

Cognitive Development of Children Adopted
from Romanian Orphanages

by

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Cognitive Development of Children Adopted from Romanian Orphanages

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Abstract

The cognitive development of 43 children (23 girls and 20 boys) who had been adopted from Romanian institutions by B.C. families was evaluated. Adoptive parents were asked to describe their children twice, using the Revised Denver Prescreening Developmental Questionnaire. Parents described the children's abilities as they were when parents first met them in Romania, and as the children were at the time of an interview conducted in the adoptive homes at approximately 11 months post-adoption. At the time of first meeting, delays were exhibited in all areas of development (gross motor, fine motor-adaptive, personal-social, language), but at 11 months post-adoption most children less than 2 years of age at adoption were no longer delayed in at least some of the areas, whereas children older than 2 years at adoption generally had not made up their delays. Twenty-three children had been assessed by the Infant Development Programme of B.C., using the Revised Gesell Developmental Schedules; 15 of them had been assessed more than once. Analysis of their Gesell scores showed that progress was equal across areas, and that on average, children progressed more than one month developmentally for each chronological month spent in Canada. Correlations of Gesell DQs with quality of the adoptive home, as indexed by family income, parental education, and socioeconomic status, revealed significant positive relationships for adaptive, personal-social, and language development. Malnutrition in the

orphanage, as indexed by weight of the child for his or her age, was negatively correlated to Gesell DQs in all areas except fine motor development. Favoritism within the institution was positively correlated with Gesell DQs in all areas of development. Implications and future research are discussed.

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In December 1989, after Nicolae Ceausescu was overthrown, news of thousands of Romanian children living in extremely impoverished and underfunded orphanages spread to the West. Concerned and childless parents flocked to Romania in the hopes of adopting, and rescuing, a child. In the present study, the plight of some of these children is used to examine both the detrimental environmental effects of institution-rearing and the positive effects adoption may have on the children's development. Romanian children who spent at least 8 months in one or more of these orphanages, and who were subsequently adopted by families in British Columbia and northern Washington State comprised the sample studied.

Institutionalization has long been known to affect the development of children. Studies on institutions as compared to "normal" environments have shown that they offer fewer opportunities for acquiring or practicing new skills, inadequate motivational conditions involving reinforcement and praise, and little variation or adaptation to individual needs or differences (Yarrow, 1961).

Analyses of separate aspects of developmental functioning in institutionalized children have revealed that not all functions are affected equally, but that different amounts of sensory, social, and emotional deprivation are interrelated in complex ways (Yarrow, 1961). Yarrow (1961) emphasized that the findings on the effects of

institutionalization on children were based on studies of varying degrees of methodological rigor. Most of the data consisted of descriptive clinical findings arrived at fortuitously rather than through planned research, and frequently the findings were based on retrospective analyses which had been narrowly directed toward verification of clinical hunches.

In the present research the Romanian adoptees' institutional experience will be compared to experience described in previous research on institutionalization. If, as Yarrow (1961) pointed out, characteristics of the environment are critical to the evaluation of the effects, it is relevant to describe a general picture of the conditions of the orphanages from which the children in the present study came:

- 1) Most adoptive parents reported that children did not have enough to eat or drink, generally being fed a thickish soup and clear tea, so most children fell well below the normal weight curve for their ages (McMullan & Fisher, 1992).

- 2) Romanian orphanages, as described by adoptive parents and others, were colorless, for the most part sterile and very quiet, with little visual or auditory stimulation available to the children. Half of the adoptive parents reported that toys were available, but all of these had been introduced since the revolution (Ames & Carter, 1992).

3) In infant rooms, child-to-caregiver ratios averaged 10:1; for children one to three years of age, 15:1; and for older children the ratio averaged 20:1 (Ames & Carter, 1992).

High child-to-caregiver ratios allow for minimal personal interactions, and limited opportunities for reinforcement or praise. Caregiving was conducted in an assembly line fashion, leaving a child with little control or opportunity for variety in life (Ames, 1990). Some children were described as dirty or soiled or as having insect bites or sores. Most were characterized as uninterested or unresponsive, spending most of their days lying or sitting immobile in their cribs (McMullan & Fisher, 1992).

Early Literature on the Effects of Institutionalization

Studies Examining the Effects of Institutionalization on Children

Several studies examining the effects of institutionalization on children under conditions similar to Romanian orphanages have been conducted (Dennis, 1973; Goldfarb, 1943, 1945a, 1945b; Provence & Lipton, 1962; Spitz, 1945, 1946). Although institutional conditions varied in these studies, communalities were evident: 1) infants typically spent most of their day lying passively and silently in their cribs, rarely leaving the room; 2) infants received nourishment through bottle feeding with a large nipple while

propped in their cribs; 3) there was minimal interaction between caregiver and child during bathing and diapering, which by necessity had to be efficiently and quickly carried out; and 4) toys or equipment, if available, were rarely used, impeding gross motor and fine motor development.

Effects of institutional rearing on cognitive development. General impairments in intellectual functioning, as evidenced in low Developmental Quotients (DQ), have been reported (Dennis, 1973; Goldfarb, 1945a; Provence & Lipton, 1962; Spitz, 1945). Using the Stanford-Binet-Cattell, Goldfarb (1945a) found that the mean DQ of children aged 34 months who spent the first three years of their lives in an institution ($\bar{M} = 68$) was substantially below the average range (85-115). Spitz (1945) examined children institutionalized in the first year of life and found their DQs on the Hetzer-Wolf baby test to average 75 at 6 1/2 months and 72 at 1 year. These average scores are significantly less than the average scores of children in the contrast groups, who averaged 105 in the nursery sample and 131 in the home-reared sample of children with parents who were professionals. Provence and Lipton (1962) used the Hetzer-Wolf scales and the Gesell Developmental Schedules and found that although the institution-reared children displayed a mean DQ of 101 at 14-26 weeks, the mean DQ dropped to 87 at 27-39 weeks and 85 at 40-52 weeks. The contrast group of home-reared foster children, on the other

hand, maintained an average range DQ of 111 in the early weeks, and only dropped to 106 at 40-52 weeks. Using abbreviated versions of the Cattell-Stanford-Binet scales, Dennis (1973) found that the institution-reared children in his study demonstrated declines in DQs similar to previous studies. In general, then, studies are consistent in having found greater cognitive declines with longer times spent institutionalized.

Additional clinical observations revealed that infants in the first year of life tended to display delays in investigatory behavior, in memory for hidden toys, and in combining toys in play (Provence & Lipton, 1962). The overall impression these authors had of the institution-reared infants, in contrast to home-reared children, was their general lack of explorational zest. The only infants who seemed to be less vulnerable to these delays were the few who were the nurses' favorites (Provence & Lipton, 1962). Provence and Lipton (1962) noted that the additional qualitative difference in stimulation received by such children influenced their development, as evidenced by better progress compared to most children in the wards.

Effects of institutional rearing on language development. Direct language stimulation, something the Romanian children lacked, is required for normal language development (Hunt, 1986). Delays in language development have been reported as a result of institutionalization early

in life (Dennis, 1973; Goldfarb, 1945a; Provence and Lipton, 1962). Dennis (1973) pointed out that skill in spoken language must be derived from persons whose grasp and usage of speech is superior to one's own. Given that caretakers in institutions rarely had the time to converse and because age segregation of the children was the norm in institutions, there was little downward transmission of knowledge or language. In assessing institutionalized children's development, Dennis (1973) even attempted to maximize children's scores by using an abbreviated version of the Stanford-Binet, eliminating items involving vocabulary, verbal comprehension and verbal facility, and still children displayed delayed development.

Provence and Lipton (1962) reported that depression of language development in institutionalized infants was clearly discernible by 2 months of age, with evidence of lower outputs of sound in quantitative terms and a lack of full elaboration of a musical, cooing quality of vocalization normally expected by at least the third month. By 6 months of age, the form of the noises the children made was normal, but there was a lack of robustness, vigor and elaboration of sound expected by this age. After 6 months of age, there was a notable decrease in vocalization, and spontaneous vocalization was rare. In two studies (Hunt, Mohandessi, Ghodssi & Akiyama, 1976; Provence & Lipton, 1962) it was noted that only the few favorite children who received special attention were likely to learn a few words

by the age of three.

Effects of institutional rearing on motor development.

Although Goldfarb (1945a) found that at 34 months of age there was no indication of delay in motor coordination of institutionalized children, as evidenced by skipping, jumping, and hopping, Provence and Lipton (1962) and Dennis (1973) both noted that institution-reared children in the first year of life appeared more inactive generally than home-reared children. Provence and Lipton (1962) reported that most activity took place within the boundaries of the crib. Behavior of hands and arms appeared normal in three- to four-month-old children but lower extremities did not function in a comparably mature way; there was less kicking, and feet were not put down to support weight. After 6 months of age, grasping deviated from the norm, in that children reached less frequently and arm movements were less smoothly coordinated. In addition, there was a decrease in interest in toys. By 8-9 months of age, there was evidence of low impulse or drive to approach, grasp or manipulate toys, and children were slow in getting to a sitting position, in pull-to-standing position, and in walking with support. There was significant impairment in their ability to use motor skills to seek pleasure, to avoid displeasure, to initiate social interchange, to exploit the environment for learning, and to express their feelings. The principal finding was the discrepancy between motor maturation and its

use by the infant in adaptation to the environment (Provence & Lipton, 1962).

Effects of institutional rearing on social development.

Provence and Lipton (1962) reported delays in stranger versus attendant discrimination and in imitation of facial expressions in institutionalized children. After 6 months of age, the children made only minimal attempts to initiate social contact or engage in playful activity. The authors pointed to repercussions of institution-rearing on the growth of a sense of trust and a capacity for initiating action that either provides social contact or wards off danger. Children did not tend to seek adults when distressed or in need of help, probably because such assistance was generally unavailable to them or cries for it were not answered.

To summarize, virtually all areas of development show evidence of delay in institutionalized children. Although the older children in one study (Goldfarb, 1945a) progressed to a normal level of motor coordination by the age of 34 months, the younger children in other studies evidenced delays in both gross and fine motor development, and displayed a general impairment of their ability to seek pleasure, avoid unpleasantness, and initiate contact with others. As a whole, institution rearing fostered impairments in cognitive development, especially play

activity, exploratory behavior, and memory for hidden objects. In all relevant studies, children exhibited below average developmental quotients and impaired language development, probably as a result of the low staff-to-child ratios and minimal interchange between staff or older children and young children. As Romanian orphans were reared in similarly unstimulating and deprived conditions it is hypothesized that they too will exhibit delays in development.

Studies Examining the Development of Children after Leaving the Institution

Few studies have examined the development of young children once they have been released from institutional care. The progress of institutionalized children post-adoption has been investigated by four research studies (Dennis, 1973; Flint, 1978; Goldfarb, 1943, 1945b, 1955; Provence & Lipton, 1962); however, most followed the children only in later childhood and adolescence. None of the studies investigated motor development or social development in young children post-adoption; therefore, only cognitive and language development will be reviewed.

Goldfarb (1943, 1945b, 1955) studied children who had been placed in foster care, using the Wechsler-Bellevue intelligence test when the children were 3 years 7 months, and then in early adolescence. Provence and Lipton (1962) reported clinical observations of children in foster or

adoptive care. Observations were made at various stages of childhood when the children were between the ages of 2 and 5 years. In Dennis's (1973) study children were adopted by families living in the United States and Lebanon. Using the Cattell or the Stanford-Binet (Form L-M), Dennis tested the children whenever he could find them, which meant that some were seen as young as 16 months while others were only tested in their late teens. Flint (1978) followed children in adoptive homes after they had undergone a rehabilitation programme in their orphanage. The children averaged 2 1/2 years at the start of the rehabilitation programme, and adoptive families were selected once "each child demonstrated sufficient evidence of normal behaviour to be acceptable in a home" (p.26). This study also employed a specific intervention programme for the children once they were adopted, which may have affected their development. The children were tested using a standardized measure of cognitive development, as well as the Rorschach projective test, at 6 years, 9 years, 12 years, and 15 years of age.

Cognitive development of post-institutionalized children. Goldfarb (1943) and Flint (1978) both noted that concreteness of thought, distractibility, and impairments in intellectual flexibility were evident in children years after their transfer from the institution. Although Provence and Lipton (1962) reported gains in areas of development learned through imitation and repetition, the

children had difficulties in abstract thinking and generalizing from one situation to another.

Flint (1978) found that children in her study had average IQs at all testings post-adoption. However, evaluation of concept formation using the Rorschach revealed deficiencies in the children's ability to assimilate information and to comprehend the underlying functional relationship between ideas. Flint also reported that verbal intelligence displayed greater impairment than visuo-spatial abilities.

In terms of IQ measures, Goldfarb (1945b) found that children placed in foster care after living the first three years of their lives in an institutional setting did not make substantial gains in IQ seven months after placement. Moreover, institution-reared children's IQ scores remained at the same level in subsequent testings at 6 years 11 months and at 12 years of age.

Dennis (1973), on the other hand, found that children adopted to American or Lebanese families made considerable gains in IQ scores within two years of placement. If children had been adopted before the age of 2 years, average IQs ($\bar{M} = 96$, $n = 28$) were obtained in the first 2 years post-adoption (Dennis, 1973). Children who were adopted after two years of age also greatly improved in intelligence; however, based on his calculations, Dennis (1973) contended that retardation evidenced at the time of adoption left a permanent impairment. Although these older

adoptees progressed at a normal rate of development once exposed to a stimulating home environment (one year developmentally for each chronologically), the degree to which they lagged behind the norm was positively related to the length of time they had spent in the institution. It must be emphasized, however, that although the majority of adoptees were followed into their teens, assessment of one-third of the adoptees was conducted when the children were under 10 years of age, rendering the claim of permanent retardation a little premature.

Flint (1978) also found a relationship between length of institutionalization and subsequent cognitive development. Although the children in her intervention study maintained near-average IQs from 6 years to 15 years (93 and 104, respectively), their IQs at 6 years were negatively correlated to the duration of their stay in the orphanage before any rehabilitation programme was begun.

In sharp contrast to these studies, Tizard and associates (Tizard & Rees, 1974; Tizard & Hodges, 1978; Hodges & Tizard, 1989) found no evidence of cognitive retardation, verbal or otherwise, in children who had been institutionalized but were subsequently adopted. These researchers followed the children from the time they left the institution at a mean age of 23 months until they turned 16 years old. It should be noted, however, that the residential care these children experienced was far superior to that provided in the previous mentioned institutions.

The Tizard studies suggest the positive impact on cognitive development that good staff-to-child ratios, outings, and provision of books and toys can have on children.

Language development in post-institutionalized children. Not only did language development suffer the most in institutional settings compared to other areas of development, but it took longer for recovery as well, often remaining delayed into adolescence (Flint, 1978; Goldfarb, 1945b). Provence and Lipton (1962) reported that although there was no permanent disturbance in articulation of particular sounds (some children, however, clung to infantile pronunciation), institution-reared children exhibited a prolongation of mimicking and a delay in spontaneous verbalizations, including those of feelings and expression of ideas.

Critique of studies on children adopted from institutions. In comparisons of the aforementioned studies, there is a confound associated with adoption versus foster home placement. For instance, differences in the extent of intellectual impairment between children in Goldfarb's (1943, 1945a, 1945b) and Dennis's (1973) studies could be attributed to the fact that children in the former study were put into foster care, sometimes undergoing multiple family placements, whereas the children in the latter study went to permanent adoptive homes. Given that all the

Romanian children in the present study were adopted, comparison with the results of the foster-placement study should be made with caution.

Other methodological problems exist in some of these studies. Provence and Lipton's (1962) astute comments about the children's progress post-adoption were based solely on observations; no systematic data collection was employed. In Flint's (1978) examination of Canadian children, the effects of the rehabilitation programme in the institution and the subsequent intervention exercised with the adoptive families cannot be separated or directly examined, and thus may confound the results.

Dennis's study (1973) offers the most detailed and concrete evidence concerning the cognitive development of orphans post-adoption. However, multiple problems exist within the data and with the analysis of the data. First, there was a 16-year span from the birth of the youngest to the oldest of the children in his sample. Although the author reported the existence of changes in the orphanage due to government subsidy and control of admissions in the latter years, no mention was made of potential change due to the longtime presence of researchers in the orphanage. Secondly, there were wide discrepancies in the ages of the children when cognitive testing occurred, testing times ranging from several months post-adoption to 16 years post-adoption. Thirdly, some of the children Dennis included in his sample of adoptees under the age of 2 years had spent a

minimal amount of time in the institution (less than one month), and therefore any effects of institutional rearing may be nonexistent. Lastly, the calculation of the rate of mental development of the children adopted after 2 years is of concern. One of the main findings of Dennis's research was that those older children, although demonstrating progress, retained a permanent impairment related to their institutional stay. The calculations were based on the assumption that these children exhibited a mental age of half their chronological age at time of adoption. However, this was only an approximation, used by Dennis due to the unavailability of actual test results at the time of adoption.

In summary, because of questionable methodology, multiple placements of children in foster homes, and confounding factors such as intervention, the institution studies of the 1940s-1970s do not provide us with clear answers to three questions: (1) What are the effects of institutional rearing on children in the early years post-adoption; (2) What effect does length of institutional stay have on subsequent development; and (3) How much progress can these children make once adopted into stimulating environments? These will be examined in the present study.

Effects of Environmental Influences on Development

More recent studies have addressed environmental influences on the development of young children (Brossard & Decarie, 1971; Hunt et al., 1976; Sigman, McDonald, Neumann & Bwibo, 1991). The factors examined in these studies included lack of proper nutrition, lack of physical stimulation, and lack of social stimulation, all of which were associated with the deprived institutional conditions in Romanian orphanages.

Effects of Nutrition on Cognitive Development

Undernutrition, mild or severe, can produce behavioral changes in a child at any age. Protein-energy malnutrition decreases playfulness, exploratory activities, motivation, and arousal, and increases apathy (Frank & Ziesel, 1988). Iron deficiency correlates with lower scores on developmental tests, and with decreased social responsiveness (Frank & Ziesel, 1988).

Nutrition also has an impact on cognitive development. Sigman et al. (1991) conducted a longitudinal study examining the effects of early food intake on later cognitive competence. They found that the total level of calories available to a toddler between 18 and 24 months was positively associated with later cognitive skills on language and nonverbal measures. Both animal protein and fat

intake, independently from other environmental factors such as parental cognitive ability and socioeconomic status, predicted later skills.

Most studies on the effects of malnutrition employ an intervention paradigm with undernourished samples, that includes nutritional supplementation and cognitive and psychomotor stimulation, thereby confounding purely nutritional effects on cognitive development (Skuse, 1988).

The effects of malnutrition on the development of Romanian institutionalized children are of concern because most adoptive parents reported malnutrition amongst the children (McMullan & Fisher, 1992). As the biological condition is only one ingredient in the developmental formula that affects intellectual/social/emotional competence (Sameroff, 1986), an examination of both the physical and social environment on the developing child will also be conducted in the present study.

Effects of Physical Environment on Cognitive Development

According to the specificity model of early environmental action, different aspects of the physical environment relate to different aspects of the cognitive development of a young child (Wachs & Gruen, 1982). In addition, different environmental factors influence children of different ages (Wachs & Gruen, 1982). Therefore, differential predictor-criterion relationships would be expected as a function of age.

A number of factors documented in the specificity model are relevant to the development of children growing up in deprived environments such as the Romanian orphanages. Availability of stimulation materials or toys, variety of stimulation concurrently and over time, responsivity of stimuli, and physical restrictiveness have all been shown to influence cognitive development (Wachs & Gruen, 1982).

Existing evidence suggests that the availability of stimulation materials is positively related to cognitive development prior to nine months of age (Wachs & Gruen, 1982). Brossard and Decarie (1971) found that provision of decorative mobiles and distinctive sounds to 2 1/2-month-old institutionalized infants attenuated the decline of measured intelligence normally found in institutionalized babies. Hunt et al. (1976) reported that institutionalized infants who received audio-visual stimulation in the form of tape-recorded music and mother-talk, and coloured discs and mobiles, achieved criterion behaviors on the Uzgiris-Hunt scales of development earlier than infants not receiving the enrichment. Availability of stimulus material demonstrates no relationship to IQ in infants over nine months of age, however, even though the infants may play with the objects (Wachs & Gruen, 1982).

Exposure to a wide variety of toys or objects is also positively related to cognitive development (Wachs & Gruen, 1982). One study using the Home Observation for Measurement of the Environment (HOME) revealed positive correlations

between the subscale of "variety of stimulation" at 6, 12, and 24 months and intelligence scores at 3 years and 4 1/2 years (Bradley, Caldwell, Rock, & Harris, 1986). As children get older, however, changes over time in object variety become more important than the number of different objects available at one time (Wachs & Gruen, 1982). Hunt et al. (1976) found significant improvements in the development of institutionalized children who were exposed to audio-visual stimulation that changed as the child developed. For example, infants were first exposed to a coloured disc, but then as the infant lost interest in the disc over time, it was replaced with striped mittens, and then later with a mobile consisting of three circular discs.

Another factor affecting the cognitive development of young children is responsivity of the physical environment (Wachs & Gruen, 1982). Responsivity involves changes in the sensory properties of stimuli as a result of a child's interaction with them. The evidence clearly suggests the importance of nonsocial inanimate responsivity for cognitive development at least during the first 2 1/2 years of life (Wachs & Gruen, 1982). Examples of responsivity include toys that change shape and colour as they are manipulated, and mobiles with strings attached to them which, when pulled, start nursery tunes. Provence and Lipton (1962) proposed that the importance of responsivity in inanimate objects may lie in the fact that infants deprived of a responsive environment learn to stop responding to the

environment.

Finally, available evidence suggests that physical restriction of a child's attempts at exploration are related to lowered cognitive development (Wachs & Gruen, 1982). Restrictions are often defined in terms of lack of freedom to move around or in terms of physical barriers, restrictions evident in the Romanian institutional setting.

According to the specificity model of environmental action, in order to enhance cognitive development young children need to be exposed to a wide variety of toys, to toys that change over time as the child develops, and to toys that change as the child interacts with them. Children also need freedom to explore surrounding environments. Romanian institutions offered none of these physical stimuli, and most children were confined to their cribs for most of the day (Ames, 1990).

Effects of the Social Environment on Cognitive Development

The effects of "maternal deprivation" on a growing child have been extensively investigated and connected to declines in developmental growth (Spitz, 1945; Bowlby, 1953; Yarrow, 1961). Bowlby (1953) argued that institutions fail to offer children the warm, intimate, and continuous relationship with a mother or mother-substitute, a necessary condition for healthy development, according to Bowlby. The idea that the delays found in institutionalized children are predominantly due to lack of mother-love has, however, been

criticized since the early 1960s (Brossard & Decarie, 1971; Casler, 1961; Rutter, 1979). In a review of studies implicating the lack of a mother as the source of intellectual deficits in children, Casler (1961) and Rutter (1979) both argued that these deficits cannot be rightly attributed to maternal deprivation itself, but rather to other factors related to lack of mothering (e.g., tactile, auditory, and kinesthetic stimulation). Rutter (1979) suggested that perceptual and linguistic experiences played main environmental roles in the development of intelligence, and that personal mothering, although important in other aspects, was largely irrelevant for cognitive growth. Indeed, Tizard and her colleagues (Tizard & Rees, 1974; Tizard & Hodges, 1978; Hodges & Tizard, 1989) found no deleterious effects on the cognitive development of children raised in residential care with exposure to a large number of caregivers to whom they were not able to form particular attachments.

Although attachment to a primary caregiver does not seem to be directly related to intellectual development (Matas, Arend & Sroufe, 1978; Tizard & Hodges, 1978), a secure attachment is founded on a child's ability to use a caregiver as a secure base from which to explore the environment (Ainsworth, Blehar, Waters, & Wall, 1978). Matas et al. (1978) pointed out that a competent 12- to 18-month old is one who has formed an attachment relationship which effectively supports active exploration and mastery of

the inanimate and social environment. These researchers found that securely attached two year-olds displayed more enthusiasm, more positive affect, and greater persistence in problem-solving, and exhibited less nontask behavior, ignoring of mother, and noncompliance than insecurely attached toddlers. Competence in problem-solving may thus be related to having a secure and reliable base from which to explore.

Another aspect of the social environment that may have a profound effect on a child's development is language stimulation. One-on-one language stimulation is required for a growing child to learn how to speak (Hunt, 1986). In institutions in which child-to-caregiver ratios are very high, there is little time for interaction, let alone focused stimulation. Hunt et al. (1976) found that improving child-to-caregiver ratios, furnishing infant contingency-operated tape recordings and mobiles, and training caregivers to provide infants with spatial manipulative toys all resulted in important perceptual-motor cognitive gains. It was not until caregivers were trained to focus specifically on language, however, that institutionalized children made large gains in language development (Hunt et al., 1976; Hunt, 1986).

In summary, although attachment relationships to caregivers may not directly influence cognitive development, they may enhance competence in problem solving and encourage exploration of the environment. In addition, children

require individually-administered language stimulation in order to develop their skills in communication. Due to high child-to-caregiver ratios (Ames & Carter, 1992), children reared in orphanages such as those in Romania experience a social environment that is insufficient for normal cognitive development.

Beneficial Factors Related to Improvement in Early Childhood

Although not without weaknesses, research on the effects of institutionalization suggests that at least some of the delays exhibited in institutionalized children's development need not be permanent, but may be altered by external variables such as length of institutional stay and stability of placement. Although explanations for the developmental delays exist, to date no study has systematically addressed potential predictors of post-adoption progress. While Flint (1978) stressed the importance of a secure and dependent primary relationship to encourage learning in children, Provence and Lipton (1962) hypothesized that maternal care, family life, and enriched environments were what the children needed. No empirical data were available, however, to support their hypotheses.

Environmental factors which improve a child's situation play an integral role in cognitive development (Clarke & Clarke, 1976; Bouchard & Segal, 1985). Proper nutrition, a high degree of parental awareness of a child's developmental

needs, and stimulating environments have been suggested as examples of beneficial factors which can influence development (Greenbaum & Auerbach, 1992). Although Greenbaum and Auerbach (1992) defined these environmental influences as "protective factors", this may assume the child has always had these influences in his or her life. The word "beneficial" will be used in the present study as the children have only been exposed to these influences since adoption.

Several studies have documented the effects of nutritional rehabilitation and treatment programmes on previously deprived children (Lien, Meyer, & Winick, 1977; McKay, Sinisterra, McKay, Gomez & Lloreda, 1978; Winick, Katchadurian, & Harris, 1975). An adoption study of Korean girls (Winick et al., 1975), who underwent severe nutritional deprivation during the first two to three years of life, and were adopted into American middle-class homes before age 3, showed remarkable gains in height and weight six years later. In addition, their scores on IQ and achievement tests were above North American norms (Winick et al., 1975). A large nutritional and educational supplementation study of deprived children from Columbian families also revealed impressive gains in cognitive performance (McKay et al., 1978). These studies strongly suggest that the prospects for rehabilitation of severely malnourished infants and children are good.

Other beneficial factors have also been identified as

playing a role in an adopted child's developmental outcome. Although selective placement into adoptive homes has not been ruled out completely, family social context, parental education, and income have been shown to influence cognitive and social development. Clarke and Hanisee (1982) studied adopted Asian children who had suffered disruptive early childhood experiences. Two-thirds of the children were reported to have been malnourished at some time in infancy and all had lived in orphanages, foster homes, and/or hospitals. After having been in their adoptive homes for an average of 23 months, their verbal scores on the Peabody Picture Vocabulary Test averaged 120 and their Vineland Social Maturity scale scores averaged 137, both significantly above standardization samples. The researchers contended that the high scores were related to the adoptive environment, which included highly educated, high income, and high occupational status parents.

Maternal education (Yeates, MacPhee, Campbell, & Ramey, 1983; Shonkoff, Hauser-Cram, Krauss, & Upshur, 1992) and maternal IQ (Luster & Dubow, 1992) have also been shown to correlate positively with measures of the home environment. Perhaps highly educated mothers are more knowledgeable about child development and stimuli appropriate for aiding the progress of a deprived child's cognitive development than are less educated mothers.

The presence of older siblings, who are able to encourage and teach a younger child, may play a part in a

young adoptee's development. Woollett (1986) argued that environments provided by mothers and older children are highly stimulating, complex, and varied, and provide a model for a range of linguistic skills and functions which children develop in the third year. The very fact that young children take over toys recently abandoned by their older brothers and sisters and imitate their behavior, suggests that older siblings play an important role in facilitating the younger child's mastery over the inanimate environment (Lamb, 1978a, 1978b). As well, Lamb (1978a) found that siblings facilitated toy encounters and associated experiences in a way that parents seldom did. These results suggest that having siblings with whom to play and from whom to learn new games and words may be a positive influence in a young adoptee's overall improvement.

In summary, although studies have not empirically examined correlates of progress in institutionalized children once they are put in a more stimulating environment, it seems reasonable to predict that factors such as improved nutrition, family income, parental education, and presence of siblings may positively influence progress in cognitive development.

Purpose of the Present Study

The main purpose of the present study is to examine both the cognitive development and the environmental

influences on the development of Romanian orphans. Based on the evidence from studies of the effects of unstimulating and understaffed institutional rearing on cognitive development, and more recent research on the influence of physical and social stimulation on development, it is hypothesized that parents will report that institutionalized children exhibited delays in all areas of development at the time their prospective parents met them.

Based on Dennis's (1973) claim that children adopted from institutions after two years of age displayed permanent impairment, the development of children adopted before and after two years of age will be compared. It is hypothesized that after some time with their adoptive families, children who were adopted after the age of two years will display more developmental delays and less progress than will children who were adopted before two years of age.

Based on research pointing to the damaging effects of malnutrition on cognitive development, malnutrition in institutionalized children will also be examined in the present study. It is hypothesized that children who were more malnourished in the institution will display more delays in their development than children who were less malnourished.

Based on past research pointing to beneficial factors influencing the development of young children, it is hypothesized that variables such as family income, level of parental education, and presence of older siblings will be

positively related to the progress made by adoptees post-institutionalization.

Although no hypothesis is made at this point, the effects of favoritism in the institution will be examined in the present study, given that there has been some mention in past research on institutionalization of the potential beneficial influence of favoritism on development.

Method

The present study is part of the Romanian Adoption Project, in which parents of Romanian adoptees participated in a lengthy interview and were given three questionnaires to complete.

Selection of Subjects

The group under study was obtained by collecting names of 111 families in British Columbia and 4 families in northern Washington State who had adopted a total of 125 children from Romania. The first adoptive families, personally known to the investigators, were sent a letter inviting them to participate in the research project. From names provided by the original group, other adoptive parents were contacted by letter. Additional families were initially contacted by letters distributed by British Columbia Infant Development Programme consultants. Finally, in some cases parents heard about the research project and contacted us, asking to participate.

All families were contacted via a standard telephone protocol to determine their suitability as participants and to verify the extent of their willingness to participate. Of the 115 families contacted, 39 were suitable for the study and all expressed their willingness to take part. Parents who agreed to participate in an interview and who had one or more children who had spent at least the last eight months in a Romanian orphanage before being adopted,

were considered suitable. Families that were not included in the sample had either adopted children who had spent less than eight months in a Romanian orphanage, or had adopted children who had spent more time in a private home than in an institution, or the parents were unsure as to the child's rearing history.

The Research Sample

The present study focuses on cognitive development; therefore, only those children whose parents completed and returned the Revised Denver Prescreening Developmental Questionnaire (R-DPDQ) are included. (One family did not return the R-DPDQ and was excluded). Of the 38 families left, 31 had adopted one Romanian child and seven had adopted two children. In five of the seven two-child families, both children fit the criterion for study (that is, at least eight months in Romanian institutions); in the other two families only one Romanian adoptee fit the criterion. The sample thus consists of 38 families containing 43 children, 23 girls and 20 boys, each of whom had spent at least the last eight months in Romanian institutions before adoption and for whom the R-DPDQ had been filled out and returned by a parent.

The children had been reared in an institutional setting for a median of 17.5 months (ranging from 8 to 53 months) before being adopted at a median age of 18.5 months (ranging from 9 to 68 months). Because the correlation

between time in the institution and age of the child at adoption was .97 ($p < .0001$), only the variable time in the institution will be used in the analyses.

Demographic characteristics of the 38 adoptive families are displayed in Table 1. Adoptive parents were, on average, in their thirties, for the most part had at least a high school education, and the median family income was \$55,000 a year. Family socioeconomic status (SES) was established using paternal Blishen scores (Blishen, Carroll, & Moore, 1987), which are primarily based on education and income, and to a minor extent on occupational prestige. This index was constructed from 1981 census data for the total Canadian labour force. Occupations were divided into 514 groups with scores ranging from 28 to 78. The mean score for the present sample is 46.9 with a standard deviation of 13.7. Positions held by people whose Blishen score is near 46 include: firefighter, sales manager, health inspector, and real estate salesperson. Twenty-three of the Romanian children were adopted into childless families, while 20 children were adopted into families that already had at least one child.

Table 1

Demographic Characteristics of Adoptive Families

	<u>M</u>	<u>SD</u>
Mother's age (years)	35.8	6.4
Father's age (years)	37.6	6.9
Mother's level of education (years)	14.0	2.5
Father's level of education (years)	14.5	3.9
Family income (median, range)	\$55,000	\$25,000 - \$100,000

N = 38 families

Procedure

Parental Interview

A few days prior to the desired date of interview, the interviewer contacted the family to make mutually suitable arrangements. All interviews were conducted in the homes of the Romanian adoptees, except for two in which adoptive parents from outside the lower mainland area were interviewed in friends' homes while visiting. At the time of the interview, the Romanian adoptees had a median age of 31 months (ranging from 17 to 76 months), and the elapsed time between adoption and the interview ranged from 4 to 25 months, with a median of 11 months.

As part of the interview, parents were asked questions from the Revised Denver Prescreening Developmental Questionnaire to describe their child when they first met him or her in the institution. Questions were also asked about the child's family and institutional background, health and developmental history, social and behavioral characteristics, and progress to date. Other questions related more directly to characteristics of the adoptive family, their experience in Romania, and the events and circumstances following their return to Canada. As well, parents were asked to complete and sign a consent form allowing us access to developmental assessments done on their adoptive child. All parents of children who had received developmental assessments agreed to sign the consent form.

Tape-recorded interviews were conducted by eight different interviewers, one of whom was the present author. Information from the tapes was coded by two independent coders, who then went over the items on which they had not agreed, and either came to consensus with the help of the tape-recording or, as was occasionally necessary, accepted the decision of the chief coder. Four sets of two coders worked on the tapes.

Revised Denver Prescreening Developmental Questionnaire

(R-DPDQ)

The R-DPDQ (Frankenburg, 1986) was designed as a first step screening device in a two-step process to evaluate developmental progress in children aged 3 weeks to 6 years, and was modelled after the Denver Developmental Screening Test (DDST) (Frankenburg, Dodds, & Fandal, 1970).

The R-DPDQ is made up of 105 tasks or items within the range of accomplishments of children in the age span from 3 weeks to 6 years. Items are arranged in chronological order according to the ages at which 90% of children in the DDST standardization sample could perform them (Frankenburg, Fandal, & Thornton, 1987). They are arranged on the test form in four domains:

- 1) **Personal-Social:** tasks which indicate the child's ability to get along with people and to take care of himself/herself, e.g., "Smiles spontaneously", "Puts on clothing", or "Plays interactive games".

2) **Fine Motor-Adaptive**: the child's ability to see and to use his or her hands to pick up objects and to draw, e.g., "Reaches for object", "Passes cube hand to hand", or "Thumb-finger grasp".

3) **Language**: the child's ability to hear, carry out commands, and to speak, e.g., "Imitates speech sounds", "Names one picture", or "Follows directions".

4) **Gross Motor**: the child's ability to sit, walk, and jump, e.g., "Sits, head steady", "Pulls self to standing", or "Walks up steps".

Standardization sample of the R-DPDQ. The standardization sample that the authors (Frankenburg et al., 1987) of the R-DPDQ used consisted of: 1) 1012 children in 6 private pediatric offices, primarily from middle to high socioeconomic backgrounds; 2) 109 children from the University hospital, from middle and low socioeconomic backgrounds; and 3) 313 children from a Head Start center and 8 other day care centers, primarily from low socioeconomic backgrounds.

Reliability and validity of the R-DPDQ. The authors of the R-DPDQ reported that test-retest reliability over a 1 week period was 94%. Inter-observer reliability was 83%. In terms of concurrent validity with the DDST, the authors reported that the R-DPDQ identified 84% of non-average DDST results, when non-average was considered 2 or more delays.

When the criteria were reduced to 1 or more delays, 96% of non-average DDST results were identified using the R-DPDQ.

Use of the R-DPDQ in the Present Study

R-DPDQ when child was first met. Parents were asked to picture their child when they first met him or her. They were then asked a series of questions from the R-DPDQ, in chronological order by domain, beginning from the earliest item on each scale. Parents were asked to say "Yes" (My child could perform the task) or "No" (He or she could not) in response to items that they were certain their child could or could not do within the first few days of meeting. Parents were told that if they did not know or were not sure whether their child could do an item, they should say "Don't Know". Parents were also told that they probably would respond "Don't Know" quite often, but that that should not concern them. The interviewer stopped asking questions in each domain after 3 "No" responses. A child was considered "Delayed" in any domain if a "NO" had been given to an item that 90% of the standardization sample could attain at or below the child's age. If a child passed all the items within his or her age range on a particular domain, the child was considered "not delayed".

Although this information is retrospective in nature, the paucity of "Don't Know" responses was surprising. These were parents who intended to take the children home with them, and they observed very closely what their child was or

was not capable of doing. For 75% of the questions asked, 12% or fewer of parents gave a "Don't Know" response; for the remaining 25% of questions asked, between 14% and 38% of parents responded that they didn't know whether or not their child was able to do the item.

R-DPDQ after time in Canada. Following the interview, parents were provided with three questionnaires to be completed at home. While the questionnaires were directed to the parent who spent most time with the child, it was left to the parents to decide which of them would respond to the questions. One of the questionnaires was again the Revised Denver Prescreening Developmental Questionnaire. However, this time the parents were asked to complete the R-DPDQ based on what the child could do at the time the questionnaire was filled out.

All questionnaires were completed and returned to the interviewer one to three weeks after the interview took place, with the exception of two sets, one of which was returned after six months and the other after eight months. The questionnaires were scored in the same fashion as above.

Gesell Developmental Assessments

A subsample of children have been followed by the British Columbia Infant Development Programme (IDP). With parental permission, developmental reports on all ($n = 23$) of these children have been obtained. The main assessment

used by IDP consultants was the Revised Gesell Developmental Schedules (Knobloch, Stevens, & Malone, 1980). More than one assessment was done on 15 of these 23 children.

The Revised Gesell Developmental assessments were carried out in the adoptive family home by an Infant Development consultant in the presence of the mother/parent. The parents received written reports of these assessments, and with the permission of the parent, the Romanian Adoption Project received copies of these reports.

Revised Gesell Developmental Schedules

This test is a measure of central nervous system function, not IQ, according to the original authors (Gesell & Amatruda, 1967) and the authors of the revised edition (Knobloch et al, 1980). It is designed to predict delayed development as a result of brain damage or sensory impairment, and is the main assessment tool used by the B.C. Infant Development Programme, which evaluates and serves clinical populations of children from birth to 3 years of age.

The revised version of the Gesell is divided into five areas of behavior:

1) **Adaptive behavior:** concerned with the organization of stimuli, the perception of relationships, the dissection of wholes into component parts, and the reintegration of these parts in a meaningful way. Adaptive behavior represents the anlage of later intelligent behavior, which

utilizes previous experience in the solution of problems (Knobloch & Pasamanick, 1963), and is considered the most important area (Gesell & Amatruda, 1967). Tasks included in this area involve the following: spatial awareness, as seen in tower building with cubes; form perception, as seen in the child's ability to insert shapes into a formboard and adapt to its rotation; and problem solving skills, such as obtaining a toy using a stick or accessing a pellet inside a bottle.

2) **Gross motor behavior:** includes postural reactions, head balance, sitting, standing, creeping, and walking.

3) **Fine motor behavior:** consists of the use of hands and fingers in the prehensory approach to grasping, and manipulation of objects.

4) **Language behavior:** includes all visible and audible forms of communication, whether facial expression, gesture, postural movements, vocalizations, words, phrases, and sentences. Language behavior also includes mimicry and comprehension of the communication of others.

5) **Personal-social behavior:** comprises the child's personal reactions to the social culture in which he or she lives. This area includes feeding abilities, self-dependence in play, cooperation, bladder and bowel control.

Standardization of the Revised Gesell. The standardization sample for the revised edition of the Gesell was comprised of 927 volunteer healthy black and white

infants from New York State. An attempt was made to match characteristics of maternal and parental education to the area statistics (Knobloch et al, 1980). Most items were taken from the original Gesell, as well as some from the Bayley Mental Scales and the Uzgiris-Hunt Scales. Items were placed at the age at which 50% of the children were successful.

Reliability and validity of the Revised Gesell.

Interobserver reliability of the revised edition of the Gesell was calculated using the overall percentage of agreement for 305 test items (Knobloch et al, 1980). For 2302 comparisons, agreement was 94%, varying from 88% in fine motor behavior to 97% in language behavior. Interrater reliability correlations ranged from .84 to .99.

Predictive validity for the Revised Gesell has not been established. Predictive validity using the original version, however, produced some of the highest correlations of an infant test with the Stanford-Binet that are found in the literature (McCall, Hogarty & Hurlburt, 1972). Knobloch and Pasamanick (1963) reported a correlation of .50 between 40-week-old Gesell DQs and 3-year Stanford-Binet IQs, and McCall et al. (1972) reported correlations of .58 to .74 between 24-month Gesell DQs and 3 1/2-year Stanford-Binet IQs. As well, Roe and colleagues (Roe, 1977; Roe, McClure & Roe, 1983) found that the Gesell demonstrated a strong positive relationship with later nonverbal tasks. Roe

(1977) reported correlations of .51 to .61 between 9- and 15-month Gesells and 27-month DQs on non-verbal tasks of the Merrill-Palmer Scale of Mental Tests.

Scoring and Use of the Revised Gesell in the Present Study

Written assessment reports received from the IDP give a brief background history of the child, followed by a detailed description of the child's functioning in the five areas of development evaluated in the Revised Gesell. The child's chronological age and his or her level of functioning in each of the areas are given, along with the tasks or items performed successfully. The emphasis of these assessments and reports is positive, i.e., what the child is able to do (V. Gonzales, personal communication July 7, 1992).

After consultation with Valerie Gonzales, IDP assessment coordinator, it was decided that the written reports contained sufficient detailed information that they could be transcribed back onto the scoring sheets used in the assessments, in order to evaluate particular areas of delay or progress.

Scoring from the IDP reports proceeded as follows: 1) a "+" sign was given when a child demonstrated a particular pattern and 2) a "-" sign was given when the child failed to display a pattern. This is the same scoring procedure used by the authors (Knobloch, et al., 1980). An estimate of the developmental maturity of the child in each area is based on

the distribution of + and - signs. The plusses and minuses are not summed and averaged, because it is the clinical picture that is significant (Knobloch et al., 1980).

Developmental maturity was appraised by determining how well a child's behavior fit one age level constellation rather than another. If a given child, for example, passed most items at the 18 month level, but failed one or two items at the 15 month level, the child would be assigned a mental age of 17 months, indicating that he or she had almost attained 18-month status. If another child passed most of the items at the 13 month level, passed most but not all at the 15 month level, and passed a few items at the 18 month level, this child would be assigned a mental age of 15 months. In this manner, a mental age was assigned to each child in each of the five domains (at each testing, when appropriate). All assigned mental ages fell within the range that had been given by the IDP assessment worker on the developmental reports. Inter-rater reliability on 25% of the developmental reports was evaluated by having the IDP reports coded by 2 independent coders. The correlation coefficients between the 2 coders' estimates for each area of behavior ranged from .98 to .99.

A Developmental Quotient (DQ) was calculated for each child in each domain (at each testing) by dividing the assigned mental age by the child's age at testing.

Construction of the Quality of the Home Variable

Examination of the intercorrelations among the adoptive family characteristics, namely level of parental education, income, and SES (Table 2), shows that all variables are significantly related to each other. A calculation of internal consistency revealed a standardized alpha of .83, with each variable being highly correlated with the total (maternal education: $r = .80$, paternal education: $r = .62$, income: $r = .48$, and SES: $r = .73$). It was decided that a measure of home quality could be computed by summing the variables; however, because of scaling differences, the variables were first standardized ($M = 0$, $SD = 1$). The new variable, quality of the home, had a mean of $-.13$ and a standard deviation of 2.93 , and subjects' scores ranged from -5.51 to 7.12 , with higher values indicating higher quality homes. This variable will be used in all analyses that relate family characteristics to the child's development.

Table 2

Intercorrelations among Adoptive Family Characteristics

	Father's Education	Income	SES
Mother's Education	.63**	.48*	.76**
Father's Education		.35*	.59**
Income			.46*

n = 40

* $p < .05$ ** $p < .002$

Results

Given that the plan of the Romanian Adoption Project is to follow the children longitudinally and to relate the findings from the present study to factors to be measured later, type I errors (the probability of overestimating relationships within the data) were deemed less important than overlooking possible findings. For these reasons, all results will be considered significant and worthy of note if they fall at or below $p = .10$.

Index of malnutrition

Weight percentile for age, based on standards from the U.S. National Center for Health Statistics (Hamill et al, 1979), was used as an index of malnutrition in the children. Table 3 displays the percentage of children falling in particular weight brackets, both when the parents first met them in the institutions, and again at the time of the interview, an average of 11 months post-adoption. In the institutions the majority of the children fell below the 5th percentile for their age. At the time of the interview most children had improved in their status; 63% of them fell above the 10th percentile. Change in weight status was measured by the number of category steps in Table 3 a child had changed from the first to the second weight measurement, e.g., a child was < 5th percentile when first met and who was between 11th and 25th percentile at time of interview, received a change score of +2. There was no relationship

Table 3

Weight Percentiles of Children When First Met and at Time of Interview

Percentile ranking for weight by age	% of children	
	In institution when parents first met child (n = 37)	At time of interview (n = 35)
< 5 %	59	20
5-10%	24	17
11-25%	5	11
26-50%	3	20
51+ %	9	32
median	< 5	26-50
range	< 5 to 95	< 5 to 95+

between improvement in weight status and the length of time spent in Canada ($\underline{r} = -.05$, $\underline{p} = .78$).

Favoritism in the orphanages

Although the literature on institutionalization indicated that most children receive little individual attention from caregivers in the institutions, favoritism in the Romanian orphanages may have played a significant role in the lives of some of the children in the present study. As most prospective adoptive parents spent some time in the orphanages from which their child was adopted, they had the opportunity to witness whether or not their child had been a favorite of the caregivers. When asked during the interview "Did you notice if the caregivers had favorite children?" and "Was (your child) a favorite?", 47% of parents reported that their child had been a "favorite", while other parents either indicated that their child had not been a favorite (37%) or that the caregivers did not seem to have favorites (16%). Favoritism was not related to the amount of time the child had spent in the institution, or to how attractive the child was rated to be by the interviewer from pictures taken in the orphanage or shortly thereafter. Favoritism was, however, significantly related to ratings of dirtiness, in that parents of "non-favorite" children were more likely to report that their child was dirty or soiled upon first meeting him or her (39%) than were parents of "favorites" (6%), $X^2 (1, N = 35) = 3.69$, $\underline{p} = .05$. Favoritism was also

related to the weight of the child for his or her age, in that "favorites" ($\text{Mdn} < 5\text{th percentile}$) were slightly, but significantly, heavier than "non-favorites" ($\text{Mdn} < 5\text{th percentile}$) at the time of first meeting parents (Mann-Whitney $U = 96.0$, $p < .10$).

Developmental delays at first meeting

Parental report on the R-DPDQ was used as an indicator of how developmentally delayed the children were when adoptive parents first met them. The left column of Table 4 displays the percentage of children delayed in the four areas of development. There were no significant differences among the areas as to the number of children who were delayed (Cochran $Q(3) = 5.5$, $p = .14$). As well, 79% of children displayed delays in all four areas, 14% of children had delays in three areas, and the remaining 7% had delays in two areas. The total number of delayed areas at the time of first meeting was unrelated to the length of time in institutions ($r(43) = .08$, $p = .61$), to whether the child had been considered a "favorite" ($M = 3.7$) or not ($M = 3.8$) in the orphanage ($t(36) = .31$, $p = .76$), or to the weight of the child for his or her age (Kendall's tau $b(37) = -.10$, $p = .24$).

Possibility of Selective Placement

Before discussing the children's progress at the time of the interview, it may be pertinent to mention here the

Table 4

Percentage of Children Delayed in Each Area of R-DPDQ at
First Meeting and at Time of Interview

	In institution when parents first met child (% delayed)	At time of interview (% delayed)
Fine-motor/adaptive	86	49
Gross motor	91	58
Personal-social	95	56
Language	100	61

N = 43

possibility of selective placement. Although uncommon in the field of adoption, parents of Romanian adoptees, for the most part, were able to pick the child they wanted to adopt from the children they saw in the orphanages. When asked in the interview, 41% of parents reported that they had chosen their child because they had "fallen in love" with him or her. Other parents said they chose their child because he or she was either the only one available (21%), a child for whom consent from the biological parents had already been obtained (14%), or the most attractive child available (12%). Small percentages of parents picked their child because he or she was part of a sibling pair (6%), or the youngest one available (6%).

Given that most children displayed delays in all areas of development when parents first met them, and that parents, for the most part, reported that they had adopted the children because they had "fallen in love" with them, there still remained the possibility that children who were doing better were picked by families with "better homes". There was no significant relationship, however, between quality of the home, as indexed by the additive variable of parental education, income, and SES, and number of delayed areas at time of first meeting, between quality of the home and weight of the child for his or her age, or between quality of the home and whether the child was a "favorite" or not in the institution. These relationships make it unlikely that the children were selectively placed in homes

of better quality.

Developmental delays at time of interview

At a median of 11 months post-adoption, parents completed the R-DPDQ a second time, this time describing their child's current abilities. The percentages of children delayed in the four areas of development are displayed in the right column of Table 4. There were no significant differences among the areas as to the number of children who were delayed (Cochran $Q(3) = 2.27, p = .52$). At the time of interview the number of delayed areas children displayed had reduced considerably. Thirty-five percent of children had no delays or a delay in only one area, 35% of children had delays in two or three areas, and 30% of children remained delayed in all four areas of development. The number of delayed areas was not related to whether the child had been a "favorite" ($M = 2.0$) or not ($M = 2.5$) in the institution, $t(36) = .98, p = .33$, but the longer the child had spent in institutions the greater the number of delayed areas post-adoption ($r(43) = .55, p < .001$). As well, the heavier the child at the time of the interview, the fewer areas of delay (Kendall's tau $b(35) = -.33, p < .01$).

Comparison of children adopted before and after two years

In order to address the hypothesis that children adopted after two years of age would display more delays

post-adoption than children adopted before two years of age, comparisons were made of their development using the R-DPDQ. Although there was no difference in number of delayed areas at first meeting between the younger (\underline{M} = 3.8) and older adoptees (\underline{M} = 3.8), the 29 children adopted under two years of age displayed significantly fewer delayed areas (\underline{M} = 1.8) at time of interview than did the 14 children adopted later (\underline{M} = 3.2), $t(41) = 3.39$, $p < .003$. As well, more of the younger children (85%) than of the older children (27%) had made up the delay in at least one area, $X^2(1, N = 43) = 15.13$, $p < .001$.

Analyses using the Revised Gesell Assessments

Although the results of the above analyses are consistent with the hypotheses that institutionalized children would be delayed in all areas of development at the time they first met their parents, and that children adopted after two years of age would exhibit more delayed areas than children adopted before two years of age, the crude nature of the R-DPDQ data is insufficient to make these assertions confidently. That is, the R-DPDQ only assesses whether a child is delayed or not delayed based on parental report; this leaves much open to question. Gesell assessments, done by independent testers, provide more extensive information on the degree of delay at the time of the assessment, and will therefore be used in the following analyses.

In order to assess the correspondence between parental

reports of the children using the R-DPDQ and the IDP consultants' assessments of the children using the Revised Gesell, point bi-serial correlations were computed (Table 5). All correlations were significant, except in the area of fine motor development, indicating that parental reports of their child's abilities corresponded well with the Revised Gesell reports done by independent assessors.

Children in the Infant Development Programme (IDP)

In order to be able to generalize results from the Gesell scores, it is important to compare children for whom such scores were available with those for whom they were not, that is, to compare those children whose parents enrolled them in the IDP versus those who did not. Although the Infant Development Programme is designed for children under the age of three years, due to their size and the degree of their delays some Romanian adoptees were enrolled in the programme even though they were as old as 40 months. For the sake of comparison, therefore, all children 40 months or younger at adoption were included.

There were no significant differences between children 40 months of age or less who were ($\underline{n} = 23$) and were not ($\underline{n} = 15$) enrolled in the IDP in how much time they had spent in institutions ($\underline{M} = 16.4$ vs $\underline{M} = 19.7$ months), or in the number of delayed areas reported by their parents on the R-DPDQ at first meeting ($\underline{M} = 3.7$ vs $\underline{M} = 3.8$) or at time of interview ($\underline{M} = 1.8$ vs $\underline{M} = 2.3$). There were also no significant

Table 5

Relation of R-DPDQ Done at the Time of Interview to Gesell
Developmental Quotients (DQs), by Area

	Gesell DQ within area		Point bi-serial correlation
	----- Delayed on R-DPDQ in area	Not delayed on R-DPDQ in area	
Gross motor	69.7	93.9	.58**
Fine motor	88.2	92.0	.11
Adaptive	78.6	87.1	.37*
Personal-social	71.6	90.1	.51**
Language	59.9	79.9	.55**

n = 23

* $p < .10$

** $p < .02$

differences between the two groups on the quality of the adoptive home ($\underline{M} = -.14$ vs $\underline{M} = -.11$). Significant differences were found, however, on extent of malnutrition, dirtiness, and favoritism in the institution. Children who were in the IDP weighed significantly less for their age at the time the parents first met them ($\underline{Mdn} < 5$ percentile) than did children not enrolled in the IDP ($\underline{Mdn} = 5-10$ th percentile), Mann-Whitney $\underline{U} = 52.5$, $\underline{p} < .005$, and they were more likely to have been considered "dirty or soiled" by their parents at first meeting (50%) than children not in the IDP (0%), $X^2 (1, \underline{N} = 33) = 3.28$, $\underline{p} = .07$. As well, children who were in the IDP were less likely to have been "favorites" (50%) than were children not enrolled in the IDP (67%), $X^2 (1, \underline{N} = 33) = 3.42$, $\underline{p} = .06$. These differences indicate that the children in the IDP had probably been more disadvantaged in the institution than the children not enrolled in the IDP.

Degree of Delay According to Gesell

Given that some children were assessed more than once during their time in the IDP and because assessments were done at various times for different children, it was decided that the assessment which took place closest in time to the family interview would be used in the following analyses. For some children ($\underline{n} = 10$), the assessment used was their first assessment, for others ($\underline{n} = 10$) it was their second assessment, and for the remaining children ($\underline{n} = 3$) it was

their third assessment. The mean age at the time of the Gesell assessment was 28 months, ranging from 15.5 months to 41 months, and the mean time between adoption and the Gesell assessment was 11 months, ranging from 3.5 to 23.5 months.

The Gesell developmental quotients (DQs) of the children are displayed in Table 6. Examination of the range of DQs reveals that although some children fell well below the average range of DQs (85+) (Knobloch et al., 1980), mean DQs in the areas of gross motor, adaptive and personal-social development were just below the average range, while children's mean fine motor development was at the low end of the average range. Children's mean language development, on the other hand, fell at the lower end of the borderline range (68-85) (Knobloch et al., 1980). Significant differences among areas of development on the Gesell assessments were found. A repeated measures analysis of variance (ANOVA) was performed on the Gesell DQs revealing a significant within-subject effect, $F(4,88) = 11.2$, $p < .001$. When t-tests were performed between adjacent ordered pairs, it was found that fine motor development was less delayed than adaptive development ($t(21) = 2.89$, $p < .01$), language development was more delayed than gross motor development ($t(21) = 3.07$, $p < .01$), and adaptive, personal-social, and gross motor development were not significantly different from each other.

Although differences were found among the areas of development, Gesell DQs were significantly positively

Table 6

Mean Gesell Developmental Quotients (DQs) by Area

Area of development	<u>M</u> + <u>SD</u>	Range
Fine motor	90.5 + 16.7	52-110
Adaptive	83.8 + 11.4	63-103
Personal-social	82.0 + 18.4	38-110
Gross motor	81.3 + 20.8	41-110
Language	70.4 + 18.1	39-103

n = 23

intercorrelated (Table 7) demonstrating that children who were doing well on any one area of the Gesell were doing well in the other areas of development.

Child characteristics associated with development

Age at adoption. The Gesell DQs of Romanian children adopted before and after two years of age were also compared (Table 8). Although the mean DQ of the five older adoptees was lower than the mean DQ of the younger children in all areas, the only significant difference was in the area of language development. Perhaps, however, these non-significant findings were due to the small number of children adopted after two years of age.

When length of time in institutions and Gesell DQs in each of the areas were correlated, significant associations were found for the areas of adaptive, personal-social, and language development (Table 9, first row), indicating that children who spent more time in an institutional environment had lower Gesell DQs in those areas.

Weight of the child. Malnutrition in the institution and malnutrition at time of interview, as indexed by the weight of the child for his or her age, were significantly related to Gesell DQs in certain areas of development. Weight of the child in the institution was positively related to gross motor, adaptive, personal-social, and language development, but at time of interview, the

Table 7

Intercorrelations among Gesell DQs in each Area of Development

Area of development	FM	A	PS	L
Gross motor (GM)	.59**	.71**	.75**	.62**
Fine motor (FM)	--	.75**	.61**	.51*
Adaptive (A)		--	.70**	.67**
Personal-social (PS)			--	.80**
Language (L)				--

n = 23

* $p < .02$ ** $p < .005$

Table 8

Mean Gesell DQs of Children Adopted Before and After Two
Years of Age, by Area

Area of development	Age at Adoption		<u>t</u>
	<u><</u> 2 years (<u>n</u> = 18)	> 2 years (<u>n</u> = 5)	
Gross motor	82.9	75.2	.76
Fine motor	92.0	85.1	.80
Adaptive	85.5	77.7	1.54
Personal-social	84.6	72.9	1.67
Language	74.6	55.2	3.18*

*p < .01

Table 9

Relation of Child Characteristics to Gesell DQs,
Within Each Area

	Gross motor	Fine motor	Adaptive	Personal social	Language
Time in institution ^a	-.25	-.15	-.37*	-.36*	-.57***
Weight (when met) ^b	.39*	.18	.31*	.47**	.45**
Weight (interview) ^c	.28*	.11	.20	.27*	.47**

^a_n = 23; ^b_n = 18 and ^c_n = 17 due to missing data.

Note: Kendall's Tau b statistic was used for the weight correlations due to the ordinal nature of the data.

*p < .10 **p < .05 ***p < .005

correlation with adaptive development was no longer significant (Table 9, second and third rows). These correlations indicate that the heavier (less malnourished) the child, the better he or she was doing at approximately a year post-adoption in these areas.

Favoritism. Although there were no differences in number of R-DPDQ delayed areas at first meeting and at time of interview between children who had been "favorites" in the orphanage and those who had not, more children who were "non-favorites" were enrolled in the IDP. Development of "favorite" and "non-favorite" children within the Infant Development Programme was also examined (Table 10). Children who were described as "favorites" in the institution had significantly higher DQs than "non-favorites" in all areas.

Sex of the child. Although no hypotheses were made regarding sex differences, analysis revealed that parents reported that girls exhibited more delays ($\underline{M} = 3.9$) on the R-DPDQ at the time of first meeting than did boys ($\underline{M} = 3.6$), $\underline{t} (41) = 2.46$, $\underline{p} = .02$. There were no significant differences between boys and girls, however, on amount of time spent in institutions ($\underline{M} = 21.8$ vs $\underline{M} = 21.1$ months), on weight ($\underline{Mdn} = 5\text{-}10\text{th}$ percentile vs $\underline{Mdn} < 5\text{th}$ percentile), or on being a "favorite" (60% vs 53%). At the time of

Table 10

Mean Gesell DQs of Children Described as Having Been
"Favorites" or "Non-favorites" in Romanian Orphanages

	Favorite (<u>n</u> = 7)	Non-favorite (<u>n</u> = 14)	<u>t</u>
Gross motor	91.0	77.3	1.74*
Fine motor	105.7	84.6	4.43***
Adaptive	92.0	82.1	2.84**
Personal-social	96.8	75.7	3.15**
Language	83.6	65.5	2.55**

Note: Only 21 of the 23 children in IDP are reported in this table because parents of two of the children had not been asked whether their child had been a "favorite" or not in the institution.

*p ≤ .10 **p < .03 ***p < .001

interview, no significant difference remained between boys (\underline{M} = 2.0) and girls (\underline{M} = 2.4) on the number of delayed areas on the R-DPDQ. There were also no significant differences between boys (n = 10) and girls (n = 13) in any of the areas of development as assessed by the Revised Gesell.

Characteristics of the Adoptive Family Associated with Development

Quality of the home. Table 11 displays the relationship between Gesell DQs and the quality of the home. Better quality homes were positively related to DQs in the area of adaptive, personal-social, and language development.

Effect of older siblings. Having older siblings within the adoptive family was not related to the young adoptees' DQs (Table 12). There were no significant differences in DQs between children with or without new siblings in any area of development. Of note, however, is the fact that 44% of the children with new siblings were having problems with their siblings, according to parental report. The most often reported sibling problem was avoidance of sibling's attention. When children having problems with their siblings (n = 7) were compared to children not having such problems (n = 9), the children with sibling problems displayed significantly lower DQs (\underline{M} = 76.7) in adaptive behavior (but not in any other area) than children without such sibling problems (\underline{M} = 88.0), t (14) = 2.08, p = .06.

Table 11

Relation of Quality of the Home to Gesell DQs,
within each Area

	Gross motor	Fine motor	Adaptive	Personal social	Language
Quality of home	.18	.29	.51**	.42*	.43*

n = 19

* $p < .06$ ** $p < .03$

Table 12

Gesell DQs of Children with or without Older Siblings within
the Adoptive Family

	With siblings (<u>n</u> = 13)	Without siblings (<u>n</u> = 10)	<u>t</u>
Gross motor	82.5	79.6	.32
Fine motor	90.7	90.2	.07
Adaptive	84.3	83.1	.26
Personal-social	84.4	79.0	.65
Language	70.9	69.7	.14

Gesell DQs of children who had siblings but were not having problems with them were not significantly different in any area from Gesell DQs of children who did not have siblings.

Rate of developmental progress

Fifteen of the children in the IDP had more than one Gesell assessment. Of the other eight children, two were too old to continue in the IDP after their first assessment, and four were released from the IDP after one assessment due to sufficient progress in their development to bring them up to standard. Two children were due to continue on in the IDP; however, only the assessment prior to the interview with the family has been received.

There were few differences between the children with one Gesell ($\underline{n} = 8$) and those for whom there was more than one Gesell assessment ($\underline{n} = 15$). Tests showed that there were no significant differences between the two groups in the length of time spent in the institution ($\underline{M} = 14.6$ vs $\underline{M} = 17.4$ months), in the weight of the children for their age at first meeting ($\underline{Mdn} < 5\text{th percentile}$ for both groups), or in the number of areas in which the children were delayed when their parents first met them ($\underline{M} = 3.9$ vs $\underline{M} = 3.6$) or at time of interview ($\underline{M} = 1.7$ vs $\underline{M} = 1.9$). There was also no significant difference between the groups in the quality of their homes ($\underline{M} = .67$ vs $\underline{M} = -.55$). Children with only one assessment, however, were more likely to have been "favorites" in the institutions (5/6) than were children

with more than one assessment (2/15), $X^2 (1, N = 21) = 6.56$, $p < .01$. The question regarding favoritism was not asked of parents of two of the children with one assessment. It is interesting to note that of the four children with only one assessment who were released because they had essentially "caught up" in their development, three had been "favorites"; unfortunately, the question of favoritism had not been asked at the interview with the fourth child's adoptive family.

The rates of progress in the different areas of development are found in Table 13. Rates were calculated by taking the difference between the developmental quotient at the first assessment and the developmental quotient at the last assessment, and dividing it by the elapsed time in months between the assessments. Theoretically, as normal children progress one developmental month for each chronological month, this would translate into 0 DQ points per month, that is, the DQ would remain unchanged. The Romanian children, in contrast, progressed at the rate of approximately 2 DQ points per month. There were no significant differences in the rate of progress among the different areas of development, $F (4,56) = .54$, $p = .71$.

Characteristics of the Child Associated with Rate of Progress

Status of child at first assessment. Table 14 (first row) displays the correlations between Gesell DQs of the

Table 13

Rates of Developmental Progress on Gesell by Area

Area of development	DQ points/month <u>M</u> <u>±</u> <u>SD</u>	range
Gross motor	2.70 <u>±</u> 1.90	-0.7 to +6.14
Fine motor	2.67 <u>±</u> 2.47	-1.6 to +6.95
Personal-social	2.35 <u>±</u> 1.57	-1.0 to +5.29
Adaptive	2.20 <u>±</u> 1.80	-1.3 to +5.15
Language	1.90 <u>±</u> 1.25	0.0 to +4.27

n = 15

Table 14

Relation of Child Characteristics to Rate of
Developmental Progress in Gesell DQs, within each Area

	Gross motor	Fine motor	Adaptive	Personal social	Language
DQ at 1st assessment ^a	-.46*	-.75**	-.79**	-.61**	-.59**
Time in institution ^a	.17	-.17	-.33	-.16	.29
Weight (when met) ^b	-.28	-.34	.03	-.22	-.34*
Weight (interview) ^b	-.49**	.00	.19	.27	-.19

^a_n = 15; ^b_n = 11 due to missing data.

Note: Kendall's Tau b statistic was used for the weight correlations due to the ordinal nature of the data.

*_p < .10 **_p < .05

child at the first IDP assessment and the rate of progress the child made in the respective area. The more advanced the child was in a particular area to begin with, the slower the rate of progress the child made.

Age at adoption. A comparison between children adopted before ($\underline{n} = 11$) and after two years of age ($\underline{n} = 4$) could not be made due to small cell sizes. The correlations between the amount of time in institutions and the rate of progress in the various areas of development are, however, displayed in Table 14 (second row). There were no significant associations, indicating that children who had spent a longer time in institutions were progressing at similar rates to those of children who had been institutionalized for shorter lengths of time.

Weight of the child. The extent of malnutrition, as indexed by the weight of the child for his or her age, was not generally related to rate of progress (Table 14, third and fourth rows). There were two exceptions, however, in that the heavier the child was when the parents first met him or her, the slower the rate of progress in language development, and the heavier the child was at time of interview, the slower the rate of progress in gross motor development.

Sex of the child. There were no significant

differences between boys and girls in their rates of progress in any area of development.

Characteristics of the Adoptive Family Associated with Rate of Progress

Quality of the home. Table 15 (first row) displays the correlations between the quality of the home and the rate of progress in development. There are significant negative correlations between quality of home scores and rate of progress in gross motor and personal-social development, indicating that children adopted into better quality homes were progressing at slower rates in these areas. Due to the significant negative correlations between DQs at time of first assessment and rates of progress in all areas of development (Table 14), DQs at first assessment were partialled out of the correlations between quality of the home and rate of progress in each area of development (Table 15, second row). After controlling for the negative relation between DQs at first assessment and rate of progress, no significant relationships remained between quality of the home and rate of progress in any area of development.

Effect of older siblings. There were no significant differences in rate of progress in any areas of development between children with older siblings in North America and children without older siblings (Table 16).

Table 15

Relation of Quality of the Home to Rate of Developmental
Progress in Gesell DQs, within each Area

	Gross motor	Fine motor	Adaptive	Personal social	Language
Quality of home	-.48*	-.29	-.19	-.57**	-.18
Quality of home ¹	-.30	-.15	.16	-.30	-.04

n = 13

¹Partial correlations after controlling for DQ at first assessment.

* $p < .10$ ** $p < .05$

Table 16

Rate of Progress of Children with or without Older Siblings
within the Adoptive Family

	With siblings (<u>n</u> = 9)	Without siblings (<u>n</u> = 6)	<u>t</u>
Gross motor	2.15	3.51	1.26
Fine motor	2.84	2.41	.30
Adaptive	2.13	2.31	.18
Personal-social	2.70	1.83	1.04
Language	1.97	1.94	.04

Discussion

The present study was undertaken in order to examine the deleterious effects of institution rearing on the cognitive development of Romanian orphans, and to chart their development and progress once they had lived in their adoptive homes in North America for approximately a year. Past research on the effects of institutionalization contains several methodological problems (Dennis, 1973; Flint, 1978; Goldfarb, 1945). Although the present study is an experiment in nature, complete with limitations and potential problems, it does attempt to answer some important questions that have yet to be empirically examined in the literature. Given that international adoption is on the rise, it is important to address such questions as: What are the effects of institutional rearing on a young child in the early years post-adoption?; and What influence does the adoptive family have on such a child? These questions are the focus of the present study. It must be remembered, however, that this study is descriptive of the Romanian sample only and therefore generalizability of the findings should be done with caution.

Two measures were used in the present study to assess the development of the young adoptees: the Revised Denver Prescreening Developmental Questionnaire and the Revised Gesell Developmental Schedules. Both measures have their advantages and disadvantages. The advantage of using the R-DPDQ is that there is information on all the subjects in the

sample, both at time of first meeting the child in the orphanage and at time of interview. The disadvantages are that the information is retrospective for the first time point, and that there is no information on degree of delay within a domain. The advantages of the Revised Gesell are that the assessments were done by independent testers and that there is information on degree of delay. The disadvantage is that Revised Gesell data are available only for a subsample of the children in the present study.

Effect of Institution Rearing on Development

The deprived and unstimulating environments of institutions have long been recognized as negatively influencing development in young children (Brossard & Decarie, 1971; Dennis, 1973; Goldfarb, 1943, 1945a, 1945b; Hunt, et al., 1976; Provence & Lipton, 1962; Spitz, 1945, 1946; Wachs & Gruen, 1982). The children reared in Romanian orphanages were no exception. As hypothesized, children in the present study displayed delays in all areas of development, according to parental reports of their child's abilities when parents first met them in Romania. Based on current North American standards all the children would have fit the criteria (at least two areas of delay) for further assessment by Public Health officials. As well, Romanian adoptees who were subsequently enrolled in the B.C. Infant Development Programme exhibited borderline range DQs in gross motor development, adaptive behavior, personal-social

development, and language, while their fine motor development averaged in the low end of the normal range. The high rates of progress in all areas of their development, however, were very encouraging. Romanian children enrolled in the IDP were progressing at a rate of approximately 2 DQ points per month, indicating that once exposed to a more stimulating environment, the children were making substantial gains in their development. Given that Gesell assessments were only available for children enrolled in the IDP, it is not possible to determine how much of the gain should be attributed to their home environments and how much to the Infant Development Programme.

Duration of Institutional Stay/Age at Adoption

The influence of duration of institutional stay on development has been reported in a number of studies (Dennis, 1973; Flint, 1978). Some effects of prolonged institutional stay were also found in the present study. Just as Flint (1978) and Dennis (1973) found that degree of delay in children was positively related to length of institutional stay, the number of areas of delay reported on the R-DPDQ 11 months post-adoption by parents in the present study was positively related to the time the child had spent in the institution. As the duration of institutional stay was almost perfectly correlated with age of the child at adoption, this means that the older the child was at adoption, the more areas of delay he or she exhibited.

Based on Dennis's (1973) claim that children adopted after two years of age displayed permanent impairment, the development of children in the present study was evaluated using age of adoption as a criterion. Consistent with the hypothesis, Romanian adoptees who were adopted after two years of age continued to display delays on the R-DPDQ in more areas of development several months post-adoption than did children who were adopted before two years of age.

The R-DPDQ data used in the computation of these results, however, do not provide a measure of the degree of delay within an area. Information from the Revised Denver Prescreening Developmental Questionnaire evaluates only whether a child is delayed or not delayed, compared to what 90% of the standardization sample could do. Some Romanian adoptees, therefore, may have just missed the cut-off between being considered delayed or not delayed, while others may have been many months behind in their development compared to non-institutionalized children their age. For this reason, comparisons were made between children adopted before and after two years of age using data from Revised Gesell developmental assessments, which describe the degree of delay in each area. No differences were found between the Gesell DQs of children adopted before and after two years of age, except in the area of language development, where children adopted after two years of age demonstrated significantly lower DQs than children adopted before two years. According to Gesell data, therefore, children

adopted after two years of age were no more delayed in their development in the other four areas than were the younger adoptees.

There are three possible reasons why the Gesell results do not agree with Dennis's (1973) claim of a two year cut-off between full recovery and permanent impairment. Firstly, some children in Dennis's younger group (under two years at adoption) had as little as one to three weeks experience in the institution before being adopted. Secondly, the older group in the present study did not include children over the age of 40 months at adoption because they were too old for the Infant Development Programme and thus were not assessed on the Revised Gesell. If Gesell scores had been available for these older children, perhaps there might have been significant differences in the development of children adopted before and after two years of age. Thirdly, small cell sizes in the present study, especially for children adopted after two years of age ($n = 5$), may have contributed to non-significant differences.

Given that children in the present study are still very young, the majority under four years at time of interview, the question of whether there is a two-year cut-off on subsequent development cannot be answered at this point in time. Even Dennis (1973) could not have been certain of his claim of a permanent impairment in children adopted after two years of age, as some of the children in his study were

last tested when they were under 10 years of age.

On a more general level, however, disregarding the two-year cut-off, degree of delay in development was related to time in the institution. Significant negative correlations were found between time in institution and Gesell DQs for language, adaptive and personal-social development, i.e., in all areas of development except gross motor and fine motor. Provence and Lipton (1962) found that children who had been institutionalized and were subsequently adopted improved in areas in which they could learn through imitation and repetition. Gross motor development involves learning how to walk, climb stairs, and throw a ball, while fine motor development includes facility in tower-building with one-inch cubes, picking up pellets with a neat pincer grasp, and threading a needle. Perhaps these motor behaviors are not as affected by extent of institutional stay because they can quite easily be learned through repetition and imitation. Adaptive, personal-social, and language development, on the other hand, pertain to more culture-specific and complicated tasks, such as drawing, understanding spatial relations with formboards, toilet training, carrying breakables, and understanding English words. Perhaps the longer a child is exposed to a different culture (orphanage life), the more difficult the transition is to a new culture, i.e., the longer the adjustment period before learning culture-appropriate behavior.

The pervasive negative effect of institutionalization

on language development has been reported in the past. Language development has been reported to be the most delayed area in institutionalized children (Goldfarb, 1945b; Provence & Lipton, 1962). At 11 months post-adoption, the children in the present study were more delayed in language development than in any other area of the Gesell, and the longer the child had been institutionalized, the more severe the delay. Given that the children in the present study had not only been exposed to minimal amounts of one-on-one language stimulation but also to a different language, and given that (older) children who had been institutionalized longer were exposed to the Romanian language for longer periods than were younger children, this effect on language is not all that surprising.

Contrary to the claims of Goldfarb (1945b) and Provence and Lipton (1962) that the area of language development displays the slowest rate of improvement in institutionalized subsequently adopted children, children in the present study progressed in language development at the same rate as in other areas of development. At the present time, therefore, there is no evidence to uphold these previous claims. Provence and Lipton's (1962) impressions of slower progress in language were based on observations of some of the children, while Goldfarb (1945b) presented assessment data on 15 children. Only longitudinal monitoring of children in the present study will reveal whether, in the long run, their rate of progress in language

will differ from that of progress in other areas.

Effect of Malnutrition

Malnutrition has been shown to affect cognitive development (Frank & Ziesel, 1988; Sigman et al., 1991). Although malnutrition was not directly measured in the present study, the majority of Romanian children fell well below the normal weight curve for their age when parents first met them in the orphanage. As well, the extent of their malnutrition was related to their Gesell DQs: the smaller or more malnourished the child was at the time the parents first met the child in the orphanage, the less cognitively advanced the child was post-adoption. Even though children gained weight once they were adopted, the weight of the child for his or her age at time of interview was also positively related to his or her Gesell DQs in gross motor, personal-social, and language development. Given that children had spent only small amounts of time in Canada at time of interview (for some, less than one year), it is difficult to say whether the negative effects of malnutrition will be permanent. All that can be said is that at a median of 11 months post-adoption, children who had been and/or continued to be most underweight were the ones who did most poorly on the Gesell.

Influence of the Adoptive Family

Another potential influence on the adoptees'

development examined in the present study was quality of the adoptive home, as indexed by level of parental education, family income, and socioeconomic status. It has been claimed that children adopted into "better homes", in which parents have high levels of education and high incomes, demonstrate above average IQs (Clarke & Hanisee, 1982; Winick et al., 1975). The relationship between parental education/income and children's cognitive development was not, however, empirically tested in these previous studies. Rather than assessing whether there was a relationship between these variables, the authors (Clarke & Hanisee, 1982; Winick et al., 1975) simply asserted that above average IQs in the adoptees were a function of the "better homes" provided by their adoptive parents. In the present study, children living in higher quality homes were performing at higher levels on the Gesell in the areas of adaptive, personal-social, and language development. As discussed earlier, these three areas of development are more complicated and culture-specific, and it therefore seems appropriate that they bear a stronger relationship to the quality of the home than does motor development, which can proceed through imitation and repetition.

Maternal education and income have been shown to correlate positively with Caldwell and Bradley's Home Observation for Measurement of the Environment (HOME; 1984), which assesses aspects of the home environment such as intellectual stimulation, presence of books and toys, and

mother-child interaction (Shonkoff et al., 1992; Yeates et al., 1983). It is assumed that it is these aspects of home environment that mediate the relationship between the home quality measure employed in the present study and Gesell DQs, but future research is needed to examine directly whether these HOME scores are what influence the development of Romanian adoptees.

When the influence of home quality on the rates of progress in the different areas of development was examined, a seemingly contradictory relationship was found. Rates of progress in particular areas of development were negatively related to quality of the home, that is, "better homes" were associated with slower rates of progress in both gross motor and personal-social development. To assess whether this contradictory finding was influenced by the negative relationship found between DQ at first assessment and rate of progress, DQ at first assessment in each area was partialled out. After controlling for this variable, no significant correlations remained between quality of the home and rate of progress in any area. This indicates that the quality of the home, although positively influencing the development of the adoptees in the areas of adaptive, personal-social, and language development, did not seem to influence the rate of their progress. This finding is consistent with the results of a recent study by Shonkoff et al. (1992) who followed the development of handicapped children undergoing early intervention services. These

authors also did not find that family characteristics, such as maternal education, or HOME scores were related to the rate of development of the children.

Influence of Older Siblings

The potential positive influence of having older Canadian siblings was also examined in the present study. Lamb (1978a, 1978b) found that older siblings may facilitate their younger siblings' mastery of the object world, and Woollett (1986) proposed that older siblings provide a stimulating and highly complex environment for their younger siblings. The presence of older siblings in the home in the present study, however, did not seem to be related to the development of Romanian adoptees; there were no differences in DQs or rates of progress in any area of development between children with and children without Canadian siblings. These results are consistent with Clarke and Hanisee's findings (1982) that presence of older siblings in the adoptive home did not influence the development of young Asian adoptees who had suffered disruptive early childhood experiences.

One possibility for the non-significant findings, however, is that although older siblings may serve as role models and create a stimulating environment for their younger siblings, young children who have never interacted with older children may have a difficult or inhibited reaction to their new siblings. Almost half of the adoptive

parents in the present study who already had children when they adopted a young Romanian reported that the young adoptees had problems with their new siblings in Canada. Parents reported such problems as the adopted child avoiding the sibling's attention, the adopted child being jealous or competing for the parent's attention, and the adopted child being overwhelmed by the sibling's attention. When children with sibling problems were compared to children without sibling problems, children without sibling problems demonstrated significantly higher DQs in the area of adaptive behavior than did children with sibling problems. Thus, the Romanian child's negative reaction to his or her new sibling(s) may have attenuated any positive influence of having siblings.

A second possible explanation for non-significant differences between children with siblings and without siblings on their Gesell DQs and rates of progress could be that in families with older children there may be constraints on the amount of time parents can interact with the adoptive child. In otherwise childless adoptive families, a single adoptee might receive greater stimulation from his or her parents than would a child with older siblings.

Favoritism

The present study also addressed the potential beneficial influence of favoritism. Although there was no

relationship between favoritism and delays using the crude measure of the Revised Denver Prescreening Developmental Questionnaire, favoritism was associated with higher Gesell DQs in all areas of development. Children in the IDP who had been orphanage "favorites" displayed higher levels of development than their peers who had not been "favorites". Fewer parents of "favorite" than parents of "non-favorite" children enrolled them in the Infant Development Programme, and more of these "favorite" children were discontinued from the IDP due to the fast progress they made.

Favoritism in institutions is not a new concept, nor is it specific to Romanian orphanages. In 1956, Spitz wrote about one favorite child in the nursery where he studied the effects of maternal deprivation on infants:

The one child who could speak, walk, dress itself, and eat alone, and who was toilet-trained, was of an angelic beauty - just like an angel by Raphael - and no person who came into that nursery failed to stop at the child's bed and talk and play with it. Every nurse stooped down to tickle its chin, every doctor stopped and spoke to it, and so this was the one child among these foundling home children who really did get something in the nature of emotional interchange with another human being (pp. 106-107).

Provence and Lipton (1962) reported that being a nurse's favorite, which meant an qualitative difference in stimulation, influenced development as evidenced by more adequate progress in the favored child compared to most of the children in the wards.

The question is, what made some children "favorites"? Children deemed "favorites" in the present study had not

spent any more or less time in institutions, and were not more or less attractive, as rated by the interviewer from pictures taken in the orphanage or shortly thereafter, than children deemed "non-favorites", and there were no sex differences in the number of "favorites". Parents of "non-favorites", however, were more likely than parents of "favorites" to report that their child was left dirty or soiled in the institution, and "non-favorites" weighed less than "favorites" at the time their parents first met them. These relationships do not reveal direction of effect, however, i.e., it is not clear whether children became "favorites" because they were heavier or cleaner, or whether because they were deemed "favorites" they were fed more and cleaned up more often. Unfortunately, there are no data on other characteristics of the "favorites", such as their interaction skills or their temperament, something that could set them apart from the rest and potentially reveal some indication of direction of effect.

An example of the positive influence of child characteristics was addressed in the longitudinal study undertaken on the island of Kauai (Werner, Bierman, & French, 1971; Werner & Smith, 1982). The researchers found that children who had been perceived by their caretakers as very active and socially responsive, and who elicited a great deal of attention during the first year of life from their caregivers had higher scores on the Cattell Infant Intelligence Scale and the Vineland Social Maturity Scale at

2 years of age than did children who did not exhibit these characteristics in infancy but who came from similarly stressed or low socioeconomic backgrounds. Perhaps then it was something within the "favorite" children, i.e., their capacity to elicit and respond to stimulation, or their experience with being stimulated, that facilitated "favorite" Romanian children's development post-adoption.

Contributions of the Present Study and Plans for Future Research

What advances in knowledge were made in the present study? After all, past research had already demonstrated that institutional-rearing was detrimental to cognitive development, and that the longer the stay in the institution, the greater the delay in development. What new information has been revealed by the present study? Firstly, it has provided improved evidence for points that were already addressed in the literature. Previous studies have generally had very small samples, so replication of their results is important.

Secondly, in some instances the present study has obtained more precise measures of effects. For example, the present study has provided an estimate of progress during the first year of post-adoptive life; children were progressing approximately 2 DQ points per month. Follow-up of these children should include examination of whether this rate continues until they reach normal levels of

development, or whether the rapid rates of progress are simply short-term reactions to the children's exposure to a more stimulating environment.

A third major contribution of the present study was examination of the influence of the adoptive family on the child. Past research has alluded to such influence, but this study was the first to actually measure the effects of higher quality homes and older siblings on the development of adoptees from institutions. Future research should investigate other aspects of the adoptive family and characteristics of the home environment that may influence the development of these children.

Finally, the present study also addressed one aspect of institutional life that has received only brief mention in past research, that is, favoritism. Future research should examine more closely the characteristics of "favorites" and chart the progress made by these children post-adoption to examine the longer term effects of having been a "favorite" in the institution.

Future research will be necessary to investigate the cognitive development of these children after they have had more time to adjust to their new environments. Issues that could not be addressed, given the age range of the sample in the present study, would include later problems in concreteness of thought, difficulty in making transitions, and persistent language difficulties (Goldfarb, 1943; Flint, 1978; Provence & Lipton, 1962).

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