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Developmental delays and adoption : a longitudinal study

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DEVELOPMENTAL DELAYS AND ADOPTION: A LONGITUDINAL STUDY

A Thesis

Presented to

the Faculty of the Department of Psychology

San Jose State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

Wendy J. Wedl

August, 1992

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Abstract

DEVELOPMENTAL DELAYS AND ADOPTION: A LONGITUDINAL STUDY

by Wendy J. Wedl

The trend of development for children adopted from foreign countries was investigated. Twenty-six male and female subjects were evaluated using the Diagnostic Inventory for Screening Children (DISC), covering eight developmental areas: fine motor, gross motor, receptive language, expressive language, visual attention and memory, auditory attention and memory, self-help, and social. Subjects, age 1 to 40 months, were assessed to determine the extent of developmental delays. Rate of recovery from these delays was tracked one year to evaluate the effects of the new environments. Subjects adopted before 6 months were compared to those adopted after 6 months.

Trend analyses indicate that while the trend of development for subjects adopted before 6 months was nonsignificant for receptive language and auditory attention and memory, there were significant linear trends for those adopted after 6 months. Both groups had significant trends for gross motor skills. It appears that critical areas in language and motor skills can be influenced by enriching environment.

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Thank you, Andrew, for your encouragement, mental support, and patience waiting for me to get back to a normal life!

TABLE OF CONTENTS

SECTION	PAGE
INTRODUCTION	3
METHOD	9
Subjects	9
Materials	9
Procedure	10
RESULTS	12
DISCUSSION	23
REFERENCES	31
APPENDICES	35
Appendix A. Signed Approval Forms	36

LIST OF TABLES

TABLE		PAGE
1	<u>Means and Standard Deviations of the Developmental Scales for Each Test Session</u>	14
2	<u>MANOVA of Developmental Scales and Test Sessions by Age at Entry . . .</u>	17
3	<u>MANOVA of Test Session and Age at Entry</u>	19
4	<u>Analysis of Variance for Test Session by Age at Entry for Each Significant Two-Way Interaction</u>	20

LIST OF FIGURES

FIGURE	PAGE
1 Overall Trend	24
2 Gross Motor	25
3 Receptive Language	26
4 Auditory Attention and Memory	28

Developmental Delays and Adoption: A Longitudinal Study

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Running head: DEVELOPMENTAL DELAYS AND ADOPTION

Footnote

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Abstract

The trend of development for children adopted from foreign countries was investigated. Twenty-six male and female subjects were evaluated using the Diagnostic Inventory for Screening Children (DISC), covering eight developmental areas: fine motor, gross motor, receptive language, expressive language, visual attention and memory, auditory attention and memory, self-help, and social. Subjects, age 1 to 40 months, were assessed to determine the extent of developmental delays. Rate of recovery from these delays was tracked one year to evaluate the effects of the new environments. Subjects adopted before 6 months were compared to those adopted after 6 months. Trend analyses indicate that while the trend of development for subjects adopted before 6 months was nonsignificant for receptive language and auditory attention and memory, there were significant linear trends for those adopted after 6 months. Both groups had significant trends for gross motor skills. It appears that critical areas in language and motor skills can be influenced by enriching environment.

Developmental Delays and Adoption:

A Longitudinal Study

For the thousands of children adopted in the United States from foreign countries each year, their varied and most often deprived early environments may present severe problems for both adoptive parent and child alike. Theoretically, scientists fail to agree on the magnitude of the effect the environment has on development. Some scientists support the theory of John Locke who felt that an infant is born a *tabula rasa*, a blank slate upon which early experience "writes" a child's development. Others agree with Jean Jacques Rousseau who believed that an infant has a predetermined path of development which is set in the "stone" of its genetic makeup (Thomas, 1979). Realistically, however, most scientists realize that dynamically, there are effects from genetics, effects from the environment, and effects from the interaction of the two (Bohman, 1981). This study will focus on the environment's possible effects on an adopted child's development.

Children adopted from other countries have often faced incredible hardships prior to their adoption. These children are often orphans due to war, with extended family unwilling or unable to care for them. The child may have been given up at birth since the single mother or parents could not afford to raise the child because of poverty or limited resources. The lack of food or money results not only in the child's placement for adoption but increases the chance of pre-natal malnutrition and often a complete lack of medical care for the expectant mother or newborn child. As

research has shown, neurological problems can develop in response to these stressors (Brozek, 1978). Low birth weight can signal difficulties during intra-uterine development.

Walther (1988) found that infants born with a low birth weight were more likely to exhibit soft neurological signs at birth and develop problematic behavior, academic difficulties, and neurological dysfunctions at 3 and 7 years of age. Walther defined "low birth weight" as below the 10th percentile for gestational age. Using pediatric growth curves, a low birth weight infant born at a gestational age of 9 months would be less than 2.7 kg (Chow, Durand, Feldman, & Mills, 1984). Pre-natal malnutrition, especially severe protein deficiency, can also effect somatic growth, CNS growth and development, metabolism, and organ functions as well as behavior (Brozek, 1978; Cusminsky, 1984; Riccuitti, 1981a, 1981b; Winick, Meyer, & Harris, 1975). Lien, Meyer, and Winick (1977) found significant interaction effect between malnutrition and late adoption, and reported that age at adoption might be an important predictor of mental development. As expressed by Winick et al. (1975), severe malnutrition appears to exacerbate the developmental retardation that occurs under poor socio-economic conditions.

It has been seen that early neurological damage can affect subsequent mental and physical development. Negative effects can also occur when there is a deprivation of social stimulus as well. In a review of deprivation literature, Rutter (1972) stated that past research supports the notion that deviations in language, social, and motor

development are reported as early as the second year when there was experiential (social) deprivation. This delay is apparently a result of a lack of stimulation. In a review paper, MacDonald (1985) reported that strong attachments are critical between 6 months and 3 years. If these attachments are not made, behavioral problems can develop. Pringle and Bossio (1960) found some maladjustments for those children separated early from their home, with none of the maladjusted group developing stable relationships with parent figures. The institutional rearing which can accompany familial separation has also been found to be accompanied by intellectual impairment (Hersov, 1985), especially in the first 2-3 years of life. Later social difficulties can occur, as can problems with language development (Bohman & Sigvardsson, 1979; Campion & Wohlfarth, 1989; Hersov, 1985; Kujiraoka, 1989), but perceptual-motor skills are apparently less susceptible to influence (Rutter, 1972).

Parent-child separations and institutionalization do not always lead to emotional or social difficulties or character defects (Pringle & Bossio, 1960). Tizard and Rees (1975) found that if a child was separated from the family at an early age and placed in an adoptive home by four years of age, normal affectional bonds can develop. A sensitive period starting at 1 year of age was found by Bohman and Sigvardsson (1979), with adverse outcomes not common if institutional rearing was restricted to the first year. This longitudinal study followed the subjects until they were 15 years old.

There is research, however, which contradicts the assertions of a strong influence solely from a single environmental risk factor. Riccuitti (1981b) found little evidence of direct and independent effects of malnutrition in producing intelligence or learning deficits. In a literature review by Brozek (1978), no consistent relation was found between nutritional intake and psychological performance. He also stressed that other variables work synergistically with malnutrition, such as low income, poor living conditions, family disorganization, and apathy. Most researchers now stress that the effects of biological risk factors work in conjunction with adverse social and environmental conditions (Brozek, 1978; Harbin, Gallagher, & Terry, 1991; Riccuitti, 1981a, 1981b; Winick et al., 1975).

Developmental delays can occur due to the influence of genetics, poor pre- and perinatal care, low birth weight, malnutrition, experiential deprivation, institutional care, and more importantly, the interaction of these factors. Other environmental and socio-economic influences can exacerbate the problems (Ensher, 1989).

Developmental delays are not universal, however, as evidenced by the conflicting results discussed above. It has also been suggested that these delays do not necessarily need to be permanent, as the following research demonstrates. Despite finding that institutional rearing in the first 2-3 years of life can lead to social difficulties, Hersov (1985), asserted that there was resilience in human functioning which allows for a child to "catch up" developmentally if given the appropriate care. Clark and Hanisee (1982), assessing Asian adoptees placed in America, reported no

indicators of disabling developmental delays after two years of placement in their adoptive homes despite sufficient background data to predict such delays.

Considering such factors as low birth weight (Resnick, Eyler, Nelson, Eitzman, & Bucciarelli, 1987), malnutrition (Ricciuti, 1981a, 1981b; Rosenzweig, 1981; Winick et al., 1975), and overall environmental deprivation (Richardson & McLaughlin, 1981), deprived environmental factors can be compensated for if intervention occurs early enough. Winick et al. (1975), in a study which used dietary supplements for a group of malnourished subjects, pointed out that for a delayed child to develop adequately, environmental enrichment must be of long duration. This enrichment can include improved medical care and nutritional supplements but may also be as simple as increased perceptual, tactile, and social stimulation (Rutter, 1972). In a broad review of the literature, Tizard (1991) concluded that difficulties will be more widespread and of longer duration the older the child at adoption.

Concepts which are important to consider when trying to understand the implications of timing for environmental effects on development include sensitive periods and developmental plasticity. A sensitive period is viewed as one during which the developmental course of a particular characteristic is highly influenced by both positive and negative factors. When evaluating some of the aforementioned research, a sensitive period between the first one to two years of life appears important for intervention to ameliorate such factors as low birth weight, malnutrition, and institutional living (Bohman & Sigvardsson, 1979; Resnick et al.,

1987; Ricciuti, 1981a, 1981b; Winick et al., 1975). However, as emphasized by Clarke and Clarke (1976) in their critical literature review, a sensitive period is difficult to define since chronological age and mental age are not good indicators of development. They also assert that one stage is not clearly more formative than another. An alternative to the sensitive period model is an interactional model of development, one based on the concept of developmental plasticity.

Plasticity has been defined by MacDonald (1985) as an individual's relative susceptibility to environmental influences. There is evidence that individuals differ across a wide range in the ages at which basic cognitive competencies emerge and developmental milestones are attained. Kagan and Klein (1973) present the belief that there is a potential discontinuity of development in response to changing environmental demands. It appears that after a time of maximum plasticity, considerable time and environmental enrichment are needed to reverse the effects of early deprivation.

With most intercountry adoptions, descriptions about the birth mother, pregnancy, complications in delivery, medical records, and a child's experiences before adoption are inaccessible to researchers and adoptive parents alike. Despite this informational handicap, the question arises that if the children are developmentally delayed, will their development be significantly affected by adoption. It was assumed that delays would be present due to the probable environmental and experiential deprivation of children adopted from the foreign countries selected for

this study. It is hypothesized that the age of the child at entry into the country for adoption would effect their subsequent development. Age at entry is important when investigating the existence of a sensitive period for environmental influences. It is also hypothesized that the trends of development will be significantly different depending on the age at entry, with the developmental quotient being higher after one year. This longitudinal study is designed to test these hypotheses and provide more information about the effects of intercountry adoption on development.

Method

Subjects

Twenty-six (10 male and 16 female) foreign born children of mixed ethnic background were involved in this study. The country of origin was either in Asia, Central or South America, or the Pacific Islands. Their ages at entry into the United States ranged from 1 to 40 months. The screening method to obtain the subjects will be discussed in detail in the Procedure Section.

Materials

The assessment tool used was the Diagnostic Inventory for Screening Children (DISC), Second Edition, a standardized screening kit developed by the Kitchner-Waterloo Hospital in Ontario, Canada (Amdur, Mainland, & Parker, 1988). The DISC was selected because it was the only assessment kit for the 0-5 year old age bracket which covers wide areas of functioning: fine motor, gross motor, receptive language, expressive language, auditory attention and memory, visual

attention and memory, self help, and social skills. The kit contains toys and objects which are used to test this inventory of skills. The items are grouped into 11 age brackets: 0-3 months, 4-6, 7-12, 13-18, 19-24, 25-30, 31-36, 37-42, 43-48, 49-54, 55-60. The examiner marks whether or not the child accomplishes each task until the child cannot complete any task in the age bracket. The DISC is criterion and norm referenced, with the standardization and normative data based on a sample of Canadian children. The limitations of this standardized sample are discussed further in the analysis section.

Procedure

The names of potential subjects were obtained by referral from the Bay Area Adoption Service Agency (BAAS) of Campbell, California. The BAAS Agency handles intercountry adoptions for prospective adoptive parents living in the San Francisco Bay Area. All adoptions which occurred involving a child 4 years old or younger were eligible for the study. A phone call was made to the adopting parents describing the proposed project. The first 26 children whose parents gave consent for participation were involved in the study. A total of 39 families eligible for this study were contacted.

Once the parents had given consent for their adopted child to participate in the project, appointments were made to conduct the assessment in the home. Parents were given a Consent Form for Minors to sign. Following the standardized test procedures, the assessment was conducted in a quiet, well-lit room which was familiar

to the child. Young infants were seated in an infant carrier or placed on a mat. Toddlers and young children were either in a high chair or on the floor. The parent or caregiver present was asked to remain at a distance from the child and to refrain from offering assistance or comments until after the assessment was completed. Some items required the parent or caregiver's report. The child was asked to play with some of the toys the examiner brought and when possible the examiner talked with the child in an attempt to relax the child and develop a rapport. Once the child appeared comfortable, the assessment began. When the child refused to respond to an item, the examiner continued and returned twice to the refused item at a later time until it was completed or considered a non-completion. The testing time ranged from 30 minutes to 1 hour 30 minutes, depending on the age of the child and their willingness to cooperate. Subjects were tested within 7 weeks of their arrival into the United States, and three more times at intervals of 4 months.

Raw scores were collected and a developmental quotient (DQ) was calculated by dividing the "test age" by the chronological age. A control group was not used because the raw data for this project was compared to the set of norms established by the DISC normative study (Amdur et al., 1988), to determine the "test age."

The sample for the normative study included 573 children between birth and 5 years with no suspicion of developmental delay. Approximately 50 children were assessed from each of the 11 age brackets, plus approximately 70 more children to establish the observer and re-test reliability. The sample was collected to reflect the

population of children in the regions of Ontario, Canada, where the data to develop the test were gathered. Of the 573 involved in the study, 304 of the sample were male and 269 were female. Almost 95% of the sample were Caucasian. The means and standard deviations for the 11 age groups were used to develop the normative scale.

There are several reasons for using this DISC normative scale to score the data used in these analyses despite apparent cultural differences. Most significant is that this assessment is not being used diagnostically so questions of cultural fairness were felt to be of less importance. The DQ was used solely to describe development while evaluating changes in the trend of this development over time, not the absolute level of development. A majority of the items were culture-reduced items, where no specific prior information for a "pass" score was required. The subjects were also adopted by North American families, so the physical and developmental growth expectations of the adopting parents will be similar to that of the normative study subjects. Since there is no alternative measure for the age range 0-5 years measuring the variables of interest in the study, the only alternative would have been to develop a new measure and such a new measure would have no norms.

Results

Descriptive statistics (means and standard deviations) were calculated for the developmental quotient of the two levels of the quasi-independent variable (adoption before 6 months of age and after 6 months of age) on each of the eight developmental

scales (fine motor skills, gross motor skills, receptive language, expressive language, auditory attention and memory, visual attention and memory, self-help skills, and social skills). Of the 26 subjects, 14 had entered the United States before 6 months of age and 12 had arrived after 6 months of age. These results are presented in Table 1. The means show an initial delay in the developmental quotient as subjects were testing at less than their chronological age. The means also increased in the developmental quotient over the four test sessions.

In order to test the hypothesis that the development of subjects would be significantly affected over time by what age they entered the United States, the primary analysis involved a multivariate repeated measures analysis of variance with the 8 Developmental Scales as the dependent variables and 2 independent variables (Age at Entry and Test Session). There were two significant main effects: Test Session, $[F(3,60) = 44.37, p < .001]$ and Developmental Scale $[F(7,140) = 19.50, p < .001]$. In evaluating the overall trend of development over time for the three-way analysis, it was found that the change of the mean scores over the four test intervals (Test Session) showed a significant linear trend $[F(1,20) = 74.24, p < .001]$, supporting the hypothesis that there would be a significant increase in the developmental quotient during the first year following adoption. There were also two significant two-way interactions: Age of Entry by Developmental Scale $[F(7,140) = 2.15, p < .05]$, and Test Session by Developmental Scale, $[F(21,420) = 5.11, p < .001]$. These results can not be directly interpreted, however, because a

Table 1

Means and Standard Deviations of the Developmental Scales for Each Test Session

	Test Session			
	1	2	3	4
<hr/>				
Fine Motor				
^a <u>M</u> Before 6 mos.	83.09 (30.19)	96.99 (13.83)	105.06 (19.12)	116.84 (12.38)
^b <u>M</u> After 6 mos.	94.75 (17.59)	99.62 (23.23)	109.57 (24.48)	121.39 (18.14)
Receptive Language				
^a <u>M</u> Before 6 mos.	92.82 (19.11)	89.03 (17.85)	87.43 (6.30)	84.34 (15.59)
^b <u>M</u> After 6 mos.	67.31 (11.20)	80.98 (22.12)	90.27 (17.73)	100.72 (18.57)
Expressive Language				
^a <u>M</u> Before 6 mos.	75.19 (29.30)	81.77 (22.89)	89.56 (17.54)	93.60 (27.87)
^b <u>M</u> After 6 mos.	68.72 (14.36)	72.62 (18.42)	89.62 (22.27)	91.73 (18.21)
Gross Motor				
^a <u>M</u> Before 6 mos.	82.06 (22.46)	79.65 (15.80)	100.01 (28.85)	128.12 (20.76)
^b <u>M</u> After 6 mos.	71.21 (13.24)	97.90 (35.38)	120.25 (29.94)	126.65 (16.92)

(table continues)

Test Session

1 2 3 4

Auditory Attention and Memory

^aM Before 6 mos. 96.17 (29.02) 111.41 (18.52) 106.77 (12.93) 97.18 (9.85)

^bM After 6 mos. 78.12 (17.75) 95.80 (16.90) 91.75 (15.40) 100.96 (23.73)

Visual Attention and Memory

^aM Before 6 mos. 86.13 (21.75) 84.97 (9.80) 90.01 (10.13) 109.07 (13.86)

^bM After 6 mos. 77.43 (13.70) 87.88 (14.42) 91.68 (24.33) 98.12 (19.54)

Self Help

^aM Before 6 mos. 81.75 (19.57) 113.18 (20.46) 120.57 (34.71) 134.15 (25.77)

^bM After 6 mos. 86.18 (26.94) 107.83 (19.28) 113.95 (17.13) 120.20 (11.42)

Social

^aM Before 6 mos. 83.01 (23.72) 107.93 (13.79) 118.55 (26.93) 143.80 (31.42)

^bM After 6 mos. 86.07 (20.95) 98.55 (15.61) 111.98 (20.86) 124.86 (23.67)

^an = 14

^bn = 12

significant three-way interaction was obtained [$F(21,420) = 2.66, p < .001$] (see Table 2).

In order to determine the basis of the significant three-way interaction, further analysis was conducted to test the hypothesis that the trends for development on each scale would be significantly different depending on the age at entry. Separate tests of the two-way interaction of test session by age at entry were conducted for each developmental scale. A significant two-way interaction between Test Session and Age at Entry was found for the developmental scales of Receptive Language [$F(3,60) = 8.50, p < .005$], Gross Motor [$F(3,60) = 4.69, p < .005$], and Auditory Attention and Memory [$F(3,60) = 2.77, p < .05$] (See Table 3).

To investigate the source of the significant three-way interaction, trend analyses for each age group was conducted for each scale which exhibited a significant two-way interaction between Test Sessions and Age at Entry. As seen in Table 4, results for Receptive Language reveal that while those who arrived before 6 months did not demonstrate a significant difference in development over the 4 sessions, those who arrived after 6 months did [$F(3,27) = 12.92, p < .001$]. Significance was also found for that linear trend [$F(1,9) = 59.45, p < .001$], while the quadratic trend was nonsignificant. This same pattern is found for Auditory Attention and Memory, with those arriving before 6 months having nonsignificant results while those arriving after

Table 2

MANOVA of Developmental Scales and Test Sessions by Age at Entry

Summary of the Analysis				
<u>Source of Variation</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>
Within Cells	76522.48	20	3826.12	
Age at Entry	963.20	1	963.20	.25
Within Cells	35792.27	60	596.54	
Test Session	79411.37	3	26470.46	44.37**
Age at Entry by Test Session	1359.60	3	453.20	.76
Within Cells	71166.68	140	508.33	
Developmental Scale	69391.42	7	9913.06	19.50**
Age at Entry by Developmental Scale	7653.81	7	1093.40	2.15*

(table continues)

Summary of the Analysis

<u>Source of Variation</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>
Within Cells	99443.40	420	236.77	
Test Session by Developmental Scale	25432.46	21	1211.07	5.11**
Age at Entry by Test Session by Developmental Scale	13202.43	21	628.69	2.66**

* $p < .05$

** $p < .001$

Table 3

MANOVA of Test Session and Age at Entry

Summary of the Analysis				
Source of Variation	SS	df	MS	F
Receptive Language				
Within Cells	12036.36	60	200.61	
Test Session	1703.61	3	567.87	2.83*
Age at Entry by Test Session	5115.46	3	1705.15	8.50****
Gross Motor				
Within Cells	18408.95	60	306.82	
Test Session	32600.19	3	10866.73	35.42****
Age at Entry by Test Session	4321.45	3	1440.48	4.69***
Auditory Attention and Memory				
Within Cells	12196.13	60	203.27	
Test Session	2806.42	3	935.47	4.60**
Age at Entry by Test Session	1650.54	3	550.18	2.77*
<p>*$p < .05$ **$p < .01$</p> <p>***$p < .005$ ****$p < .001$</p>				

Table 4

Analysis of Variance for Test Session by Age at Entry for Each Significant Two-Way Interaction

Summary of the Analysis				
Source of Variation	SS	df	MS	F
<hr/>				
Receptive Language				
Before 6 months				
Within Cells	7980.23	33	241.83	
Test Session	515.82	3	171.94	
After 6 months				
Within Cells	4506.13	27	150.23	
Test Session	5820.97	3	1940.32	12.92**
<hr/>				
Gross Motor				
Before 6 months				
Within Cells	10222.10	33	309.76	
Test Session	18556.32	3	6185.44	19.97**
After 6 months				
Within Cells	8186.85	27	303.22	
Test Session	18381.24	3	6127.08	20.21**

(table continues)

Source of Variation	SS	df	MS	F
Auditory Attention and Memory				
Before 6 months				
Within Cells	8018.54	33	242.99	
Test Session	1907.24	3	635.75	2.62
After 6 months				
Within Cells	4177.59	27	154.73	
Test Session	2496.18	3	832.06	5.38*

* $p < .005$

** $p < .001$

6 months showed a significant difference [$F(3,27) = 5.38, p < .005$]. The trend analysis again demonstrated a significant linear trend [$F(1,9) = 5.75, p < .05$], and a nonsignificant quadratic trend. On the Gross Motor Scale, both groups of subjects had significant differences in scores across test sessions. Specifically, for the subjects who entered the country before 6 months, there was significant differences between scores [$F(3,33) = 19.97, p < .001$], and both a significant linear trend [$F(1,11) = 38.49, p < .001$], and a significant quadratic trend [$F(1,11) = 11.35, p < .01$]. Those arriving after 6 months had significant differences between scores [$F(3,27) = 20.21, p < .001$], and a significant linear trend [$F(1,9) = 102.60, p < .001$].

In summary, the first analysis conducted was a three-way repeated measures analysis of variance. While there were significant main effects for test session and developmental scale, the significant three-way interaction necessitated further analysis. Two-way ANOVA's for each of the eight developmental scales were computed, with the Receptive Language, Auditory Attention and Memory, and Gross Motor scales having significant Test Session by Age at Entry interaction. Subsequent trend analyses indicate that while the trend of development for subjects arriving into the country before 6 months was nonsignificant for Receptive Language and Auditory Attention and Memory, there were significant linear trends for those arriving after 6 months. Gross Motor Skills of both groups had significant trends, as well.

Discussion

The results of this study support the hypothesis that while developmental delays are present for individuals adopted from foreign countries, these delays no longer remain for most subjects after one year. The significant results of the three-way interaction suggests there were differences in the change of the developmental quotients on the developmental scales from one time to the next for those adopted before and those adopted after 6 months (see Figure 1). Surprisingly, the simple effect of age at entry was nonsignificant. There was, however, a significant linear trend, demonstrating the presence of an accelerated maturational rate or resiliency for subjects, despite age, once adopted into an enriched environment during the first year following adoption.

Three developmental scales stood out as unusual, however, when individually analyzing the relationship between age at entry and test score for each developmental scale, demonstrated with the trend analysis results. There were significant trends for both groups on the gross motor scales. Figure 2 shows large increases in these gross motor skills over the one year. These results could be explained by many variables including improved nutrition, medical care, and environmental situation. On the other hand, Figure 3 shows that for receptive language there was a difference between those

Figure 1

Overall Trends

Figure 2

Gross Motor Skills

Figure 3

Receptive Language

who arrived before 6 months of age and those who arrived after 6 months of age. More specifically, those who arrived after 6 months had significant results on the trend analysis showing a gain in their developmental quotient, while those who arrived before 6 months did not. These subjects actually dropped 8.5 points on their scores over one year. Figure 4 visually demonstrates the same type of results for the auditory attention and memory with a significant upward trend occurring for those arriving after 6 months. For those subjects arriving before 6 months, while the scores rose for the second session, they subsequently dropped to only one point above their initial scores. The differences in developmental trends over the one year time may be accounted for by the critical change of language that the subjects heard during the sensitive period of language development. This is speculation, however, and warrants further study.

Interpretation of the results of this study is limited by characteristics of the sample population and other confounding factors. Uncontrollable variables such as unknown pre-adoption medical histories, varying cultural background, and possible gender differences may have affected the significance of the results. The subjects were members of a narrowly defined, purposive sample of children with biases occurring during placement, selection for the study, and the small sample size. Reactivity may have occurred for the subjects because observation of a behavior directly influences that behavior, as well as the potential presence of demand characteristics or a systematic bias by the interviewer.

Figure 4

Auditory Attention and Memory

All of the above mentioned confounds are inherent in an initial study of this magnitude. Future research can easily address these issues by increasing the sample size and scope of the population studied, obtaining more demographic and medical information for the period prior to placement, and evaluating such potentially confounding variables as previous placement, gender, and country of origin, to name but a few. An evaluation of the adoptive home environment is also critical since, as stressed by researchers Hemmeter and Kaiser (1990) as well as Ensher, developmental delays "may precipitate familial reactions that disrupt the normal course of parent-child interaction" (Ensher, 1989, p. 81). It is this transactional process between child and family which will in turn affect the child's development and recovery from any adverse outcomes of their previous environment.

Future research should also be longer duration longitudinal studies to catch any changes in development over the childhood of the individual. "Catch-up" effects may not be long lasting, as evidenced by the pilot research of Scarborough and Dobrich (1990). Assessing four children diagnosed with early language delays, severe early deficiencies improved to normal or near-normal levels by the age of 5. However, all but one subject subsequently developed reading disabilities. Moxley-Haegert and Ladd (1989) also found that significant decreases in developmental delays were not maintained several years later.

It is important to stress that the majority of children that are adopted either from within or outside of the United States have no more problems than the general

non-adopted population (Tizard, 1991). The results of this study, as well as past research, are heartening since they suggest that for those children that are developmentally delayed, an inborn resiliency can help them overcome difficulties with the help of an enriched environmental change. For prospective adoptive parents, this can provide hope that the child they adopt can become a healthy, normal family member. While there can be no individual guarantees and initially things might be difficult, these children have promising futures ahead of them.

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To: Wendy Wadl, Psychology
18575 Old Monterey Road
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From: Charles R. Bolz
Office of Graduate Studies and Research

Date: November 22, 1990

Charles R. Bolz

The Human Subjects Institutional Review Board has approved your request to use human subjects in the study entitled:

"Developmental Delays and Adoption: A
Longitudinal Study"

This approval is contingent upon the subjects participating in your research project being appropriately protected from risk. This includes the protection of the anonymity of the subjects' identity when they participate in your research project, and with regard to any and all data that may be collected from the subjects. The Board's approval includes continued monitoring of your research by the Board to assure that the subjects are being adequately and properly protected from such risks. If at any time a subject becomes injured or complains of injury, you must notify Dr. Serena Stanford immediately. Injury includes but is not limited to bodily harm, psychological trauma and release of potentially damaging personal information.

Please also be advised that each subject needs to be fully informed and aware that their participation in your research project is voluntary, and that he or she may withdraw from the project at any time. Further, a subject's participation, refusal to participate or withdrawal will not affect any services the subject is receiving or will receive at the institution in which the research is being conducted.

If you have any questions, please contact Dr. Stanford or me at (408) 924-2480.

cc: Kevin Jordan, Ph.D.

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May 10, 1991

TO: Wendy Wedl, MA candidate

FROM: Kevin Jordan, MA Coordinator

RE: Design and analysis review

I have received and reviewed your response to the concerns expressed by Dr. Fox and me about your MA thesis proposal. Based on your revisions and your elaborations of detail (a copy has been inserted into your file), the proposal is approved.

Given this committee's approval, the collection of data for your thesis is approved contingent on documentation of compliance with university policy regarding the use of human subjects in research. University policy requires approval of your project by the Human Subjects Institutional Review Board. Please provide me with a file copy documenting such approval as soon as you receive it. After that copy is part of your file, you may begin collecting data.

Congratulations on your progress to date! We look forward to the continuation of your fine performance in the program.

cc:
Cooper
Eldred
Fox
Jordan
file