotyped movements. Both eating problems and stereotyped movements decrease with time after adoption, but in each case there remains a small proportion of children who still have the problem several years after leaving the orphanage. What causes some children to have persistent rather than transient problems in these areas is still unknown.

Peer problems are also believed to arise from the characteristics of the orphanage environment. Young children in Romanian orphanages are generally quiet and unresponsive to each other, so after adoption they are wary of and withdraw from family-reared children who are noisier, more active, and more unpredictable than their peers in the orphanage (Fisher et al., 1997). This unwillingness to interact with peers further prevents them from learning normal patterns of social interaction. When they do become comfortable enough to interact with peers in their new environment, they externalize ("act out") in unacceptable ways that do not endear them to those peers. Several years after adoption, they have improved on most indices of behavior with peers but still have externalizing problems and feel less social support from peers or a close friend than family-reared children do.

Even problems in attending may be at least partly explained by the abrupt move from the very low levels of stimulation in the orphanage to the overwhelming sensory stimulation of an adoptive home without any opportunity to gradually learn how to deal with greater sensory complexity. Attention problems may go unnoticed when children are very young, but by preschool age they are apparent, and are often accompanied by hyperactivity. In school years these problems may interfere with academic performance, and even lead to diagnoses of ADD or ADHD.

Indiscriminate Friendliness

Another behavior problem that is particularly enduring in previously institutionalized children is indiscriminate friendliness. Tizard (1977) characterized indiscriminate friendliness as behavior that is affectionate and friendly toward all adults (including strangers) without the fear or caution that is typical in young children. In these cases the children's behavior toward a stranger cannot be discriminated from their behavior toward their primary caregivers. It appears as though any adult is sufficient for the child as long as the

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child's needs are met (Provence & Lipton, 1962). References to indiscriminately friendly behavior were evident in the early literature on the social development of institutionalized children who were later fostered or adopted. Provence and Lipton (1962) followed the progress of 14 previously institutionalized children who had been placed in foster care between 18 and 24 months of age. They reported that these children were indiscriminately friendly to all adults. Tizard followed 24 children who had spent their first 2 years in orphanage and were subsequently either adopted or restored to their biological parents. Based on parents' reports these children displayed indiscriminate friendliness to adults at 4 (Tizard & Rees, 1975) and 8 years of age (Tizard & Hodges, 1978), demonstrating the enduring nature of this behavior. A few adoptees were still indiscriminately friendly with adults at 16 years of age (Hodges & Tizard, 1989). Goldfarb (1955) found that indiscriminate friendliness was still present in adolescents who had been institutionalized as children but who were later fostered to unstable foster care placements.

More recently, researchers have attempted to develop measures of indiscriminate friendliness. Chisholm (1998; Chisholm et al., 1995) developed a 5-item measure of indiscriminate friendliness. Parents were asked five questions assessing (a) whether their child wandered without distress, (b) whether their child was willing to go home with a stranger, (c) how friendly their child was with new adults, (d) whether their child was ever shy, and (e) what their child typically did upon meeting new adults. Orphanage children in the Canadian study displayed significantly more indiscriminate friendliness than both early-adopted and Canadian-born children at both 11 months and 3 years after adoption (Chisholm, 1998). Providing corroborative evidence for this finding, 71% of parents in the orphanage group described their children as "overly friendly." Eight years after adoption, orphanage children continued to display significantly more indiscriminately friendly behavior than the Canadian-born or early-adopted groups of children, who did not differ from each other (Fernyhough, Audet, & Le Mare, 2002).

Further support for the suggestion that indiscriminate friendliness is a characteristic behavior of orphanage children comes from the work of O'Connor and his colleagues in the United Kingdom (O'Connor, Bredenkamp, Rutter, & the ERA Study Team, 1999; O'Connor, Rutter, & the ERA Study Team, 2000). Using a scale of "disinhibited attachment disturbance," which contained three items similar to those used by Chisholm (1998; Chisholm et al., 1995), O'Connor et al. (1999) found that approximately 20% of Romanian children adopted between 6 and 24 months of age had high scores on the scale compared to approximately 10% of Romanian children adopted before 6 months of age and 2% of a group of children adopted within the United Kingdom. O'Connor et al. (2000a) found that high scores were obtained by more 6-year-old Romanian children who had spent between 6 and 42 months in orphanage than by 6-year-olds who had been adopted from either Romania or the United Kingdom before 6 months of age.

Several studies have examined indiscriminate friendliness over time. In the Canadian sample, orphanage children were just as indiscriminate 3 years after adoption as they had been 11 months after adoption, and 90% of parents reported no improvement in this behavior over that period of time (Chisholm, 1998). In contrast, displays of indiscriminate friendliness had decreased over the same time period in the early-adopted Romanian children. In a follow-up study of the Canadian sample more than 8 years after adoption, Fernyhough and colleagues (2002) found a positive correlation between orphanage children's indiscriminate friendliness scores 3 years postadoption and more than 8 years postadoption. There were no differences in children's scores at these two points in time. O'Connor and his colleagues reported a positive correlation between disinhibited attachment disturbance scores at 4 and 6 years of age for Romanian adoptees to the United Kingdom (O'Connor, Rutter, & the ERA Study Team, 2000). Sixty-two percent of children showed no category change ("none," "mild," or "marked") in these behaviors from 4 to 6 years of age.

Unlike the findings for intellectual development and for other behavior problems, there

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is disagreement among studies as to whether there is a relationship between the length of time that children have spent in orphanages (or their age at adoption) and the amount of indiscriminate friendliness they display. O'Connor and his colleagues found modest correlations at both 4 years (O'Connor, et al., 1999) and 6 years of age (O'Connor, Rutter, et al., 2000) between duration of deprivation (age at adoption) and children's scores on disinhibited attachment behaviors in the U.K. group. They pointed out, however, that some children who were adopted after 2 years in Romania showed no signs of disinhibited attachment behaviors and other children who were adopted within the first 6 months of life showed signs of the behavior (O'Connor, Rutter, et al., 2000). Chisholm et al. (Chisholm, 1998; Chisholm et al., 1995), Fernyhough et al. (2002), and Tizard et al. (Tizard & Hodges, 1978; Tizard & Rees, 1975) all found no relationship between length of institutionalization and indiscriminate friendliness.

In an attempt to better understand indiscriminate friendliness, researchers have examined particular correlates that may be associated with this behavior, focusing on aspects of the institutional environment, child characteristics, and family characteristics. In the Canadian sample Chisholm (1998) found that high scores on indiscriminate friendliness 3 years postadoption were positively correlated with the child having been a favorite in the institution. Other measures of the quality of institutions, for example, quality of physical care, whether toys were available (Chisholm et al. 1998), or children's weight or developmental delay at adoption (O'Connor et al., 1999; O'Connor, Rutter, et al., 2000) were unrelated to children's indiscriminate friendliness.

Particular characteristics of the child after adoption have also been examined as correlates of indiscriminate friendliness. Researchers have consistently found associations between orphanage children's indiscriminate friendliness and their behavior problems. Chisholm (1998) found that at 3 years postadoption, children's indiscriminate friendliness scores were positively correlated with their scores on the CBCL. Le Mare and Audet (2002) found that children's scores on indiscriminate friendliness at 3 years after adoption were positively correlated with their attention problem scores more than 8 years after adoption. Consistent with the Canadian findings, in the U.K. sample children's scores on disinhibited attachment disturbance were positively correlated with their scores on hyperactivity and disruptive behavior measures at age 4 (O'Connor et al., 1999) and hyperactivity, disruptive behavior, and emotional difficulties measures at 6 years of age (O'Connor, Rutter, et al., 2000).

In contrast to behavior problems, IQ does not appear to be strongly related to indiscriminate friendliness. In the Canadian sample, Chisholm (1998) found no association between children's IQ scores at 3 years postadoption and their displays of indiscriminate friendliness. Consistent with Chisholm's finding, O'Connor et al. (1999) found no correlation between children's IQ scores and disinhibited attachment disturbance when the children in the U.K. sample were 4 years old. In their follow-up study when children were 6 years of age, O'Connor, Rutter, et al. (2000) reported a significant correlation between disinhibited attachment disturbance and IQ; but this relationship was no longer significant when the analysis was controlled for age at adoption, suggesting that both IQ scores and disinhibited attachment behavior were the result of duration of deprivation.

Researchers do not yet have a clear understanding of indiscriminate friendliness. Unlike many of the initial behaviors of concern in institutionalized children, displays of indiscriminate friendliness do not appear to dissipate over time but are still in evidence up to 8 years after leaving the orphanage environment (Fernyhough et al., 2002; O'Connor, Rutter, et al., 2000) and may persist even longer (Goldfarb, 1955). Chisholm (1998) has suggested that indiscriminate friendliness may serve an adaptive function in the context of the orphanage environment where emotional resources are extremely limited. Amid the passivity of the orphanage an indiscriminately friendly child may receive what little attention caregivers have to offer. The fact that indiscriminate friendliness was associated with having been a favorite in the orphanage supports

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this contention but does not explain what function such behavior serves after adoption. It may be behavior that is reinforced by both parents and strangers. Chisholm et al. (1995) reported that at 11 months postadoption, parents were pleased that their child appeared to be fond of everyone. According to parents' reports newly adopted orphanage children were often approached, talked to, and hugged by total strangers, so it is not difficult to imagine that they felt that such behavior was appropriate.

Given that indiscriminate friendliness in orphanage children has been consistently associated with attentional difficulties like distractibility, lack of focus, impulsivity, and lack of inhibitory control, to some extent it may reflect the expression of those difficulties as applied to interactions with strangers. On the other hand, Chisholm et al. (1995) suggested that indiscriminately friendly behavior is not unlike the indiscriminate behavior seen in infants prior to the formation of an attachment relationship and thus may reflect a delay in the attachment system. O'Connor et al. (1999) also suggested that indiscriminate friendliness may represent a form of developmental delay in the attachment behavioral system, although their use of the term "disinhibited attachment disturbance" seems to suggest attention problems as well as involvement of the attachment system.

Indiscriminate friendliness is particularly relevant to the study of attachment, given suggestions that this behavior may be indicative of "nonattachment" (Lieberman & Pawl, 1988) or the disinhibited/indiscriminate subtype of reactive attachment disorder (Zeanah, 1996, 2000). Both Lieberman and Pawl (1988) and Zeanah (2000) described these disorders as resulting from an infant not having had the opportunity to form an attachment relationship. This is precisely the situation of children reared in orphanage environments, so researchers have focused on linking this behavior to children's attachment. Chisholm (1998) found that the two most extreme items on her measure of indiscriminate friendliness (i.e., being willing to go home with a stranger and wandering without distress) were associated with insecure attachment in the Canadian sample. These were items that most clearly capture secure base behavior. Similarly, O'Connor et al. (2003) reported that children in their sample who scored high on their Disinhibited Attachment Disturbance scale were overwhelmingly classified as Insecure/Other in terms of their attachment patterns. Two of the three items on O'Connor's scale (readiness to go off with a stranger, failure to check back with parent in new anxiety provoking situations) appear to measure the same behaviors as Chisholm's two extreme items. Although orphanage children in the Canadian sample scored higher than comparison groups on each of the five items on the indiscriminate friendliness measure, the other three items on the scale (i.e., being friendly with new adults, never having been shy, and eagerly approaching new adults) were not associated with children's insecure attachment patterns and may measure simple uninhibited friendliness rather than involvement of the attachment system.

Both Chisholm (1998) and O'Connor et al. (2003) found some securely attached children who are indiscriminately friendly, and Marcovitch et al. (1997) reported that some securely attached children were observed to be extremely friendly to the stranger in the Strange Situation. It seems unlikely, therefore, that indiscriminate friendliness necessarily indicates an attachment disorder (Chisholm, 1998).

In summary, research has shown that indiscriminate friendliness is a common characteristic of previously institutionalized children, which persists years after removal from orphanage. In contrast to the negative relationships found between length of institutionalization and orphanage children's height, IQ, academic achievement, and behavior problems, the relation of length of institutionalization to indiscriminate friendliness has been found across studies to be weak or nonexistent.

Indiscriminate friendliness has little or no relation to IQ, but it is positively correlated with behavior problems, especially problems of attention. To some extent, therefore, it may reflect distractibility and impulsivity as applied to interactions with strange adults. It also has been theorized to represent a failure or developmental delay in attachment. The finding that only those indiscriminate friendli-

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ness measurement items reflecting lack of secure base behavior, and not those reflecting eager approach and engagement with new adults, are related to insecure attachment suggests a possible differentiation of two components of indiscriminate friendliness: uninhibited friendliness toward all adults and lack of the secure base behavior characteristic of attachment. How distinguishable these two components are in terms of their antecedents and consequences remains to be explored further.

Attachment

Researchers have focused enormous energy on attempting to evaluate the impact of institutionalization on the ability of children to form attachment relationships. Given that attachment usually develops some time during the second half of the first year of life (Bowlby, 1969/1982) children who have been housed in institutions during the first year or 2 of life necessarily develop an attachment relationship with adoptive parents later than is typical. Although little evidence exists on this point, most researchers have assumed that the children would have been unlikely to have developed an attachment relationship with caregivers within the institution, given the very high child to caregiver ratios within institutions (Chisholm, 1998). In Romanian orphanages the child to caregiver ratios ranged from 10 to 1 for children under 2 years of age to as high as 20 to 1 for children over 3 years of age. It is unlikely that caregivers in such a context would have had time to spend in sensitive responsive care with particular children (Chisholm, 1998).

Tizard has been the only researcher who examined children's behavior toward their caregivers within the institution context. Tizard and Tizard (1971) found that when comparing children in institution to family-reared 2-year-olds, a list of preferred persons could easily be constructed for family-reared children whereas lists of preferred persons for children from institutions included anyone that children knew well. The only "favorite" people in children's lives were people they saw rarely (i.e., a parent who visited), but such persons were the only ones who provided one-on-one attention to children. Tizard and Rees (1975) described 4-year-old children's behavior toward their caregivers as very clingy but claimed that the children did not care deeply about anyone. By the time the children were 8 years old there were only 7 institution children left to study and only a minority of them were suspected to have formed any attachment to their institutional caregiver. This work provides the only direct evidence that institutionalized children would have been unlikely to have the opportunity to form an attachment with their caregivers.

Chisholm (1998) suggested that there are reasons to suppose why developing an attachment relationship may be more difficult for previously institutionalized children. According to attachment theory, a child's attachment behavior becomes organized toward a particular caregiver sometime between 6 and 12 months of age (Bowlby, 1969/1982). An adequate caregiver readily responds to an infant's needs for close contact and understands an infant's distress if separated from the caregiver. When a child is beyond 2 years of age, caregivers may be less responsive to the child's needs for close contact and may expect him or her to display more autonomy. The child's need for contact may be viewed as "clingy" rather than "cuddly" behavior, and a parent may not be as patient with such behavior. Given that attachment theory suggests that sensitive responsiveness predicts the quality of the attachment relationship (Ainsworth, Blehar, Waters, & Wall, 1978; DeWolff & van IJzendoorn, 1997), if a caregiver is less responsive, developing an attachment relationship later may be more difficult. Chisholm et al. (1995) also reported that children from institutions did not initially display proximity-promoting behaviors like smiling, crying, and making eye contact, behaviors that often promote contact with caregivers. Parents in the Canadian sample reported that when they first met their children fewer than half of the children would smile back at someone who smiled at them. Based on parents' reports at 11 months postadoption, 14% of children did not show signs of experiencing pain and 31% of children would not signal parents upon waking (Chisholm et al., 1995). The absence of such

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behavior may also make it difficult for parents to know when and how to respond appropriately to their children. A third reason why developing an attachment may be difficult is because of the neglect children experienced in the institution. As a result they may have developed expectations of others as untrustworthy, and this might promote difficult or passive interaction styles that would have a negative impact on a parent's ability to be sensitively responsive.

Findings in the early literature were inconsistent regarding whether institutionalized children were capable of forming an attachment with their adoptive parents. Goldfarb (1943a) found that the majority of 10- to 14-year-olds who had been in orphanage for the first 3 years of life and were later removed to foster homes were described as withdrawn and "removed" with both family members and their caseworkers, and appeared unperturbed by either threats of removal from the home or changes in foster care placements (Goldfarb, 1945b). None of the comparison children who had spent their lives in foster care were described in this way. Goldfarb concluded that orphanage children were unable to develop attachment relationships with their foster parents and that the effects of institutionalization were permanent. In contrast to Goldfarb's work, Tizard (1977) concluded that children could become attached to parents after leaving an institution. In her sample, 20 of 25 children were reported to have formed an attachment relationship with their adoptive parents within a year of leaving the institution and a majority of parents reported that their child was deeply attached to them.

Ames and Chisholm (2001) have suggested several reasons for these inconsistent findings. First, the conditions in the orphanages studied by Goldfarb were much worse than the conditions in the Tizard study. Children in Goldfarb's sample were delayed in every area of development. In contrast, children in Tizard's sample were chosen for good health and had average IQs when they left the institution (Tizard, Cooperman, Joseph, & Tizard, 1972). These factors would bode well for the formation of an attachment relationship with parents. Second, it is unclear from Tizard's reports whether children had truly been unable to form an initial attachment with caregivers in the institution. Tizard and Rees (1975) reported that even though the institutions maintained a policy that discouraged caregivers from forming relationships with particular children, there were some indications that children did have preferences among their regular caregivers. Perhaps most important, there was a radical difference between the two studies in terms of the stability of placement for the children postinstitutionalization. Children in Goldfarb's study very often went to unstable foster care placements. By the time children were between 10 and 14 years of age they had experienced care in three or four different foster homes (Goldfarb, 1943a). It is likely that having experienced a series of broken attachment relationships contributed to children's emotional coldness. Children in Tizard's sample, however, went to stable adoptive homes, evidenced by the report that only 14% of adoptive placements had broken down by the time children were 16 years old (Hodges & Tizard, 1989).

More recently, researchers have examined attachment in previously institutionalized children using standard separation reunion procedures and relying on validated attachment coding systems (Chisholm, 1998; Marcovitch et al., 1997; O'Connor et al., 2003). In each of these studies researchers used a separation reunion procedure with preschool-aged children in which children first interacted with their mothers in play, stayed in the same room with a stranger while their mother left, and then were reunited with their mothers. This procedure was carried out in children's homes by both Chisholm (1998) and O'Connor et al. (2003), but Marcovitch et al. (1997) carried out the procedure in a hospital laboratory. In all studies children's behavior during this procedure was videotaped and then coded by trained coders for quality of attachment. Chisholm (1998) used Crittenden's (1992a) Preschool Assessment of Attachment (PAA) to code preschool attachment patterns, whereas both Marcovitch et al. (1997) and O'Connor et al. (2003) used the Cassidy, Marvin, and MacArthur Working Group (1992) Preschool Attachment System. Both of these coding sys-

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tems have reported validity (Solomon & George, 1999).

Marcovitch et al. (1997) examined attachment in a sample of 4-year-old Romanian children adopted to Canada who had spent 6 months or more in an institution (institution group) and compared them to Romanian children who had spent less than 6 months in institution (home group). A second comparison group comprised healthy 4-year-old Canadian children. O'Connor et al.'s (2003) sample comprised two groups of 4-year-old children adopted from Romania, one group adopted before 6 months of age and the other adopted between 6 and 24 months of age. Most, but not all, of these children had been adopted from orphanages. The comparison sample comprised U.K. born children who were adopted before 6 months of age. Chisholm examined attachment in 30 orphanage children aged 54 months and 13 orphanage children who ranged in age from 65 to 110 months. Each of these children had spent between 8 and 53 months in orphanage. These children were individually matched on age and sex to children in the early-adopted (adopted before 4 months of age) and Canadian-born comparison groups, and groups did not differ on family demographic variables.

Across all three studies there was no evidence of a child being unattached to his or her caregiver. It is important to note, however, that the coding systems used were initially designed to evaluate the quality of attachment rather than the presence or absence of an attachment relationship. Nevertheless, children's attachment patterns were related to other measures in ways consistent with attachment theory, which provides some construct validation for use of these measures with institutionalized children (Chisholm, 1998; O'Connor et al., 2003). Chisholm (1998) found that, compared to orphanage children classified as secure, those who were classified as insecure had lower IQs, more behavior problems, parents who reported higher levels of parenting stress, and lower socioeconomic status backgrounds. Each of these variables has been associated with insecurity in previous studies of attachment (Greenberg, 1999; Teti, Gelfand, Messinger, & Isabella, 1995; van IJzendoorn, Dijkstra, & Bus, 1995). In addition, in all three studies (Chisholm, 1998; Marcovitch et al., 1997; O'Connor et al., 2003), fully one third of children were classified as securely attached. This clearly argues against the Goldfarb contention that children from institutions are unable to form an attachment relationship with their adoptive parents.

On the other hand, it is clearly the case that across studies the percentage of securely attached children in any previously institutionalized sample was lower than the percentage of secure children in any comparison sample (Chisholm, 1998; Marcovitch et al., 1997; O'Connor et al., 2003). The one exception to this general conclusion is that no differences were found in the Marcovitch study between their institution and home groups. Ames and Chisholm (2001) have suggested that failure to find a clear difference between these groups may be due either to the small number of children in the sample who had more than 6 months of institutionalization or to the mixed backgrounds of the home sample. The only criterion for inclusion in the home group was that children had spent less than 6 months in either a hospital or orphanage in Romania. There may have been some children in the home group who had spent close to 6 months in orphanage and therefore there would be little difference in the amount of institutional experience between the two groups.

In all three studies a large percentage of previously institutionalized children had attachments to their primary caregivers that were either secure or typical insecure (i. e., insecurely attached in a manner that is common in normative North American samples). In Chisholm's (1998) study, 67% of the orphanage children had either secure or typical insecure attachment patterns. In other words, they had developed attachment patterns that were identical to those displayed by 95% of the Canadian-born and early-adopted children. This finding suggests that in spite of having spent 8 months or more in an extremely depriving environment and developing an attachment later than is typical, most orphanage children were still able to form an attachment relationship with their adoptive parents that

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was similar to those found in normative samples.

It was also the case in all three studies, however, that a considerable number of orphanage children had developed very unusual and atypical insecure attachment patterns with their adoptive parent, which were rare in comparison group children. Chisholm (1998) reported that 33% of her orphanage sample had developed an atypical insecure attachment pattern, as compared to 7% of Canadian-born and 4% of early-adopted children. In parallel to Chisholm's findings, both O'Connor et al. (2003) and Marcovitch et al. (1997) found that slightly over 40% of their orphanage samples had developed an atypical insecure attachment pattern. Such atypical insecure patterns are rare in normative samples and are found more commonly in clinical samples of maltreated children (Carlson, Cicchetti, Barnett, & Braunwald, 1989; Cicchetti & Barnett, 1991; Crittenden, 1988; Lieberman & Zeanah, 1995). Some researchers have suggested that such attachment patterns may be risk factors in the development of psychopathology (Carlson & Sroufe, 1995).

The distribution of atypical patterns in previously institutionalized children is not the same as in other maltreated samples. One difference is that orphanage samples display a lower percentage of the Defended/Coercive (A/C) insecure pattern than do other maltreated samples. A child classified as A/C shifts back and forth between defended and coercive strategies in response to the behavior of an often unpredictable caregiver. Twelve percent of the Canadian orphanage sample was classified as A/C. Whereas this percentage is higher than is found in normative samples of children, it is far lower than the 58% of A/C patterns reported by Crittenden (1988) and the 27% reported by Cicchetti and Barnett (1991) for maltreated children who have come to the attention of social services. The characteristics of the parents may explain this difference between institutionalized samples and other maltreated samples of children. In maltreated samples, children are subjected to abuse and/or neglect at the hands of their attachment figures and have developed a flexible, organized strategy for coping with an abusive caregiver. This is not the case for most previously institutionalized children: although orphanage children have experienced extreme neglect, it was not perpetrated by their postadoption attachment figures.

Orphanage children in the Canadian sample also displayed a higher percentage of compulsive caregiving (A3), a pattern more commonly seen in neglected samples than in abused samples of children (Crittenden & Claussen, 2000). Twelve percent of orphanage children displayed a compulsive caregiving pattern, as compared to 4% of early-adopted Romanian children and 2% of Canadian-born children. The compulsive caregiving pattern is adopted in response to a withdrawn or unresponsive caregiver. A child displaying an A3 pattern inhibits negative affect and attempts to cheer an unresponsive caregiver with overbrightness and nurturance (Crittenden, 1992a). Crittenden suggested that in the case of neglect, such a strategy increases the likelihood of a child gaining the parents' attention. Children's experience of extreme neglect earlier in their lives may have resulted in their developing a compulsive caregiving strategy that would ensure they received what little attention was available to them in the orphanage context. For some children, this seems to continue in their adoptive homes, especially if a parent is withdrawn because of the burden of dealing with the child. Chisholm (2000) described such a case in which an overburdened parent was withdrawn and unresponsive in interaction with her child. The child displayed false, overbright affect and took most of the responsibility for maintaining the interaction with the parent. This child was classified as compulsive caregiving (A3) and may have implemented such a strategy because of his experience of extreme neglect in orphanage, experience with an unresponsive caregiver, or both.

Another difference is that the Insecure (other) pattern is more common in orphanage samples than in maltreated samples. Insecure (other), by definition indicates behavior that is difficult to classify. This classification is given when a child is clearly insecure, but the strategy that he or she uses in interaction does not fit any of the established insecure patterns. Nine percent of the Canadian orphanage

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sample was classified as Insecure (other), whereas Crittenden (1992a) only found 3 or 4 out of 100 maltreated children classified as Insecure (other).

Such atypicality in orphanage children's attachment was also apparent in the attachment patterns of orphanage children classified as secure. The PAA (Crittenden, 1992a) has a secure classification labeled "Secure (other)." This classification is given when children are clearly secure but the strategies they use in interaction with their caregiver do not reflect any of the standard subpatterns of secure. Crittenden has not reported any children classified as Secure (other) in her published results (Crittenden, 1985, 1988, 1992b; Crittenden, Partridge, & Claussen, 1991) with maltreated samples, and Teti and his colleagues (Teti et al., 1995) reported only 1 child classified as "Secure (other)" in their sample of 54 children of depressed and nondepressed mothers. In the Canadian sample (Chisholm, 1996) only 1 of the 42 children classified as secure in the comparison groups was classified as Secure (other), but 37.5% of the 16 secure orphanage children were classified as Secure (other). This represents a much higher percentage of Secure (other) children than is found in the literature on other high risk samples using the PAA.

This finding suggested the possibility that the coding systems that were developed using normative samples of children were inadequate to evaluate attachment in institutionalized samples, that is, that children classified as Secure (other) might not truly be secure. Chisholm (1996) compared Secure (other) children to both the remaining secure children and to children classified as Insecure (other) to find out which of these groups they resembled more. (It is important to note that all attachment coding was done by two independent coders who were blind to children's group membership and all other behavior besides attachment.) Secure (other) children did not differ from secure orphanage children on behavior problems, parenting stress, or indiscriminate friendliness, but they did have lower IQs than secure orphanage children. In contrast, they differed greatly from children classified as Insecure (other), scoring lower on behavior problems, parenting stress, and indiscriminate friendliness and higher on IQ. Chisholm (1996) concluded that Secure (other) children were more similar to children classified as secure than to children classified as Insecure (other). This suggests that the PAA is able to classify children appropriately as secure and insecure, and yet reveals that orphanage children may display even secure patterns of attachment differently from both normal samples and noninstitutional, high-risk samples of children. For example, in a case study Chisholm (2000) described the behavior of a previously institutionalized child who had been classified as Secure (other). During a separation–reunion procedure the child's interaction with her mother was warm and relaxed, prior to separation there were clear indicators of open negotiation regarding the separation, and negative feelings upon reunion were openly resolved. The behavior that contributed to the Secure (other) classification and set her apart from other secure children was her behavior toward the stranger. The child initiated all interaction with the stranger, watched the stranger quite openly, and at one point left the interaction with the parent to search out the stranger. This is clearly not behavior that would be displayed by a child classified as typically secure. However, we cannot assume that, because the behavior of orphanage children may manifest itself in somewhat different ways in the context of a separation–reunion procedure, they are necessarily insecure. This is an important way in which orphanage children have reshaped our thinking about the meaning of behavior in the context of procedures that were developed with normative samples.

Bowlby claimed that the development of a first attachment relationship occurs sometime during the second half of the first year of life (Bowlby, 1969/1982) and therefore it was only after this time that separation from an attachment figure would be psychologically harmful. He reported that infants who had been adopted between 6 and 9 months of age often showed little or no socioemotional damage. The findings from orphanage samples concur with Bowlby's theory and with studies from noninstitutionalized samples. In all three Romanian studies, children who were removed

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from the institution prior to the time when attachment is expected to develop (Chisholm's (1998) "early-adopted" group, adopted before 4 months; Marcovitch et al.'s (1997) "home" group, adopted before 6 months; and O'Connor et al.'s (2003) "early-placed" group, adopted before 6 months) were no more likely to develop insecure attachment relationships than children who were never institutionalized. Institutionalization, even under the extremely poor conditions found in Romania, does not appear to have an impact on attachment when it ends before the appropriate time for such development. Thus, there is theoretical and empirical agreement concerning the *onset* of a possible sensitive period for attachment.

Bowlby (1969/1982) felt that a child was maximally ready to become attached quickly at least through the end of the first year, but thereafter attachment would be more difficult (e.g., require a longer time or better parenting or take a less adaptive form). In both the Canadian and U.K. samples (Chisholm, 1998; O'Connor et al., 2003), children who had experienced more than 6 months of institutionalization, that is, children who remained in institution without a primary caregiver at the time when a first attachment would have been expected to develop, were more likely to be insecurely attached than comparison group children.

In other areas of child development the impact of institutionalization has been shown to depend on how long a child has spent in the institution. In terms of attachment this association has not been found. Chisholm et al. (1995) did not find a relationship between orphanage children's age at adoption and parents' reports of their children's attachment security 11 months postadoption. In a follow-up study using a separation reunion procedure to measure attachment patterns when children were 4.5 years or older, previously institutionalized children classified as insecure were no more likely than previously institutionalized children classified as secure to have spent a longer time in institution or to have been older when they were adopted (Chisholm, 1998). Thus, examination within the orphanage group did not reveal an association between children's attachment patterns and the length of time they had spent in institution. This agrees with Tizard and Hodges (1978), who did not find a relationship between whether a parent considered his or her child to be attached at 8 years of age and the length of time the child had spent in institution: the majority of children who had spent at least 4.5 years in institution were reported to be closely attached to their parent at 8 years of age.

Given the lack of a general relationship between length of institutionalization and the quality of relationships that children later form with their adoptive parents, it remains unclear whether there is a length of time beyond which developing a secure attachment relationship may become impossible. Bowlby initially claimed that if the opportunity to form an attachment was delayed until after the age of 2.5 years, it was "almost useless" (Bowlby, 1953), thereby implying a short window of opportunity for developing attachment. As Bowlby's theory developed, the length he attributed to this sensitive period increased. By 1973, he claimed that the sensitive period for attachment likely extended through the decade beyond a child's fifth birthday, but that such development would become increasingly more difficult as a child grew older. This was in line with a more modern emphasis on risk and resilience in a probabilistic, rather than deterministic, model of development (Rutter & O'Connor, 1999).

Ames and Chisholm (2001) have noted that the statistical analyses used in most studies do not enable an examination of such a "sensitive period" hypothesis. They claim that such a hypothesis is better examined by a careful inspection of data rather than by either correlations (that investigate how well data fit a straight line) or average differences between age groups. In a reanalysis of the Chisholm (1998) data, Ames and Chisholm (2001) found that the median and ranges of length of institutionalization were 16.5 (range = 9–39 months) for orphanage children subsequently classified as secure; 14 (range = 9–53) months for children classified as typical insecure; and 21 (range = 8–53) months for children classified as atypical insecure. These differences were not statistically significant, but it is important to note that the oldest children who had de-

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veloped a secure attachment relationship with an adoptive parent had spent only 39 months in an orphanage. In this sample there were only 5 children who had spent more than 39 months in an orphanage. All of those children had developed an insecure attachment relationship, and 4 of the 5 had an atypical insecure attachment. It is clear that on the basis of 5 children no firm conclusions can be drawn concerning the end of a sensitive period for the development of a first attachment. Moreover, the insecure attachments that children developed were also associated with particular factors of both the child and the parent, suggesting that the insecurity of attachment might be associated with those factors rather than with any upper limit on the timing of a period for the formation of a first attachment.

Characteristics of both the child and the parent have been associated with attachment security. Children with lower IQs (Chisholm, 1998; Tizard & Hodges, 1978) and more behavior problems (Chisholm, 1998; Marcovitch et al., 1997) have more difficulty forming attachment relationships with their adoptive parents, most likely because these factors interfere with parents' ability to be sensitively responsive to their children. Ames and Chisholm (2001) found another factor that may have interfered with parents' ability to be sensitively responsive. Although only 14% of securely attached and typical insecurely attached children were adopted by families that had adopted another Romanian child at the same time, 57% of children classified as Atypical Insecure had a sibling who had been adopted from Romania at the same time. Additional family factors that were associated with children's insecure attachment patterns were lower socioeconomic status and a higher level of parenting stress (Chisholm, 1998). These stressors are among those believed by Belsky (1999) to have a negative impact on parents' ability to be sensitively responsive to their infants.

These factors may help to explain the insecure attachments of the oldest five children in the Ames and Chisholm (2001) reanalysis. All five of these children had IQ scores lower than 85, and four of the five came from families whose income was lower than the average for the orphanage group as a whole. Three of these children scored above the clinical cutoff on behavior problems, and three of the four for whom parenting stress scores were available had higher than average parenting stress scores for the orphanage group. Three of them had a sibling who was adopted from Romania at the same time. All of these factors would undoubtedly compromise their parents' ability to respond sensitively to them. Therefore, rather than assume that length of institutionalization per se explains their lack of secure attachment, it appears more reasonable to suggest that they were adopted into families in which the resources were not sufficient to allow parents to provide children who had many problems with the high level of sensitive responsiveness that would be required to develop a secure attachment.

The suggestion that stressors that interfere with parents' sensitive responsiveness negatively affect children's attachment fits with Tizard and Hodges' (1978) findings with a group of children who had been admitted to institution before 4 months of age and had remained there until at least two years of age. Between 2 and 4 years of age, 24 of the children were adopted out of institution and 15 children were restored to their natural families. In comparing the adoptive and restored groups of children, Tizard and Hodges (1978) found that whereas 84% of adoptive mothers felt that their child was deeply attached to them, only 54% of mothers of restored children felt this was the case. Children in the restored group were reunited with their biological mothers who often were ambivalent or reluctant to have their child return home. When compared to children in the adopted group, restored children typically were returned to families who had a larger number of children (Tizard & Hodges, 1978), whose mothers were younger and whose fathers had jobs of a lower socioeconomic status (Tizard & Rees, 1974). Parents of restored children also spent less time in play and educational activities with their children than parents in the adoptive group (Hodges & Tizard, 1989). In contrast, adoptive parents wanted their children and devoted a great deal of time to them. Tizard and Hodges (1978) concluded that forming a secure attachment relationship did not

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so much depend on institutionalization as on the "willingness of the new parents to accept a dependent relationship and to put a lot of time and effort into developing it" (p. 115).

To summarize: it is very rare to find children who have received so little one-on-one attention from adults as children reared in the extremely deprived environment of orphanages. Therefore, studies of institutionalized children have provided researchers with a unique opportunity to examine the development of a first attachment beyond the time it appears in family-reared children. Early researchers disagreed as to whether previously institutionalized children were able to form an attachment relationship with their adoptive parents, but this disagreement was likely the result of conditions in the institution and the post institutional environment, both of which varied widely across studies. Goldfarb (1943a, 1945b) provided the most pessimistic view by claiming that after the experience of early institutionalization children were incapable of forming attachment relationships. He, however, studied children who were housed in very poor-quality institutions and who subsequently experienced several foster home placements. In contrast, Tizard and Hodges (1978) were optimistic and claimed that even after 4.5 years in institution children were capable of forming attachment relationships. They, however, studied children from orphanages in which the conditions were far superior to the conditions found in Romania, and the children in Tizard's studies were typically adopted into stable homes in which parents were highly invested in them.

Recent studies of attachment in previously institutionalized Romanian children are consistent in indicating that after children have been in institution for many months without an opportunity to form an attachment relationship they are able to form attachments with their adoptive parents, and that furthermore, a third or more of these attachments are secure. Attachments in previously institutionalized children may be slower to develop, and a higher percentage of orphanage children than family-reared children form insecure attachment relationships, but almost two-thirds of children from orphanages are able to form attachments that are similar to those found in normative samples. The remaining third show quite atypical attachment patterns, and the types of atypical patterns they display differ from other maltreated samples. It is worth noting the value of the Secure (other) classification that is included in Crittenden's (1992b) PAA system. Although coders were blind to children's group membership, they were able to discriminate between the Secure (other) and Insecure (other) patterns. This provides construct validity for the PAA system and accentuates the importance of the Secure (other) pattern in examining attachment in atypical samples. Even when children have atypical ways of showing a secure attachment, they can be accurately coded as secure.

The length of institutionalization for children who remained in institution beyond the first half of the first year of life does not appear to be related to the quality of the attachment relationship that they subsequently formed. Chisholm (1998) found that after 3.5 years or more of orphanage life, children were able to form attachments with their adoptive parents. One child who spent 39 months in orphanage had developed a secure attachment, and another child who had spent 53 months in orphanage had developed a typical insecure attachment. The majority of adoptive parents in Tizard's sample whose children had spent 4.5 years in orphanage claimed their child was deeply attached to them a few years after adoption (Tizard & Hodges, 1978). We do not yet know whether the period during which attachment is possible might be extended through adolescence, as Bowlby (1988) has suggested, or whether there is an earlier time after which the development of attachment becomes impossible.

It is probably better at present to conceive of attachment formation as being related to factors that compromise the ability of parents to be sensitively responsive to their child, rather than to some age-based offset of a sensitive period for formation of a first attachment. Such factors include the child's lower IQ, more behavior problems, and the adoption of more than one child at a time. High levels of parenting stress and lower socioeconomic status also compromise parents' ability to

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handle children's problems. All of these influences on the attachment relationship can be considered using a transactional argument (Cicchetti, 1996; Sameroff, 1983). As a result of the orphanage experience, children arrived in their adoptive homes with medical, physical, intellectual, and socioemotional problems that undoubtedly led to more stress for their parents; such stress interfered with parents' ability to respond sensitively to their child's cues, which led to more problems on the part of children and the further compromise of the attachment relationship. It could be argued then that it takes more than "good enough" parenting to promote secure attachment in previously institutionalized children, particularly when they present with a myriad of problems and family resources are limited in terms of dealing with such problems.

Discussion

The methodological problems of studies of institutionalized children are many and complex. Measures that were standardized on nonclinical or even clinical populations sometimes are not appropriate for the institutionalized sample. In the study of Romanian orphans adopted to Canada it has sometimes proven necessary to go to the level of subscales or even individual items to clarify what is happening. This creates a problem of multiple comparisons, and it is certainly not recommended that researchers routinely look at group differences on all items. But when there is a reason for separating items that have been grouped together in measures standardized on noninstitutional populations, the researcher must go beyond merely reporting the scale scores yielded by the standardized test. For example, Mainemer et al. (1998) found that adoptive parents scored their previously institutionalized children higher on the Distractibility/Hyperactivity subscale of the Parenting Stress Index (Abidin, 1990) than did parents of Canadian-born children. There was nothing in parent interviews or in home visitors' observations, however, that pointed to orphanage children being hyperactive (indeed, they were generally described as being fairly passive and quiet); and when the index Distractibility/Hyperactivity subscale was divided into two sets of items, it was found that parents of orphanage children perceived them as more distractible but not more hyperactive. Later, as the children spent more time in their adoptive homes, they added hyperactivity to the distractibility. This result helped to explain what appeared to be contradictory findings in the earlier literature, with previously institutionalized children having been reported to be both very passive and very active (Goldfarb, 1943b, 1945a).

A similar example of the poor fit of a standardized measure was found when the CBCL was used to rate orphanage children. Fisher et al. (1997) found that 11 months after adoption orphanage children scored higher on Internalizing, but not on Externalizing, than did comparison children. At 3 years after adoption, however, they scored higher on Externalizing but not Internalizing (Ames, 1997). Because observers and parents had reported that the children still had several unusual behaviors, the individual items that made up the Internalizing scale at the early age were traced and it was found that at the later testing the orphanage children still showed their earlier specific "internalizing" behaviors (stares blankly, strange behavior, acts too young, speech problems) even though those items had shifted onto different subscales in the CBCL version used to test older children.

Although standardized measures require care when applied to institutionalized children, studying variables that do not have standardized measures requires the development of new measures that lack proven validity. Such was the case with measures of Indiscriminate friendliness, which is a strong characteristic of orphanage children. Both the Canadian study (Chisholm, 1998; Chisholm et al., 1995) and the U.K. study (O'Connor et al., 1999, O'Connor, Rutter, et al., 2000) developed measures of descriptively similar behavior, but the measures are slightly different and have been given different names (Chisholm's "indiscriminate friendliness" vs. O'Connor's "disinhibited attachment disturbance"), which indicate the researchers' preferences for the

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measure's theoretical relationship or lack of relationship to attachment. The difference in theoretical emphasis between the measures is likely to generate fruitful research in the future.

Although there is the temptation to claim that samples of previously institutionalized children can address questions concerning sensitive periods in development, the answers that can be provided are limited. Ames and Chisholm (2001) have discussed the difficulties of trying to use studies of postinstitutionalized children to demonstrate the presence or absence of sensitive periods. To prove that a sensitive period exists it is necessary to show both the exact ages that are important and the length of time the operative factor (in this case, institutionalization) must be in place for effects to occur. To conclude that it is deprivation during a particular age period that matters, it is necessary to demonstrate not only that a shorter duration of deprivation is insufficient to produce the same effect but also that the same duration would not have the same effect at another time of life. This requires studies that systematically vary not only the age at which deprivation begins but also the duration of deprivation at each of those ages, something that does not occur in experiments in nature.

In spite of the challenges of interpretation and the methodological differences among studies of previously institutionalized children, the results across studies are consistent in showing that institutionalization has a powerful impact on all aspects of children's development. When compared to either other adopted children or children home-reared since birth, orphanage children have lower IQs, are shorter and weigh less, and have more behavior problems and attention difficulties. They are also more indiscriminately friendly and have more insecure attachments. There is not an area in which orphanage children remain unscathed. What is yet to be specified are the antecedent factors inherent in an institutional upbringing that explain these powerful outcomes. There is some evidence that the quality of the institution makes a difference to developmental outcomes. Morison and colleagues (1995) found that the availability of toys and having been a favorite in the institution were associated with fewer delays among orphanage children, whereas having been described as dirty when first met by parents was associated with more delays. It is unclear, however, whether one or more institutional factors explain delays in all areas or whether there are specific factors that are associated with outcomes in specific areas. For example, intellectual delay may be explained either by the impact of malnutrition on brain development or by the lack of cognitive stimulation in the orphanage environment or by both factors operating together.

Given the profound general deprivation that often characterizes orphanages, researchers have been unable to specify which aspects of deprivation caused the outcomes that have been found. The only exception is Tizard's work (1977) with orphanage children in the United Kingdom, who experienced only social emotional deprivation but were well cared for otherwise. We know from this work that providing good nutrition and cognitive stimulation can prevent developmental delays. These same children, however, still displayed indiscriminate friendliness and some difficulties in attachment, which seem attributable to the limitation of not having had a close personal relationship with an adult caregiver. Presently we simply do not know enough about conditions in orphanages. Careful observational studies of children's lives in different orphanage settings are sorely needed in order to identify more clearly the particular factors in the orphanage environment that have an impact on developmental outcomes. Future research studying samples of children from orphanages in other countries where conditions differ in nutrition, access to children of different ages, child to caregiver ratios, attitudes of caregivers toward children, and number of toys available, may be better able to isolate particular antecedents that explain specific post institutionalization outcomes. At the same time it is important for current longitudinal studies to continue so that the long-term effects of early institutionalization can be examined. Current studies are presently reporting findings 10 to 11 years after

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institutionalization. This work will help us to differentiate developmental delay from permanent damage and thus extend our knowledge concerning long term prognoses for postinstitutionalized children.

A second focus for future research lies in intervention studies. Research efforts should focus on identifying the kinds of interventions that could be implemented in the orphanage context to ameliorate negative developmental outcomes. There are presently two intervention studies ongoing in Eastern Europe. The Bucharest Early Intervention Project (Koga, Smyke, Zeanah, 2003; Zeanah, Smyke, & Koga, 2003) has begun providing a foster care intervention in Bucharest, Romania, in which they are following the development of children removed from orphanage to foster care and comparing their developmental progress to both children who remain in orphanage and a community comparison group. The St. Petersburg–U.S.A. Orphanage Project (McCall, Muhamedrahimov, Groark, Palmov, & Nikiforova, 2003), operating in three baby homes in St. Petersburg, is providing different interventions to examine which are most effective in reducing the developmental impact of institutional rearing. In one baby home, orphanage staff are being trained in child development and sensitive responsiveness. In a second, both caregiver training and structural changes that reduce the number of different caregivers and increase their stability in the lives of the children are being implemented. A third baby home is serving as a "no intervention" comparison group. Preliminary reports have shown that these interventions have been successful in improving both caregivers' attitudes and behavior toward the children in their care and children's scores on standardized measures of personal–social, communication, and cognitive skills.

These projects hold great promise for specifying the kinds of interventions that may be most effective at ameliorating the developmental delays so common in orphanage children. Given their high cost, however, future research should also examine whether there are less expensive interventions that might be implemented on a wider scale as a partial solution for the hundreds of thousands of children still housed in institutions around the world. For example, future research must focus on examining any possible interventions that put human interaction back in the lives of orphanage children. Improving child to caregiver ratios in orphanages is often a financial impossibility, but such improvement might be realized by either the careful use of volunteers from the community or by providing service learning experiences for students who are interested in child development and education. This could provide a practical solution to the problem of high child to caregiver ratios in institutions, but it would have to be implemented with care to ensure that such volunteers were committed and somewhat stable figures in children's lives. Children in Eastern European orphanages are typically housed in age segregated groups, a policy that hinders cognitive growth. More than 50 years ago Skodak and Skeels (1945, 1949) showed that placing institutionalized infants as "house guests" with older residents in the institution improved infants' cognitive competence, so the idea of age integration is not new but is a change that could be implemented fairly easily and cost effectively. This is one aspect of the intervention being conducted by the St. Petersburg–U.S.A. Orphanage Project. If young children were housed with other children who were slightly above their own developmental level, this would offer them a zone of proximal development that could promote positive developmental outcomes (Vygotsky, 1978).

Piaget's constructivist theory emphasizes that interacting with both objects and people stimulates cognitive development. Both kinds of interaction are sorely lacking in an orphanage environment. Future interventions promoting cognitive development could provide orphanage children with toys and/or computer games that would allow children to make something happen in the environment. This would provide them with a sense of personal effectance and stimulate cognitive growth. Peer interaction in orphanages might be increased through the use of social interactive toys that would require two or more children working together to operate them. If researchers could demonstrate that toys that required such social interaction actually improved developmental

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outcomes then they could be implemented on a wider scale than more expensive interventions.

Research on institutionalized children has shown that similar experiences early in life may result in a variety of outcomes, a phenomenon that Cicchetti (1996) has termed multifinality. We know that orphanage life and the intellectual, physical, social, and emotional deprivation that it entails is clearly a risk factor for less than optimal development. What we have learned from studies of institutionalized children, however, is that having experienced institutionalization does not necessarily doom a child to developmental insult. It also matters what happens after leaving institution. On some measures poorer outcomes are associated not only with early institutional rearing but also with family and parent characteristics in the adoptive home. A stimulating and supportive home environment was associated with higher IQs in orphanage children (Morison et al., 1995), and children's insecure attachment patterns were associated with parents having lower socioeconomic status and more stress (Chisholm, 1998). Institutionalization is clearly a risk factor for compromised development, but it is not possible to predict developmental outcome with any certainty knowing only that a particular child has been institutionalized early in life. When institutionalization is combined with other risk factors (e.g., low IQ, behavior problems, parenting stress, low socioeconomic status), it becomes easier to predict poor developmental outcomes.

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