AN ABSTRACT OF THE THESIS OF

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Title: Contributions of Family Size, Birth Order, Socioeconomic Status, and Parent-Child Relationships To Young Children's Intellectual Development

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The purpose of this study was to investigate the relationship of family size, birth order, socioeconomic status, and parent-child relationships to young children's intellectual development.

Seventy-four children, 39 boys and 35 girls, with a mean age of 4 years-8 months, and their parents (mothers and fathers), selected from 9 preschool programs and daycare centers in Corvallis, Oregon, acted as subjects for this study. Ninety-five percent of the families came from upper or upper-middle socioeconomic classes. All the families were intact, consisting of children and their biological parents, representing one-, two, and three-child families. The children in this study were either first-, second- or third-born children.

Family socioeconomic status was determined via Hollingshead's Four Factor Index of Social Status. Information on family size and birth order was obtained through a Demographic Questionnaire. Parent-child relationship was assessed via the Parent Attitude Research Instrument- Short Form. Children's intellectual level was measured with the Peabody Picture Vocabulary Test-Revised. Zajonc and Markus' Confluence...
Theory, Page and Grandon's Admixture Theory, and Falbo and Polit's Parent-Child Relationships Theory were utilized as the basis for investigating the relative contributions of family size, birth order, socioeconomic status, mother-child relationship, and father-child relationship to children's intellectual development. The regression procedure was used in data analyses. The .05 probability level was used as the criterion for statistical significance.

Findings revealed that the variables of socioeconomic status and quality of father-child relationships contributed significantly to children's intellectual development. The higher the socioeconomic status of the family, and the more supportive the father-child relationships, the higher the children's intellectual development scores. Birth order and family size made no contributions to children's intellectual development. These findings, therefore, provided support for Page and Grandon's Admixture Theory and Falbo and Polit's Parent-Child Relationships Theory, but not for Zajonc and Markus' Confluence Theory.
CONTRIBUTIONS

OF

FAMILY SIZE, BIRTH ORDER, SOCIOECONOMIC STATUS, AND

PARENT-CHILD RELATIONSHIPS

TO

YOUNG CHILDREN'S INTELLECTUAL DEVELOPMENT

by

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INTRODUCTION

Researchers have long had an interest in studying only-children. Over the past century, numerous studies have been conducted exploring the relationships between being an only-child and various personality and adjustment outcomes (Falbo & Polit, 1986). These studies have reflected a need for more investigations of only-children from both theoretical and practical perspectives.

Compared to the existence of other sibling or family structures involving multiple children, the emergence of only-child families (i.e., one-child families) can be described as a relatively new phenomenon. As a result, researchers have begun to ask questions about whether the path that only-children take, relative to aspects of their developmental progress, are similar to or different from those who come from other sibling or family situations.

From a practical point of view, the present world trends in fertility suggest a need for more studies of only-children. Newman (1990), for example, reported that in the United States, only-child families constituted approximately 30 percent of all families in the population. This population is growing for a variety of reasons, including economic hardship, marital disruption, contraceptive technology, and women in the work force (Falbo, 1984; Newman, 1990). Interestingly, some families have tried to avoid having
only one child because of the negative image attached to only-children or one-child families, although they may prefer such a family structure (Falbo, 1984; Soloman, Clare, & Westoff, 1956). As early as 1972, Gallop poll results revealed that a majority of white Americans preferred two-child families (Falbo, 1984). This, coupled with the negative ways in which only-children and one-child families are perceived, has led some to have a second child.

Research conducted on the consequences of being an only-child has, thus far, not shown a very uniform pattern. However, in recent years, studies have generally demonstrated that only-children are not disadvantaged in contrast to children from multiple-child families, comparing favorably with them in many ways (Falbo, 1984). Unfortunately, however, the only-child research literature can be characterized as lacking guidance from formal theory, with a majority of studies motivated by either curiosity or convenience (Falbo & Polit, 1986). Of those studies motivated by some form of formal theory, two types are identified by Falbo and Polit (1986). These include (a) application of a theoretical approach initially developed for a different purpose (Zimbardo & Formica, 1963 -- using Social Comparison Theory to explain the relationship between self-esteem and birth order), and (b) application of a theoretical approach focused on issues of birth order and family size (Zajonc & Markus, 1975 -- using Confluence Theory to explain the negative relationship between family size and intellectual development).

With respect to the theories associated with the relationship between being an only-child and intellectual development, three approaches have thus far been proposed in the literature. These include (a) Zajonc and Markus' (1975) Confluence Theory, (b) Page and Grandon's (1979) Admixture Theory, and (c) Falbo and Polit's (1986) Parent-Child Relationships Theory.

Confluence Theory views the child's intellectual development as a function of the intellectual levels of all members within the family system (Zajonc & Markus, 1975).
According to this theory, each successive child is born into a successively poorer intellectual environment, and thus, will have a successively poorer intellectual development. Only-children, however, are exceptions to this rule. Since the only-child lacks someone younger to teach things to, such a child will not develop intellectually as well as first-born children.

In contrast to Confluence Theory, Admixture Theory (Page & Grandon, 1979) proposes that a child's intellectual level is determined by certain demographic variables such as ethnic group membership and social class rather than birth order and family size. Page and Grandon (1979) argue that children from large minority families score more poorly on intellectual tests than those from small families because this may be a reflection of the socioeconomic class of the family. Individuals of lower socioeconomic status tend to come from large families, and lower socioeconomic status has been found to be related to lower intelligence scores (Binet & Simon, 1916; Cropley, 1964; Eells, Davis, Havighurst, Herrich, & Tyler, 1951; MacArthur & Elley, 1963; Kennett & Cropley, 1970).

Contrary to both Confluence and Admixture Theories, a more recent theory proposed by Falbo and Polit (1986) emphasizes the importance of parent-child relationships in the intellectual development of only-children. According to this theory, higher intellectual levels would be expected among only-children, because only-children have many more opportunities to interact with parents than children from multiple-child families, thus increasing their potential for positive relationships with parents. These positive relationships with parents tend to facilitate only-children's development, particularly intellectual abilities.

To date, research associated with theoretical approaches linking "being an only-child" and intellectual development have occurred relatively separate from each other. It seems unusual that researchers in this area have not attempted to examine how
combinations of these variables might impact an only-child's intellectual development, since understanding human behavior involves far more complex approaches than relying on a very limited number of characteristics to explain its occurrence. For this reason, the present study attempts to explore how well variables from Confluence, Admixture, and Parent-Child Relationships theories together explain the intellectual level of young children. These include family size and birth order from Confluence Theory, socioeconomic status from Admixture Theory, and aspects of parent-child relationships from Parent-Child Relationships Theory. Specifically, this study attempts to explain how these variables together might explain the intellectual development of children three to six years of age.

Definition of Terms

The following definitions were employed for relevant terms found within the thesis:
1. Family size -- refers to the number of children in the family. The family sizes examined in this study included one-, two-, and three-child families.
2. Birth order -- refers to the ordinal position of a given child in relation to his/her siblings in the family. The earlier the birth, the higher the birth order.
3. Socioeconomic status -- refers to a family's social position. This was measured in two ways in this study. First, via the present social status of the family by taking into consideration husbands' and wives' education and occupation. Second, since a few parents in the present sample were college students, not yet established in a profession, the social
status of their parents was assessed to obtain an estimate of their social status. This was
done by taking into consideration their parents' education and occupation.
4. Intellectual level -- refers to an individual child's IQ score. It was assessed in terms
of children's receptive language abilities as determined by the Peabody Picture Vocabulary
Test - Revised.
5. Quality of Parent-Child Relationships -- refers to a combination of two styles of
parent-child relationships, including authoritarian and warm parenting styles. In
combination, these two dimensions measure parents' support of their children. The more
authoritarian the parents, the less likely they are willing to listen to their children's ideas,
the less likely to be responsive to their children's feelings and needs, and less likely to be
involved in their children's life while the opposite is true for warm parents. Both fathers'
and mothers' parent-child relationship styles were assessed.

Assumptions

The following assumptions were made in this study. They included:
1. The Peabody Picture Vocabulary Test-Revised (PPVT-R; Dunn & Dunn, 1981) is
a reliable and valid measure of intellectual level among preschool aged children.
2. Hollingshead's Four Factor Index of Social Status (FFISS; Hollingshead, 1975) is
a reliable and valid measure of socioeconomic status among families.
3. The Parent Attitude Research Instrument-Short Form (PARI-SF; Cross &
Kawash, 1968) is a reliable and valid measure of fathers' and mothers' authoritarianism and
warmth, which can be combined to assess each parent's support of the child.
Data Analyses

Regression analysis was used to examine the relative contributions of family size, birth order, socioeconomic status, mother-child and father-child relationship scores to children's intellectual development.
REVIEW OF LITERATURE

This review of literature is divided into two major parts. Part I focuses on summarizing various theories and related research linking "being an only-child" and intellectual development. Part II presents a conceptual model that emerges from an integration of theories and research summarized in Part I.

Part I: Only-Children and Intellectual Development

As indicated previously, three theoretical approaches can be identified that explain the relationship between "being an only-child" and intellectual development. These theories include: (a) Confluence Theory (Zajonc & Markus, 1975), (b) Admixture Theory (Page & Grandon, 1979), and (c) Parent-Child Relationships Theory (Falbo & Polit, 1986; Polit & Falbo, 1988). Each of these theories and related research is reviewed below.

Confluence Theory

Confluence Theory (Zajonc & Markus, 1975) has been the most popular theory used in studying the relationships between family size, birth order, and intellectual development in children. According to this theory, a child's intellectual development can be regarded as a result of mutual influences among children and parents within the family
system during the course of development. The intellectual level of all family members (i.e., siblings, parents, and the individual child) contributes to the formation of the intellectual environment in which family members grow up. It is this intellectual environment that provides the basis upon which an individual develops intellectual abilities.

An assessment of the intellectual environment of the family is obtained by averaging the absolute intellectual levels of individuals within the family. A parent's intellectual level is assigned an arbitrary 100, while a newborn is assigned an arbitrary zero. Thus, before any child is born, the intellectual environment of an intact family would be:

\[
\frac{100 + 100}{2} = 100 \quad \text{parent + parent} = \text{intellectual family size environment}
\]

When the first child is born, the intellectual environment of that same family would be:

\[
\frac{100 + 100 + 0}{3} = 67 \quad \text{parent + parent + child family size}
\]

When the second child is born, assuming the first child has gained an intellectual level of 40, then the intellectual level of this family would be:

\[
\frac{100 + 100 + 40 + 0}{4} = 60
\]

When the third child is born, assuming the first child has gained an intellectual level of 50, and the second child an intellectual level of 30, then the intellectual level of the family would be:

\[
\frac{100 + 100 + 50 + 30 + 0}{5} = 56
\]

As seen in the example above, each successive child is born into a successively inferior intellectual environment to start with, and, therefore, will develop a successively lower intellectual level at the end. This leads to the prediction made on the basis of
confluence theory that the larger the family, the lower the intellectual level of later-born children.

However, only-children are exceptions to the above prediction. They do not possess the highest intellectual levels when compared to oldest siblings from larger families. In fact, their intellectual levels are somewhat lower than those of first-born children. The reason why this lower-than-expected intellectual level occurs among only-children is because of their lack of opportunity to teach someone younger in the family. The teaching experience, according to Zajonc and Markus (1975), is beneficial to children's intellectual development. Deprived of such teaching experiences, only-children, therefore, do not do as well as first-born children on intelligence tests. To accommodate for this difference between only-children's observed and expected intellectual levels, Zajonc and Markus (1975) added to their confluence model another variable, identifying whether the child of interest was an only-child. Furthermore, information about whether or not the child of interest was the last-born child would be important, since, like the only-child, such a child would not have the opportunity to teach a younger sibling, thus lowering the child's intellectual level.

An additional variable considered by Confluence Theory to be important in accounting for the discrepancy between the intellectual levels of only- and first-born children from multiple-child families was the age at which intelligence testing was done (Zajonc, Markus, & Markus, 1979). Confluence Theory argues that only-child effects are age-dependent, and had different effects at different points in life. At first, first-born children would be negatively affected by the presence of a younger sibling because the latter's entering the family dilutes the overall intellectual environment of that family. In contrast, only-children do not suffer from such a handicap because no newborns are present to dilute their overall intellectual environment. Therefore, only-children do not suffer any intellectual loss as first-born children do when a second child is born. However,
the disadvantage of first-born children in multiple-child families and the advantage of only-
children begin to change as they grow older. With the second-born child's maturation, the
intellectual environment of the family is gradually improved, and the first-born child is also
provided with an opportunity to teach the younger sibling, leading to an advantage over
only-children in intellectual development. Zajonc and his colleagues (1979) predicted that
this advantage of first-born children over only-children would occur at about adolescence.

Since the development of Confluence Theory, a large number of studies have been
conducted to test the validity of such a theory in explaining the relationships among
family size, birth order, and children's intelligence. For example, Zajonc and Bargh (1976
a), in studying the relationships between confluence variables and SAT scores of subjects,
obtained data that fit the model well. Likewise, Davis, Cahan, and Bashi (1977), using an
Israeli sample, obtained results that were predicted on the basis of Confluence Theory.
Other supportive studies summarized by Page and Grandon (1979), are available,
however, results obtained were predictive only on the basis of aggregate data. Most of
the other studies conducted, in one way or another, did not provide results in support of
Confluence Theory.

McCutcheon (1977), in a study of 291 students, 18-25 years of age enrolled in
community college psychology classes, found little support for Confluence Theory. He
reasoned that failure to find supportive results may have been due to the: (a) use of
different measures of intellectual ability, (b) cultural differences between the Dutch and
American samples, and (c) small differences that existed between different family-sibling
groupings, although in the direction of the confluence model. The need for a large sample
to detect predicted differences does make one doubt the practicality of using the
confluence model to explain the relationships among family size, birth order, and
intellectual development among children. In fact, in this study, no differences were found
between only-children and children from other family-sibling groupings in intellectual
levels. Grotevant, Scarr, and Weinberg (1977), using regressions to analyze their data, instead of Zajonc and Markus' confluence equation, found that their data on individual differences in intelligence could not be well explained by the confluence model. Confluence variables in the regression model accounted for only 1 percent to 4.5 percent of the variance in individual intelligence test scores. According to these researchers, while the use of aggregate data to explain the relationships among family size, birth order, and intelligence among children provided general trends as predicted on the basis of Confluence Theory, it could not explain such relationships at the individual level.

In an effort to test the generalizability of the confluence model, Pulvino and Lupton (1978) conducted a study using a sample of gifted and talented high school students from small (one- or two-child), medium (three- or four-child), and large (five- or more-child) families. The Terman Concept Mastery Test was used as a measure of intelligence. Findings revealed significant differences between children from small and large families, and small and medium families in intellectual levels, as would have been predicted on the basis of Confluence Theory. No such difference was found, however, between medium and large families. No birth order differences were found in small families as predicted by Confluence Theory.

However, researchers believed that the differences found between children from small and large families, and small and medium families in intellectual levels, were small in magnitude when compared with the large sample size used, and no conclusions about individual families could be made on the basis of the data, since aggregate group analyses were employed. In addition, only-children were not separated in the sample, but included with first-born children in the small family group for analyses. Results obtained in support of the confluence model, therefore, were questionable.

In a similar study by Steelman and Mercy (1980), a large sample of children ages 6 to 11 were used as subjects. The Vocabulary and Block Design Subtests of the WISC
were used as measures of intelligence. Findings obtained partially agreed and partially disagreed with predictions made on the basis of Confluence Theory. As with Confluence Theory, the number of siblings within the family exerted an important effect on children's intellectual development. The larger the number of siblings in the family, the lower the intellectual level of the child. Unlike Confluence Theory, however, no birth order effects were found. In fact, the socioeconomic class of families from which children came was the most powerful predictor of children's intellectual performance, although the number of siblings in the family was a significant predictor as well.

With respect to studies focused on the intellectual levels of only- and last-born children in comparison to other family-sibling groupings, Steelman and Mercy (1980) failed to obtain findings in support of the confluence model of lower intellectual levels experienced by only- and last-born children. Such a finding was found only among those from families with incomes below the poverty level. Because of this, Steelman and Mercy (1980) argued that factors other than lack of opportunity to teach a younger sibling must be influencing only- and last-born children's intellectual levels. Only- and last-born children from high socio-economic classes may not show lower intellectual levels than children from other family-sibling groupings, because such families can provide their children with group care experiences wherein interactions with age mates do occur, thus, benefiting their intellectual level. On the contrary, those from lower socioeconomic classes do not have the resources to access such beneficial interactional experiences.

Another large study was conducted by Svanum and Bringle (1980), evaluating the impact of family size and birth order on the intelligence and achievement of 7,060 6- to 11-year-olds. The Vocabulary and Block Design Subtests of the WISC and Reading and Arithmetic Subtest of the Wide Range Achievement Tests were used to assess subjects' intelligence and achievement, respectively. Results obtained were similar to those of Steelman and Mercy (1980) just described. Socioeconomic class was the most powerful
predictor of children's intellectual performance, followed by the number of siblings within the family. Therefore, while the confluence model of family size was in part upheld, family size accounted for only 3 percent of the variance and was not the most powerful predictor. In addition, this study did not provide findings clearly supporting the age-dependent relationships among family size, birth order, and intellectual performance among only- and first-born children. According to Confluence Theory, only-children would have an advantage over first-born children in intellectual development at an early age, but this advantage would reverse itself as they grew older. This means that there should be a linear decline in intellectual performance among only-children as they progressed in years from 6-7, 8-9, and 10-11. However, such a progression was not found in this study. Instead, only children, ages 8-9, were found to have the lowest intelligence scores.

Furthermore, no significant relationships were found between birth order and intellectual ability within each specified family-size grouping (i.e., the younger the sibling, the lower the intellectual level). Confluence Theory, therefore, was again not supported.

According to Confluence Theory, the presence of an additional adult or the absence of a parent will influence children's intellectual development. The former would likely enhance the intellectual development of children due to an increase in the intellectual environment of the family with the addition of another adult [i.e., \((100 + 100 + 100 + 0)/4 = 75\)], while the latter would likely inhibit the intellectual development of children due to the decrease in the intellectual level of the environment as a result of an adult's absence [i.e., \((100 + 0)/2 = 50\)]. Using a large sample of 5,300 children 4-7 years of age, and the WISC to assess children's intelligence, absence of the father did not affect children's intellectual ability when socioeconomic status was controlled. In fact, in places where significance did occur among children of various ages, controlling for socioeconomic status led to the finding that children from father-absent families had higher intelligence scores.
Finally, with respect to Confluence Theory's expectation that the tutoring effect on first-born children's intellectual development would occur a few years after the second child was born, Brackbill and Nichols (1982) could find no data in support of such a proposition when using children at 4 and 7 years of age as subjects. Interestingly, neither could Falbo and Snell (1982) find any support for such sibling teaching effects among 152 senior and freshman student pairs involved in simulated tutoring experiences consisting of tasks associated with space and vocabulary. Results indicated that teaching someone younger does not necessarily lead to a significantly greater change in ability and task performance than being taught by someone (older or younger) or teaching oneself.

In summary, research associated with Confluence Theory has failed to provide convincing evidence in support of its efficacy in explaining the relationships among family size, birth order, and children's intellectual development. While the use of aggregate data to test propositions from Confluence Theory did provide some research support, such support was greatly reduced when data were analyzed at the individual level (Galbraith, 1982a, 1982b; Grotevant et al., 1977; Page & Grandon, 1979; Pulvino & Lupton, 1978). This discrepancy, therefore, made findings at the aggregate level of analyses highly suspect.

In addition, failure to control for a number of confounding variables such as socioeconomic status and ethnic group membership, also made the limited findings obtained in support of Confluence Theory questionable. In fact, some studies indicated that socioeconomic status and ethnic group membership were more powerful predictors of children's intellectual performance than family size (Page & Grandon, 1979; Svanum & Bringle, 1980).

Furthermore, the inconsistency among findings across a number of studies associated with the effects of birth order (Page & Grandon, 1979; Svanum & Bringle, 1980), father-absence (Brackbill & Nichols, 1982), and sibling tutoring (Falbo & Snell,
1982) on children's intellectual development does not support the power of Confluence Theory in explaining the relationships among family size, birth order, and children's intellectual development. It appears that one must continue to look beyond Confluence Theory to understand the complex relationships between these variables.

Admixture Theory

Unlike Confluence Theory, Admixture Theory (Page & Gandon, 1979) takes an alternative perspective regarding the relationships among family size, birth order, and the intellectual development of children. According to Admixture Theory, the intellectual disadvantage of children from large families is attributable to demographic factors, such as socioeconomic status and ethnic group membership, rather than family size and birth order. It should be made clear, however, that the role of ethnic group membership does not indicate that being from a minority ethnic group makes one automatically lower in intelligence. Members of minority groups are often found among the poor in our society, and such lower socioeconomic circumstances take their toll on children's intellectual development. Page and Grandon (1979) reached this conclusion on the basis of a study involving a large sample of subjects who participated in the U.S. National Longitudinal Study of Education Effects (NLS) in an attempt at gaining a better understanding of the relationships among family size, birth order, and mental ability.

Page and Grandon (1979) found, as expected, that when the data were analyzed aggregately, a large amount of the variance in subjects' intelligence scores was explained by the family size and birth order variables (i.e., 60% for the NLS sample). However, when data were analyzed on an individual level, the amount of variance explained by these variables markedly decreased (i.e., 5% for the NLS sample), indicating that family size and
birth order made only minor contributions to explaining differences in subjects' intelligence scores.

In addition, path analyses involving socioeconomic status, ethnic group membership, and family size variables revealed that the family size variable had only a small direct impact (r = -.19, p = -.08) on subjects' intelligence scores, in comparison to the impact of socioeconomic status (r = .38, p = .028) and ethnic group membership (r = .36, p = .027). In fact, the standard deviation associated with family size represented only about one point difference in subjects' intelligence scores, while a standard deviation associated with socioeconomic status and ethnic group membership was associated with a nine or more points difference among subjects' intelligence scores (Page & Grandon, 1979).

Furthermore, Page and Grandon (1979) found only a negligible family size effect among the intelligence scores of white subjects from higher socioeconomic classes, but an only-child effect among the intelligence scores of Black subjects from higher- and middle-socioeconomic classes in a manner converse to that predicted on the basis of Confluence Theory. Upper- and middle-class Black only-children had higher intelligence scores than upper- and middle-class Black children with younger siblings. Moreover, Page and Grandon (1979) observed that the influence of family size on children's intelligence scores decreased with an increase in the socioeconomic level of subjects. Therefore, it was concluded that the general relationship between family size and children's intellectual development was attributable to such variables as socioeconomic status and ethnic group membership rather than family size.

Finally, concerning birth order effects, Page and Grandon (1979) reported lower intelligence scores among only-children than children from two-, three-, or four-child families. According to these researchers, these findings are a reflection of the admixture
factors on children's intelligence, since among lower socioeconomic classes, there are more only-children and larger families than two-, three-, or four-child families.

Studies exist in which variables from Admixture Theory have been used to investigate children's intellectual development. For example, research by Binet and Simon (1916), Eells his colleagues (1951), MacArthur and Elley (1963), Cropley (1963), and Kennett and Cropley (1970) have provided findings in support of the notion that a positive relationship between socioeconomic class and children's intelligence does exist.

Other studies (Kennett and Cropley, 1970; Willoughby & Coogan, 1940) have demonstrated a relationship between family size and socioeconomic status. Lower socioeconomic status families tend to be large, while the converse appears true for upper-socioeconomic class families. The negative relationship between family size and intellectual ability, therefore, may actually be a correlation between socioeconomic status and intelligence. In fact, this appeared to be true in a study by Kennett and Cropley (1970), which examined a sample of 170 middle- and upper-class Protestant children, grades six through eight. Findings revealed that subjects' intelligence scores were positively related to socioeconomic status, with children from higher socioeconomic status families having higher intelligence scores. No evidence was found relative to the relationship between family size and subjects' intelligence scores across the full sample or within separate socioeconomic status groups.

Additional evidence in support of Admixture Theory was also obtained by CIGDEM KAGITCBASI (1979), who investigated a large sample of grade school children from Turkey, including families from a variety of socioeconomic backgrounds. Findings revealed socioeconomic status to be positively related to the perceptual-cognitive functioning of these children. Higher socioeconomic status children performed much better than lower socioeconomic status children on various perceptual-cognitive tasks. The researcher suggested that the reason why this occurred may have been due to
increased cognitive functioning experiences of children from higher socioeconomic status homes in comparison to children from lower socioeconomic status homes. This may have been possible due to the availability of resources higher socioeconomic status families have in providing their children with cognitively enriched environments.

While a number of research findings point to the important contribution socioeconomic status and ethnic group membership make to the development of children's intellectual development, studies also exist which fail to support such a proposition. For example, Falbo and Polit's (1986) and Polk and Falbo's (1988) meta-analytic studies found that it was the positive relationship between children and their parents from small families (i.e., especially one-child families) that appeared to be responsible for their children's higher intellectual performance. Mellor (1990), in an additional study, using different data analyses procedures also obtained similar results. The results of these studies and others will be discussed later, when considering the third theoretical perspective.

In summary, according to Page & Grandon (1979), evidence in favor of Admixture Theory as an approach to explaining the relationships among the variables of family size, birth order, and children's intellectual development can be described in the following manner. First, in a number of studies, findings associated with the multivariate relationships between the variables of family size, socioeconomic status, ethnic group membership, and children's intellectual development provided support for Admixture Theory explanations. In addition, in studies where different socioeconomic status and ethnic group membership were examined in relation to their specific profiles, the relationship between family size and children's intellectual development was greatly reduced. One should remember, however, that the relationship between socioeconomic status and ethnic group membership does not indicate that ethnic group membership is responsible for lower intelligence scores among children. The fact that minority families often come from lower socioeconomic status in our society points to the power such a
status has on children's intellectual development. Finally, when samples investigated were broken down into different socioeconomic status groups, it was found that the fertility patterns associated with these socio-economic status groups, from high to low, can explain much of the decrease in children's intellectual development.

Parent-Child Relationships Theory

A third theoretical perspective is available for explaining the relationships among family size, birth order, and children's intellectual development. This perspective has been identified as the Parent-Child Relationships Theory proposed by Falbo and Polit (1986). On the basis of six meta-analytic studies focused on research related to only-children, they concluded that only- and first-born children as well as children from two-child families have a common type of relationship with their parents. This relationship, according to Falbo and Polit (1986), can be characterized as one consisting of heightened anxiety and attention to children among parents. Such heightened anxiety often results in parents' immediate attention to their children's behavior, which, in turn, results in greater closeness between them (Greenberg, 1967; Hoyt & Raven, 1973; see Falbo & Polit, 1986). It also encourages among children the development of an internal locus of control (Crandall et al., 1965; Falbo, 1981, 1984; MacDonald, 1971; see Falbo & Polit, 1986). However, in only- and two-child families, parents' limited experiences in parenting often leads them to develop higher expectations for their children and to become more deeply involved in their welfare and achievements (Clausen, 1966; Kammeyer, 1967; Waddle & Ball, 1980; see Falbo & Polit, 1986). Furthermore, the knowledge that parents of only-children have that they have only one child may lead them to establish and maintain much closer relationships with them.
On the other hand, parents of only-children and children in two-child families have more opportunities to interact with their children in close one-to-one interactions. Such interactions have been shown to enhance the intellectual skills and social behaviors of children (Falbo & Cooper, 1980; Gewitz & Gewitz, 1964; Hilton, 1967; Lewis & Feiring, 1982; see Falbo & Polit, 1986). In addition, in smaller families, in comparison to larger families, more financial resources may be available enabling children and their parents to participate in a variety of extracurricular activities together and to obtain better health care (Claudy, 1984; Howe & Madgett, 1975; Polit, 1984; see Falbo & Polit, 1986). Such parent-child experiences can certainly have an influence on children's intellectual development.

In 1986, Falbo and Polit (1986) conducted their first meta-analytic study of only-children, using 115 studies that met a stringent set of criteria, including such things as (a) similarity among the dependent variables studied, (b) overall quality of the investigation, (c) large and diverse samples, (d) a reasonable sample of only-children, (e) use of probability sampling techniques, (f) controls for extraneous variables, (g) application of appropriate and sophisticated statistical analysis, and (h) use of published measurement devices.

As some researchers assume, only children develop a lower intellectual level than children who have a younger sibling because they are deprived of the experience of tutoring a younger sibling. Findings in Falbo and Polit's (1986) study, however, revealed little support for such a hypothesis. In fact, they suggested an advantage among only-children in their intellectual development and achievement over children from larger families. Moreover, findings provided little support for what was called the "only-child uniqueness" hypothesis, suggesting differences in the intellectual levels of only-children from those who are first-born, and those who come from small families. No differences were found in the area of intellectual development and achievement of children in these
small families. What was found, however, was that children from these small family groupings had more positive parent-child relationships and higher intelligence and achievement scores. On the basis of these findings, therefore, Falbo and Polit (1986) concluded that it was the parent-child relationship rather than family size or birth order that brought about higher intelligence and achievement scores among children.

However, some have criticized Falbo and Polit's (1986) study. Mellor (1990) indicated that non-orthogonal t-tests to evaluate differences among the various comparison groups in the study should be replaced with independent comparison tests because of the multiple hypotheses involved.

More recently, Polit and Falbo (1988) conducted another meta-analytic study examining the intellectual achievement of only-children. More studies, specifically focused on intellectual achievement, were included in this investigation providing results similar to their earlier study just summarized (Falbo & Polit, 1986). Compelling evidence was found indicating that only-children had higher intellectual achievement scores than children from medium and large families. In addition, only-children, those who were first-born, and children from small families were similar in their intellectual achievement. Furthermore, children from smaller families had more positive parent-child relationships, again providing support for the parent-child relationships theory of intellectual development. At this point, it is important to mention that studies are available relating the variables of family size to parent-child relationships. Generally, findings indicate that increase in family size results in more authoritarian, rule-ridden characteristics on the part of parents, so that parent-child relationships can be described in terms of a "dominant-dominated" pattern (Blood, 1962, 1972; Kloepfer, Leonard, & Huang, 1981). Conversely, parent-child relationships in smaller families are often characterized by a greater degree of warmth, closeness, responsiveness, and supportiveness, which is what Polit and Falbo (1988) suggest is related to higher intellectual levels among children.
In addition to the meta-analytic studies of Falbo and Polit (1986, 1988), other studies are available suggesting that Parent-Child Relationships Theory be given serious consideration in future research. Marjoribanks and Walber (1975) theorized that the number of children in the family determines the amount of attention parents can provide to their children, and this amount of attention in turn determines the intellectual development of children. This idea was suggested by Cicirelli (1976) in a study of the relationships between children's intelligence and such variables as family size, birth order, child's gender, sibling's gender, and parental occupation. Decreases in the intellectual level of children were observed as family size increased. In addition, only-children did not do as well in their intellectual performance as children from two-child families. Most of the only-children in this sample came from single-child families, where the parent had only a limited amount of time to spend with children in comparison to two-parent families. Although these findings did not exactly mirror what Marjoribanks and Walber (1975) had predicted, they did indicate that family size was related to children's intelligence, indirectly suggesting that parental attention did play a role in children's intellectual performance.

In a study by Steelman and Doby (1983), investigating a large sample of white and African-American children, ages 6 to 11 years, findings revealed a negative relationship between number of siblings within the family and children's verbal IQ performance on the Weschler Vocabulary subtest. In addition, birth order was found to be unrelated to verbal IQ performance. They interpreted their findings as illustrative of the negative effects of number of children in the family on children's intellectual development due to the fact that, in larger families, parental attention and stimulation for each child was reduced. However, no measure of parental attention or stimulation was used.

In another study by Runco and Bahleda (1987), findings revealed that only-children had the highest divergent thinking test scores when compared to children from larger families. In interpreting such a finding, They indicated that only-children might
have developed personality traits that were important for the development of divergent thinking and contended that parental mediation experiences, i.e., "selecting and structuring the experiences of children" (p. 123), may have influenced only-children to become more divergent thinkers than children from other families. Again, however, measures of parental mediation were never used in this research study. The idea of parental mediation has also been reflected in other studies by Albert (1980) and Feuerstein (1980).

Studies are available that have scrutinized the relationship between parental involvement in children's lives and their educational success. In summarizing these studies, Snodgrass (1991) indicated that a positive home environment and strong parent-child relationships are critical determinants of children's educational success. The need to establish a supportive and positive home-school partnership for children, therefore, was emphasized. In a study by Bahr and Leigh (1978), using a sample of 1,000 males and females, ages 14 to 24 years, the relationships between subjects' intelligence and such variables as family size, and parental and teacher encouragement of continuing their education beyond the high school years were examined. Findings revealed that family size per se did not contribute significantly to children's intellectual performance, but parents' and teachers' educational encouragement was found to be the strongest and most significant predictor of subjects' intelligence.

In summary, some evidence in support of the Parent-Child Relationships Theory in explaining the association between children's intelligence and such variables as family size and birth order is present. The major studies related to this area (Falbo & Polit, 1986; Polit & Falbo, 1988), however, are meta-analytic ones. Only a limited number of studies are available that directly test the Parent-Child Relationships Theory (Mellor, 1990). Many more studies are available relating the variables of family size to children's intellectual development, then interpreting their findings on the basis of Parent-Child Relationships Theory. While these latter group of studies are interesting, they suggest a
need for more investigation in which the actual parent-child relationship variables, along with intelligence, family size, and birth order are investigated.

**Part II: Theoretical Framework of the Study**

In Part I of this literature review, three theoretical frameworks were presented, along with related research, linking the variables of family size, birth order, and children's intellectual development. Confluence Theory (Zajonc & Markus, 1975) identified the variables of family size and birth order as contributing significantly to children's intellectual performance. Although useful in explaining the above relationship when aggregate data were analyzed, this theory did not fare well when individual data were analyzed. Furthermore, results predicted on the basis of this theory were not fully consistent from study to study.

On the other hand, Admixture Theory posited the importance of socioeconomic status and ethnic group membership in predicting children's intellectual development. While the relationship between socioeconomic status and ethnic membership is an important one, being from a particular ethnic group does not in and of itself ensure that a child's intellectual level would be affected deleteriously. The fact that individuals from ethnic minority groups are often found among the poor, suggest that this relationship would occur. As a result, it appears that socioeconomic status rather than ethnic group membership is the variable that contributes most specifically to children's intellectual performance. A number of studies were found to support the relationship between socioeconomic status and children's intellectual development. However, further examination of these investigations revealed that many of them have failed to rule out
other possible variables, except for admixture variables (i.e., family size, birth order, and socioeconomic status) in mediating their effect on children's intellectual development.

Unlike both Confluence and Admixture Theories, Parent-Child Relationships Theory proposed that it is the quality of the relationship between parents and their children that contributed most significantly to children's intellectual development. Only a very limited number of studies were found in this area, although such a theory was developed on the basis of two meta-analytic investigations of a large number of studies that included the variables of family size, birth order, parent-child relationships, and children's intellectual performance. Although criteria were established for quality control of studies included in the meta-analytic studies, whether findings obtained do in fact occur when studies are conducted directly to test such a theory is conjecture at this point. Nonetheless, it seems reasonable to assume at this time that supportive, warm, and caring relationships between parents and their children would likely facilitate intellectual development among their children, whatever children's family size and birth order. Further research is needed in this area.

It should also be indicated that while the variables identified above by the three theories have been shown to be related to children's intellectual performance, studies are also available that relate each of these variables with each other. As previously reviewed in Part I of this literature review, socioeconomic status has been found to be negatively related to family size. Likewise, family size has been found to be negatively related to positive relationships between parents and children.

The fact that these three theories have existed alongside of each other for a number of years and that the variables included within each theory have been found to be interrelated, makes it surprising that no one has attempted to conduct a study combining variables from each of these theories into a comprehensive study about how they together might contribute to the intellectual development of children. Such a multivariate approach
would provide a more comprehensive and realistic picture about how such variables might together enhance or impede the development of children's intelligence. Separating these variables from one another for investigation appears oversimplistic, since we know that each of these variables is related to each other and also to children's intellectual development.

The primary purpose of this study, therefore, is to combine variables found within the three theories of children's intellectual development just summarized, and to explore how each of these variables might contribute to children's intellectual development. These factors include the variables of family size, birth order, socioeconomic status, and parent-child relationships.
METHODS

Subjects

Subjects for this study consisted of 74 children and their parents (mothers and fathers), self-selected from nine preschool programs and daycare centers in Corvallis, Oregon. All the 74 families were intact families, with biological mothers and fathers. Among these were 63 white and 11 non-white (mainly international Asian) families. The age range of the child subjects was 3 years-2 months to 6 years, with a mean age of 4 years-8 months (see Table 1). Among the child subjects, there were 39 boys and 35 girls. The age range for the boys was 4 years-1 month to 6 years, with a mean age of 4 years-9 months. The age range of the girls was 3 years-3 months to 5 years-11 months, with a mean age of 4 years-7 months. There was no significant difference between boys and girls in their performance on the Peabody Picture Vocabulary Test, $F(1, 72) = 0.62, p > .05$.

Table 1. Description of Subjects by Sex and Age (N = 74)

<table>
<thead>
<tr>
<th>Sex</th>
<th>n</th>
<th>Age Range (years/months)</th>
<th>Mean Age (years/months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>39</td>
<td>4/1 - 6/0</td>
<td>4/9</td>
</tr>
<tr>
<td>Girls</td>
<td>35</td>
<td>3/3 - 5/1</td>
<td>4/7</td>
</tr>
<tr>
<td>Total</td>
<td>74</td>
<td>3/3 - 6/0</td>
<td>4/8</td>
</tr>
</tbody>
</table>
Instruments

Several instruments were used to measure the variables in this study. These variables included family size, birth order, family socioeconomic status, aspects of parent-child relationships, and children's intellectual level.

Family Size and Birth Order of Child.

Information on the family size and birth order of each subject was obtained from a Demographic Questionnaire (see Appendix A) completed by parents as well as from program directors. On the basis of this information, the variables of family size (number of children in the family) and birth order of the child were determined. In this study, the earlier the birth, the higher the birth order number. Since only one- to three-child families were used in this study, first-born children were assigned the number 3, second-born children the number 2, and the third-born children the number 1. The variable of family size represented the actual number of children within the family.

In addition to information on family size, birth order, and socioeconomic status of the families from which the child subjects in this study came, the Demographic Questionnaire also asked parents (fathers and mothers separately) to provide the researchers with information about their age, marital status, and ethnic background.

Family's Socioeconomic Status.
The socioeconomic status of families of children used as subjects in this study were assessed with the Four Factor Index of Social Status (FFISS; Hollingshead, 1975).

The FFISS (Hollingshead, 1975) is a widely used scale that assesses the socioeconomic status of a family through use of information regarding parents' education, occupation, marital status, and sex. The assumptions made here include (a) a status structure is present in our society, (b) occupation and education, along with sex and marital status are indicative of social status, and (c) these factors in combination can provide a reliable and meaningful estimation of the status positions of families in society.

In order to estimate a family's socioeconomic status, scaled scores ranging from 1-7 are given to varying levels of education, and scaled scores ranging from 1-9 are given for different occupations. Adjustments are made on the basis of marital status of the family head or heads, and their relationship(s) to the labor force. The score for education is multiplied by a weight of 3, while the score for occupation is multiplied by a weight of 5. These scores are then summed creating a possible range of scores from 8 to 66. These can then be organized into five socioeconomic classes including:

<table>
<thead>
<tr>
<th>Class</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (upper)</td>
<td>66-55</td>
</tr>
<tr>
<td>II (upper-middle)</td>
<td>54-40</td>
</tr>
<tr>
<td>III (middle)</td>
<td>39-30</td>
</tr>
<tr>
<td>IV (middle-lower)</td>
<td>29-20</td>
</tr>
<tr>
<td>V (lower)</td>
<td>19-8</td>
</tr>
</tbody>
</table>

In this study, raw scores of socioeconomic status were employed in data analyses.

As previously indicated, the FFISS was used to estimate a family's socioeconomic status in two ways. First, parents were asked to complete the FFISS relative to their present occupational and educational levels. However, since parents in this study also included a few college students who had neither completed their education nor established their professional careers, a proxy of socioeconomic status was used for those families on
the basis of occupational and educational levels of the children's grandparents. This is because parents' socioeconomic status is likely to influence their children's socioeconomic status when their children establish their own families (although it is not always the case that parents of higher socioeconomic status will have adult children of higher socioeconomic status). All information relative to estimating the socioeconomic status of families of the child subjects used in this study was obtained via a Demographic Questionnaire (see Appendix A).

The FFISS has been used in numerous studies to assess the social status of families for control or analysis purposes. A very high correlation has been obtained for the relationship between the FFISS and the NORC Prestige Scale scores ($r = .927$).

**Parent-Child Relationships.**

The Parent Attitude Research Instrument-Short Form (PARI-SF; Cross & Kawash, 1968) was used to assess aspects of parent-child relationships within the families of the child subjects in this study (see Appendix B). Both fathers and mothers were asked to complete the scale separately.

The PARI-SF consists of 45 items assessing two major factors including parental authoritarianism and warmth. Specific areas in which test items were developed include equalitarian, deification, irritability, encouraging verbalization, excluding outside influences, and their reverse. In completing the scale, parents are asked to rate each item found in the PARI-SF, using a 4-point scale from strongly agree to strongly disagree. For warmth factor items, strongly agree represented 4 points, while strongly disagree represented 1 point. However, for authoritarian factor items, scoring is reversed. Scores
from both factors are then summed creating a non-authoritarian/warmth score, representing the variable of parents' support.

The PARI-SF has been developed from the original PARI created by Schaefer and Bell (1958) to assess aspects of parent-child relationships within a family. Internal consistency reliability estimates have ranged from .40 to .46 for Equalitarian, .55 to .69 for Deification, .54 to .63 for Irritability, .34 to .45 for Encouraging Verbalization, and .63 to .74 for Excluding Outside Influence. Test-retest reliability coefficients have been estimated to be .75 for Deification, .79 for Irritability, .72 for Excluding Outside Influence, and .44 for Encouraging Verbalization. In addition, a number of content and concurrent validity studies have been summarized in the literature (Schaefer & Bell, 1958).

In developing the PARI-SF, Cross and Kawash (1968) did a factor analysis and found that 50% of the total variance was accounted for by two factors: authoritarianism and warmth. In addition, their validation study showed that the PARI-SF was significantly correlated with other established scales such as the Social Science Research Council Scales of Authoritarianism (SSRC; Stern, Sanford, Lane, Webster, & Christie, 1960).

Children's Intellectual Level.

The Peabody Picture Vocabulary Test (PPVT-R; Dunn & Dunn, 1981) was used to measure the child subjects' intellectual level. The PPVT-R (Dunn & Dunn, 1981) is an individually administered, norm-referenced test that measures children's receptive language ability, from which their intelligence scores are derived. It consists of 350 items or pictures organized into groups of four pictures each, from which a child is asked to select the picture that best depicts the word the researcher asks. The test has been developed for application to a wide range of subjects from 2 years-6 months to 40 years.
In order to obtain an individual's receptive language ability score, the critical range testing technique is used. This technique involves the establishment of a lower limit and an upper limit item for each individual taking the test. The lower limit item is called the basal item, and is established by finding the highest eight consecutive responses an individual has correct on the test. The upper limit item is called the ceiling item, and is established by finding the eight consecutive responses in which six errors occur. All items below the basal item are counted as correct, while those above the ceiling item are counted as incorrect. The total receptive language ability raw score is calculated by subtracting the number of errors that occur between the basal and ceiling item (critical range) from the number of the ceiling item in the test. This raw score is then converted into standard IQ scores from conversion tables provided in the test manual (Dunn & Dunn, 1981).

Internal consistency estimates for the PPVT-R have ranged from .61 to .88 and .71 to .91 for alternate forms of the test. In addition, alternate form reliability estimates have ranged from .66 to .89 for standard IQ scores, and .79 to .86 for raw scores. Test-retest reliability estimates have ranged from .54 to .90 for standard IQ scores, and .66 to .89 for raw scores (Mccallum, 1985).

Evidence of validity for the PPVT-R has also been documented in the literature. Content validity for the test has been established through the selection of word items based on cross-referencing items with age/grade-level referenced vocabulary lists. Construct validity has been established through data on the gradual increase over age in the percentage of correct responses made by subjects to items in the PPVT-R. Furthermore, concurrent validity estimates have been established in studies that correlate subject's PPVT-R scores with those of the WISC-R, yielding coefficients ranging from .58 to .83 (Haddad, 1986; Naglieri, 1982; Rosso, Falasco, & Phelps, 1984).
Procedures

Collection of Parent-Child Relationship Information

Parents of children enrolled in nine preschool and child care programs in Corvallis, Oregon were contacted via a letter soliciting their participation and that of their child in this research study. A total of 230 of these letters were sent to parents. In this letter, (a) an explanation of the purpose of the study was made, (b) information about what participation in this research project meant was presented, (c) assurance of confidentiality all information obtained from them was guaranteed, and (d) their rights to withdraw from the research project at anytime without any negative repercussions were assured. In order to assure confidentiality and anonymity of all parents and children in this study, a separate number was assigned to families, with different letters to distinguish between each parent and the child.

In addition to the letter, parents were sent (a) a permission form requiring their signatures, authorizing themselves and their children to participate in the research project, (b) two copies of the PARI-SF and Demographic Questionnaire, one for each parent to complete, and (c) separate self-addressed envelopes for each parent to return their completed questionnaires. Each parent was asked to complete the PARI-SF and Demographic Questionnaire separately, without comparing their answers. Of the 230 of questionnaires sent, 74 pairs of parents (mothers and fathers) returned their questionnaires for a 31% response rate. All data collection procedures associated with parents and children in this study were approved by the Committee for the Protection of Human Subjects at Oregon State University.
Collection of Data on the Peabody Picture Vocabulary Test-Revised

Examiners: Five examiners were used to collect data on children's intellectual level (IQ) with the PPVT. Four of these examiners were undergraduate students in the Department of Human Development and Family Sciences at Oregon State University enrolled in a research course, HDFS 401. The remaining examiner was the researcher of this study. All undergraduate student examiners received training in administering the PPVT to preschool children before they administered the actual test to children in this study.

Establishment of Rapport: In order to obtain cooperation of the child subjects and insure reliable results, all examiners spent about a week interacting with the child subjects in their classrooms as visitors, prior to data collection.

Data Collection: Collection of data with the PPVT occurred from late May to the middle of June, 1993. Five examiners participated in collecting data from the subjects. Each examiner tested only a small portion of the child subjects in this study. To facilitate children's involvement in the test situation, each child was approached individually by his/her classroom teacher and the examiner for participation in testing during the self-selected activity time segment of the preschool day. The teacher reintroduced the examiner to the child, told the child that the examiner had brought something to share, and asked if the child would like to join the examiner at that time. Simultaneously, the examiner approached the child, showing the child a picture book that was to be used in the test situation, inviting the child in a friendly manner to come along. If the child was unwilling to participate, the examiner assured the child that it was fine not to participate and that he/she could do so later if he/she wished to participate. Only two children who were approached refused to participate.
**Testing Area:** A relatively quiet area in the child's classroom was used to administer the test. Books, toys, materials, and equipment were removed from the testing area to avoid distractions. The child and the examiner were seated at a child-sized table on which the testing material was laid in front of them.

**Administering the Test:** The examiner first explained to the child what they would be doing and had the child practice the procedures to be followed in the test situation using a few words and pictures. The examiner then read the test words found in the PPVT, beginning with the age-appropriate starting word, asking the child to point to the picture which he/she thought the word corresponded to. This process continued until base and ceiling words were identified, and the test was terminated.
RESULTS

The purpose of this study was to examine the relative contributions of family size, birth order, socioeconomic status, and quality of parent-child relationships to young children's intellectual development. Subjects for this study included 74 children (39 boys and 35 girls), ages three to six years of age, attending one of nine preschool and day care programs in Corvallis, Oregon, and their biological parents (mothers and fathers).

These families were predominantly from the upper-middle and upper socioeconomic classes (95%) as defined by FFISS, and were of Caucasian decent (85%). However, since a number of children in this sample (n=11) were from different ethnic groups (mainly Asian), and since ethnic membership is a variable in Admixture Theory, the variable of ethnicity was also considered in the final data analyses. Preliminary data analysis using regression procedure revealed that children's gender did not make a significant contribution to children's intellectual development, therefore, this variable was dropped from further analyses.

Information on the predictor variables of ethnicity, family size, birth order, and socioeconomic status was obtained from a Demographic Questionnaire administered to parents. Hollingshead's (1975) Four Factor Index of Social Status was used to calculate each family's socioeconomic status. In addition, the Parent Attitude Research Instrument - Short Form (PARI-SF, Cross & Kawash, 1968) was used to assess the quality of parent-child relationships (for mothers and fathers separately). The mean-split was used to dichotomize the quality of parent-child relationships scores into high and low groups for data analyses. Information on the criterion variable of children's intellectual level was obtained using the Peabody Picture Vocabulary Test-Revised.
Data Analyses and Results

A number of statistical procedure were applied to the data for analyses.

Descriptive Statistics

Table 2 summarizes the means, standard deviations, and range of all predictor and criterion variables included for analyses in this study. The predictor variables included family size, birth order, socioeconomic status, and quality of parent-child relationship (scores for mothers and fathers separately). Ethnicity was also included as a predictor variable in the final analysis, since a small portion of the sample (15%) was not of Caucasian descent. The criterion variable for this study included children's intellectual levels (PPVT scores).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predictor Variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Size</td>
<td>2.08</td>
<td>0.72</td>
<td>1-3</td>
</tr>
<tr>
<td>Birth Order</td>
<td>2.32</td>
<td>0.72</td>
<td>1-3</td>
</tr>
<tr>
<td>Socioeconomic Status</td>
<td>56.47</td>
<td>9.47</td>
<td>23-66</td>
</tr>
<tr>
<td>Mother-Child Relationship</td>
<td>130.86</td>
<td>10.57</td>
<td>87-155</td>
</tr>
<tr>
<td>Father-Child Relationship</td>
<td>129.44</td>
<td>15.59</td>
<td>74-157</td>
</tr>
<tr>
<td>Criterion Variable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intellectual Level</td>
<td>109.96</td>
<td>17.49</td>
<td>64-158</td>
</tr>
</tbody>
</table>

Correlation Coefficients
Table 3 summarizes the correlation coefficients calculated expressing the relationships between all predictor and criterion variables used in this study. Results revealed that children's intellectual level was significantly and negatively related to family size ($r = -0.30$, $p < .01$), but significantly and positively related to birth order ($r = 0.26$, $p < .05$), socioeconomic status ($r = 0.40$, $p < .001$), and quality of father-child relationship ($r = 0.37$, $p < .001$).

Table 3. Correlation Coefficients Expressing the Relationship Between Intellectual Level (IL), Ethnicity (ETH), Family Size (FS), Birth Order (BO), Socioeconomic Status (SES), Mother-Child Relationships (MP), and Father-Child Relationships (FP) (N=74)

<table>
<thead>
<tr>
<th>Variable</th>
<th>IL</th>
<th>ETH</th>
<th>FS</th>
<th>BO</th>
<th>SES</th>
<th>MP</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. IL</td>
<td>1.00</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2. ETH</td>
<td>-0.20</td>
<td>1.00</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>3. FS</td>
<td>-0.30**</td>
<td>-0.05</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. BO</td>
<td>0.26*</td>
<td>0.18</td>
<td>-0.69****</td>
<td>1.00</td>
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<td></td>
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<td>5. SES</td>
<td>0.40***</td>
<td>-0.14</td>
<td>-0.13</td>
<td>0.02</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. MP</td>
<td>0.16</td>
<td>-0.10</td>
<td>-0.17</td>
<td>0.01</td>
<td>0.28*</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>7. FP</td>
<td>0.37***</td>
<td>-0.16</td>
<td>-0.17</td>
<td>0.10</td>
<td>0.24*</td>
<td>0.26*</td>
<td>1.00</td>
</tr>
</tbody>
</table>

* $p < .05$. ** $p < .01$. *** $p < .001$.

In addition, birth order was significantly and negatively related to family size ($r = -0.69$, $p < .0001$), and socioeconomic status was significantly and positively related to quality of mother-child ($r = 0.28$, $p < .05$) and father-child ($r = 0.24$, $p < .05$) relationships. Finally, the quality of mother-child and father-child relationship was significantly and positively related to each other ($r = 0.26$, $p < .05$).

Apparently, the quality of mother-child and father-child relationship found within each family in this study was positively related to each other. In addition, the variable of socioeconomic status, derived from parents' education and occupation scores, suggested that a combination of more education and a higher occupational status was positively
related to mother-child and father-child relationships (i.e. support, involving warmth and non-authoritarianism) scores. The negative relationship between birth order and family size is reasonable, suggesting that subjects with lower birth orders would likely come from larger families. Finally, among the predictor variables identified in the review of theoretical and research literature regarding children's intellectual development, family size, birth order, socioeconomic status, and father-child relationship were found to be significantly related to children's intellectual development, while ethnicity and mother-child relationship were not. Further analyses of data, using regression techniques, helped to decipher the relative contributions of these variables to children's intellectual development.

Regression: Predictors of Children's Intellectual Levels

Regression analysis was applied to the data to determine the relative contributions of the predictor variables on children's intellectual level. The predictor variables included ethnicity, family size, birth order, socioeconomic status, and quality of mother-child, and father-child relationship. The \( p < .05 \) was used as the criterion for statistical significance.

Table 4 summarizes the results of the regression analysis. The overall model was significant \( (R^2 = .33, p < .0001) \). However, of the variables included in the model, only the family socioeconomic status \( (t = 2.94, p < .01) \) and quality of father-child relationships \( (t = 2.24, p < .05) \) contributed significantly and positively to children's intellectual development scores.
Table 4. Results of the Regression Predicting Children's Intellectual Level Scores (N=74)

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>SD</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>75.45</td>
<td>19.34</td>
<td>3.9  **</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>-8.63</td>
<td>5.10</td>
<td>-1.69</td>
</tr>
<tr>
<td>Family Size</td>
<td>-2.43</td>
<td>3.48</td>
<td>-0.70</td>
</tr>
<tr>
<td>Birth Order</td>
<td>4.6</td>
<td>3.43</td>
<td>1.34</td>
</tr>
<tr>
<td>Socioeconomic Status</td>
<td>0.58</td>
<td>0.20</td>
<td>2.94 **</td>
</tr>
<tr>
<td>Mother-Child Relations</td>
<td>-1.00</td>
<td>3.79</td>
<td>-0.26</td>
</tr>
<tr>
<td>Father-Child Relations</td>
<td>8.37</td>
<td>3.75</td>
<td>2.24 *</td>
</tr>
</tbody>
</table>

R² = .33, * p < .05. ** p < .01. *** p < .001.

The amount of variance explained by the entire model was 33%. Socioeconomic status accounted for 16% of the variance while father-child relationships accounted for 8% of the variance. This indicated that the higher the socioeconomic status of the family, the higher the intellectual development scores of children. Furthermore, the more supportive (i.e., warm/non-authoritarian) the fathers' attitude toward the child, the higher the child's intellectual level.

Exploratory Analyses

In addition to the regression analyses, three additional exploratory analyses were undertaken relative to the variables of parent-child relationship, intellectual development, and being an only child in the family.

Parent-Child Relationships.

With respect to the quality of parent-child relationship scores, since families in the present study consisted of biologically intact families, separating mothers' and fathers' scores to understand their contributions to children's intellectual development may be unrealistic, as both parents and children interact within these families. These interactions may result in differences in the intellectual performance of their children.
In an attempt at exploring how such interactions might influence children's intellectual development scores, an analysis of variance procedure was applied to the data to compare intellectual scores of children from various mother-father parent-child relationship combinations. These combinations included mothers and fathers who showed high support, mothers who showed low support and fathers who showed high support, mothers with high support and fathers with low support, and both mothers and fathers with low support. Results in Table 5 revealed a significant difference between the groups studied, $F(3, 70) = 3.84$, $p < .05$. Post hoc comparisons of the means, using the LSD procedure, revealed this difference only to be between the high mother/high father support group and the low mother/low father group ($p < .05$) as well as the high mother/low father

<table>
<thead>
<tr>
<th>Table 5. Comparisons of the Intellectual Level Scores of Children in Various Parent-Child Relationship Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Table Image" /></td>
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</tbody>
</table>

* $p < .05$. 
shown in the regression analysis, exerted a stronger influence on children's intellectual development than mothers', as shown in Table 5, mothers' parent-child relationship scores do exert some influence on children's intellectual development.

**Intellectual Development of Only Children.**

In reference to understanding the intellectual development of only children, two additional analyses were undertaken with the data. Although birth order and family size were not found to contribute significantly to children's intellectual development, the manner in which these variables were analyzed did not provide the present researcher with more specific knowledge of the intellectual development of only children. Because of this, and because of the fact that the present researcher's interest in this study was first generated by a concern about only children, a regression analysis was applied to the data, using only children as a base, comparing only children with other children who were first-born from two-child families, second-born in two-child families, first-born in three-child families, second-born in three-child families, and third-born in three-child families. Findings, summarized in Table 6, revealed that only children had significantly higher intellectual scores than second-born children in two-child families, and third-born children in three-child families. No other significant differences were found.
Table 6 Results of the Regression Comparing the Intellectual Level Scores of Only Children with Those of Other Children

<table>
<thead>
<tr>
<th>Groups</th>
<th>n</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-born from two-child families</td>
<td>16</td>
<td>-8.39</td>
</tr>
<tr>
<td>Second-born from two-child families</td>
<td>20</td>
<td>-14.36  **</td>
</tr>
<tr>
<td>First-born from three-child families</td>
<td>3</td>
<td>-15.19</td>
</tr>
<tr>
<td>Second-born from three-child families</td>
<td>8</td>
<td>-2.76</td>
</tr>
<tr>
<td>Third-born from three-child families</td>
<td>11</td>
<td>-17.61  **</td>
</tr>
</tbody>
</table>

*p < .05. **p < .01.

Only Children and Father-Child Relationships.

Finally, as a result of the present researcher's interest in only children and as a result of the present significant findings associated with the importance of the quality of father-child relationships in children's intellectual development obtained via the regression analyses, the relationship between these two variables was further explored. Application of an analysis of variance comparing the father-child relationship scores of only children, and the scores of fathers of children from multiple-child families, revealed that the father-child relationship scores of only children (M=0.55) tended to be higher (more supportive: warm/non-authoritarian) than fathers of other children (M=0.49), F (1, 72) = 3.22, p < .08.
DISCUSSION

This study examined the relative contributions of family size, birth order, socioeconomic status, and quality of parent-child relationships to the intellectual development of children three to six years of age. These variables were selected for study because past theoretical perspectives have identified them as important in understanding children's intellectual development. However, none of these theoretical perspectives have attempted to understand how a combination of these variables might further our understanding of their impact on children's intellectual development. For example, Confluence Theory (Zajonc & Markus, 1975) posited that family size and birth order were crucial determinants of children's intellectual development, while Admixture Theory (Page & Grandon, 1979) focused on such demographic characteristics as a family's socioeconomic status. The Parent-Child Relationships Theory of Falbo and Polit (1986), however, emphasized the significance of the quality of parent-child relationships in facilitating the intellectual development of children. Therefore, in this study, an attempt was made to examine the relative contributions of all these variables together in understanding children's intellectual development, using a regression procedure.

Findings

A number of significant findings were obtained that could be related to past theoretical and research literature in the field. First, family size and birth order were not significant predictors of young children's intellectual development scores in this study. Thus, propositions derived on the basis of Confluence Theory (Zajonc & Markus, 1975) could not be supported. While the significant correlation coefficients expressing the
relationship between family size and children's intellectual development and between birth order and children's intellectual development were in the direction predicted on the basis of Confluence Theory, introduction of such variables in the regression model indicated that they made no significant contributions to children's intelligence scores. Such finding, in addition to those found in an exploratory analysis of the data relative to only children, provides further doubt about the efficacy of Confluence Theory in explaining children's intellectual development. Contrary to propositions predicted on the basis of Confluence Theory, only children did not have lower intellectual development scores than other family size/birth order groups, but had higher intellectual development scores than some groups, and were no different from other groups. Findings, of the present study, therefore, coincide with an growing body of research that have not provided support for the Confluence Theory of intellectual development among young children (e.g., Brackbill & Nichols, 1982; Galbraith, 1982a, 1982b; Grotevant et al., 1977; Page & Grandon, 1979; Pulvino & Lupton, 1978; Svanum & Bringle, 1980).

Second, socioeconomic status was a significant predictor of children's intellectual development scores. The significance of this finding was magnified in light of the fact that this finding was obtained with a sample that was highly homogenous in nature. Children included in this study came predominantly from upper-middle and upper socioeconomic classes. Proposition derived from Admixture Theory (Page & Grandon, 1979) about the importance of socioeconomic status in contributing to the intellectual development of young children is, therefore, supported. In the present study, socioeconomic status was assessed via parental education and occupation. Perhaps, it may be argued that parents with higher educational levels are more likely to provide their children with a variety of educational experiences that would enhance their children's intellectual development. In addition, parents whose occupational status are relatively high, are likely to have more resources to access experiences that would enhance their children's intellectual
development (Claudy, 1984; Howe & Madgett, 1975; Polit, 1984; Falbo & Polit, 1986).
However, caution must be made relative to interpretation of these findings, since 95% of
the present sample came from upper- and upper-middle socioeconomic class families.
Generalization of these findings to the whole range of socioeconomic classes, therefore, is
not possible at this time.

Finally, the quality of the father-child relationship rather than the mother-child
relationship was a significant positive predictor of children's intellectual development
scores. This means that fathers who are more supportive (warm and non-authoritarian) of
their children are likely to have a significant positive impact on their children's intellectual
development. The proposition derived on the basis of Falbo and Polit's (1986) Parent-
Child Relationships Theory, therefore, is partially supported, primarily with respect to
fathers. The fact that the quality of the mother-child relationship did not significantly
predict their children's intellectual development scores, however, should not be seen as an
indication that mothers are not involved in the development of children's intelligence. The
fact that the correlation coefficient expressing the relationship between mothers' and
fathers' parent-child relationship scores was significant and positive and that the results of
the analysis of variance indicating that families where fathers and mothers were high in
parental support (warm/non-authoritarian) had children with higher intellectual
development scores than children in families where fathers and mothers were low in
parental support suggests that mothers do play a role in children's intellectual
development. However, the significant contribution of the father-child relationship scores
to children's intellectual development scores obtained via the regression analysis, and the
finding that children with fathers with high support (warm/non-authoritarian) scores had
higher intellectual development scores than children with fathers with lower support
scores, suggest the fathers' role in contributing to children's intellectual development may
be stronger than that of mothers. The involvement of fathers in children's lives is
magnified in the finding associated with the tendency of higher father support (warm/non-authoritarian) scores among only children in comparison to children from other family size/birth order groups found in this study, although in this analysis mothers' support scores were not analyzed. Perhaps, these findings reflect the differential role mothers and fathers play in raising children today. There are studies which show that mothers are more involved in the caretaking tasks of nurturing children, while fathers are more involved with children in leisure activities and outdoor tasks (e.g., Baxter, 1988). Interaction with children in leisure activities and outdoor tasks are likely to involve more of children's cognitive skills than nurturing activities, therefore, the finding relative to the relationship between father-child relationships and children's intellectual development was found in this study.

In conclusion, apparently the variables of birth order and family size were not very significant predictors of children's intellectual development. Socioeconomic status and the father-child relationship were very significant and positive predictors of children's intellectual development. Confluence Theory was not supported by the results of this study, while the Admixture Theory and Parent-Child Relationships theories of intellectual development appeared to be strongly or partially supported. It appears, therefore, that in examining the development of children's intellectual abilities, a multivariate perspective rather than a univariate one may be more useful.

Limitation of the Study

In this study, while efforts were made to examine children's intellectual development from a multivariate perspective, including a variety of variables identified in past theory and research, problems still existed that may have markedly influenced the
results obtained. Some of these problems are associated with the instruments used, the sample obtained, methodology employed, and other confounding variables.

Instruments

The Peabody Picture Vocabulary Test is a measure to assess a child's receptive language skills from which their intellectual development scores are derived. As such, it constitutes only a small part of a child's total intellectual abilities. Relationships found between intellectual development and other variables examined in this study, therefore, may not provide one with a very thorough picture of these relationships. In addition, the Parent Attitude Research Instrument-Short Form may be limited in its abilities to assess current parent-child relationship dimensions. The instrument was developed several decades ago, when parent attitudes may have been very different from those of parents today. Indeed, in completing the questionnaire, several parents pointed out that the items included in the questionnaire were worded awkwardly, not applicable to situations today, and asked for answers that were very obvious.

Furthermore, it is very likely that the Peabody Picture Vocabulary Test-Revised and the Parent Attitude Research Instrument-Short Form were biased against the international Asian subjects in the study. The non-significant results associated with the variable of ethnicity obtained, therefore, may have been due to this limitation. Future studies using intelligence and parent attitudes research instruments from these cultures may provide researchers with significantly different findings.

Moreover, assessing socioeconomic status via FFISS may have not been sufficient. FFISS is a measure of a family's social position in society rather than a measure of a family's actual socioeconomic status. Although, in some instances, a family's socioeconomic status may be indicated by parents' occupation and education, this may not
always be the case. For example, a person in a less prestigious occupation may earn more than a person in a more prestigious occupation. Likewise, a person with a higher education level may earn less than a person with a lower education level. Perhaps, a measure of the actual family income to assess the variable of socioeconomic status in future studies would be worthwhile.

Methodology

Using grandparents' socioeconomic status as a proxy for a family's socioeconomic status may have influenced the results obtained in this study, although the decision to use this measure was based on the fact that a portion of the present relatively small sample (15%) was students with no established occupation or education. Eliminating these subjects from the study would have limited the sample considerably for any meaningful investigation. In addition, using questionnaires as a means of assessing the quality of parent-child relationships may not have been very effective. Since parents in the present study were predominantly from the upper-middle and upper socioeconomic classes, they were individuals who represented some of the most highly educated persons in our society. Such parents are often knowledgeable about tests like the one administered to them. They may have answered the questions asked of them on the basis of what was "expected" rather than giving an accurate account of their relationships. Furthermore, although attempts were made to ask parents to complete the questionnaires separately, there was no way to control for whether sharing or talking did occur among parents when completing their questionnaires at home.

Another problem encountered relative to methodology that stood out in this study was the use of a large number of examiners (five) to gather the intelligence data from a relatively small sample of children. Although, each examiner was trained to administer the
PPVT with a small portion of the sample, there was no attempt made to obtain reliability information on the examiners. Variability in the intelligence scores of children, therefore, may have been due to reliability problems rather than assessing "true" differences.

Sample

There were also some problems encountered relative to the sample. Considering the large number of variables that were used in data analyses, the sample size was much too small. As a result, problems associated with generalizing findings to a larger population may have occurred. For example, although mother-child relationship was not found to be a significant factor in children's intellectual development in this study, with a large enough sample, mothers' contribution may have stood out. In addition, the variable of ethnicity may have been significant if more Asian subjects were included in this study. The lack of generalizability was further intensified by the fact that parents used in this study were predominantly from upper-middle and upper socioeconomic classes as well as by the fact that non-probability sampling procedures were used in obtaining the subjects. Subjects were essentially self-selected, with a very low response rate of 31%. As a result, the sample was highly unrepresentative, preventing generalization of findings to the larger population. Therefore, caution must be made in interpreting and drawing implications from the results obtained.

Confounding Variables

Examination of the results obtained from the data analysis revealed that the regression model, while significant, left a large portion of variance in the scores
unexplained by the variables included in the model. This suggests that other possible important variables need to be studied if a more accurate understanding of children's intellectual development is to be obtained. In studying the data, several other questions could be asked. For example, "Do children of different birth orders and family backgrounds behave differently in their preschool and day care centers?" Answer to such a question might help us to decipher whether children's experiences in their preschool environment were exerting an influence on their intellectual development scores. Furthermore, questions related to children's temperament and parent-child relationships may add further to our understanding of children's intellectual development. In addition, exploring more precisely how children's family environment exerts an influence on their intellectual development would be worthwhile. Moreover, although in the preliminary analyses of data gender did not contribute significantly to children's intellectual development, the interaction between the gender of child and parent may have. Mother-daughter relationships may differ significantly from mother-son relationships, father-daughter relationships may differ significantly from father-son relationships, mother-daughter relationships may differ significantly from father-daughter relationships, and mother-son relationships may differ significantly from father-son relationships. Our sample was much too small to meaningfully undertake such comparisons. These are some of the many confounding variables that were not included or controlled for in this study.

**Suggestions for Future Study**

On the basis of this study, there are a number of areas in which future research might be conducted. First, assessing children's intellectual development from a
multidimensional perspective would appear worthwhile. Receptive language skill is only one aspect of a child's intelligence. "Skills in numerical computation, perceptual speed and accuracy, associative memory, spatial visualization, and mechanical reasoning" are also important aspects of intelligence (Bahr & Johnston, 1993, pp. 92). In addition, a culture-free instrument to measure intellectual ability will improve the validity of this study, if non-white subjects are included in the sample.

Second, an income index could be included in assessing socioeconomic status of the family, along with the measure of social position, which consists of the education and occupation components.

Third, using a larger sample, covering a broader socioeconomic base, and including children from more varied family sizes would be worthwhile in verifying the results obtained in this study. Furthermore, if non-white subjects are used at all, a larger number of such subjects should be employed. Findings from such larger samples can aid the researcher in generalizing the results obtained to a much larger population.

Fourth, using observation techniques to record parent-child interactions within the child's home would be an appropriate means of gaining a more accurate account of the relationships between parents and children. These observations could consist of spontaneous interactions between parents and children, providing the researcher with more realistic information about the relationships between parents and children.

Finally, assessment of other important variables such as the family's cognitive environment, children's temperament, and teacher-child interactions could be obtained to understand how these variables might contribute to children's intellectual development. In addition, analyses of data to uncover whether interaction between gender of child and parent, the relationships between them, and their contribution to children's intellectual development would be important.


Hollingshead, A. B. (1975). Four factor index of social status. Department of Sociology, Yale University, P. O. Box 1965, New Haven, Conn.


Appendix A

Letter to Parent

Dear Parents:

We are presently conducting a research project focused on how parent-child relationships contribute to the intellectual development of children. In order to successfully complete this project, we are looking for parents (mothers and fathers) and their preschool children who are interested in participating as subjects in this research project.

Participating in this project will simply involve both mothers and fathers filling out separate Parent-Child Relationship Questionnaires that are enclosed with this letter. Completion of these questionnaires will take about 15 minutes of your time. In addition, your preschool child will be individually asked to (a) draw a person on a sheet of paper, and (b) identify the meaning of a number of words that are depicted in a set of pictures presented to them by a trained researcher. Children enjoy these activities as they are carried out in a game format. The time necessary to complete the activities with your child will be approximately 15 minutes.

All information that you and your child provide with us will be kept completely confidential. Anonymity will be guaranteed by using a number/letter system to identify the questionnaires returned and children activities completed. You and your child may terminate your involvement in this research project at any time without any negative repercussions.
As a reward for your participation in this research project, a drawing of two $25 dinner certificates at a restaurant in Corvallis for those families in which both parents (mothers and families) and their children have successfully completed the research project will be made.

If you are willing to participate in this research project, please sign the attached Permission Sheet, authorizing your child's participation in the research project, and return the completed Parent-Child Questionnaires in the envelope provided to a designated box in your child's classroom.

Thank you very much!

Sincerely,

Shu Liang, Graduate Assistant     Alan I. Sugawara, Professor

Department of Human Development and Family Sciences

Oregon State University

Corvallis, OR 97331
Appendix B

Permission Form

I ________________ allow my child ______________________

(Print your name) 
(Print your child's name)

to participate this project.

______________________  ______________________

Signature               Date
Appendix C

Parent-Child Relationships Questionnaire

Listed below are statements focused on various aspects of parent-child relationships that you may encounter in your lives. Please read each of the statements carefully and rate them using the following scale.

<table>
<thead>
<tr>
<th>A</th>
<th>a</th>
<th>d</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>strongly agree</td>
<td>mildly agree</td>
<td>mildly agree</td>
<td>strongly agree</td>
</tr>
</tbody>
</table>

Indicate your opinion to each statement by drawing a circle around "A" if you strongly agree, around "a" if you mildly agree, around "d" if you mildly disagree, and around "D" if you strongly disagree. There are no right or wrong answers to each statement, so answer each statement according to your own opinion. It is very important that you rate all of the statements found in this questionnaire. Some of the statements may appear alike to you, however, all statements in this questionnaire are necessary to show slight differences of opinion among people.

Note: Please do not discuss your answers with your spouse, and return your completed questionnaire to your child's teacher in one of the self-addressed envelops provided.

1. Children should be allowed to disagree with their parents if they feel their own ideas are better.
   A a d D

2. When a parent asks a child to do something the child should always be told why.
   A a d D

3. A child should be taught that there are many other people that he/she will love and respect as much or more than his/her own parents.
   A a d D

4. Children should never learn things outside the home which make them doubt their parents' idea.
5. Parents very often feel they can't stand their children a moment longer.

6. There is no excuse wasting a lot of time explaining when you can get kids doing what you want by being a little clever.

7. Children have every right to question their parents' views.

8. Children should grow up convinced their parents always know what is the right thing to do.

9. Most parents can spend all day with the children and remain calm and even tempered.

10. Children should be encouraged to tell parents about it whenever they feel family rules are unreasonable.

11. Parents should adjust to the children some rather than always expecting the children to adjust to the parents.

12. Most children soon learn that their parents were mistaken in many of their ideas.

13. There is no excusing someone who upsets the confidence children have in their parents' ways of doing things.

14. The things children ask of a parent after a hard day's work are enough to make anyone lose his/her temper at times.

15. Often you have to fool children to get them to do what they should without a big fuss.

16. If parents are wrong they should admit it to their children.

17. Children soon learn that there is no greater wisdom than that of their parents.
18. Parents should keep control of their temper even when children are demanding.
   A a d D

19. A child's ideas should be seriously considered in making family decisions.
   A a d D

20. In a well-run home children should have things their own way as often as the parents do.
   A a d D

21. Loyalty on the part of children to their parents is something that the parents should earn.
   A a d D

22. A parent should never be made to look wrong in a child's eyes.
   A a d D

23. It is natural for parents to "blow their top" when children are selfish and demanding.
   A a d D

24. It is best to trick children into doing something they don't want to do instead of having to argue with them.
   A a d D

25. Good parents can tolerate criticism of themselves even when the children are around.
   A a d D

26. Loyalty to parents comes before anything else.
   A a d D

27. Raising children is an easy job.
   A a d D

28. When children are in trouble they ought to know they won't be punished for talking about it with their parents.
   A a d D

29. As much as is reasonable a parent should try to treat a child as an equal.
   A a d D

30. A parent should not expect to be more highly esteemed than other worthy adults in their children's eyes.
   A a d D

31. It is best for children if they never get started wondering whether their parents' views are right.
32. It is a rare parent who can be even tempered with his/her children all day.

33. You have to fool children into doing many things because they wouldn't understand anyway.

34. When children think their parents are wrong they should say so.

35. More parents should teach their children to have unquestioning loyalty to them.

36. Most parents never get to the point where they can't stand their children.

37. Children have a right to their own point of view and ought to be allowed to express it.

38. Children are too often asked to do all the compromising and adjustment and that is not fair.

39. Loyalty to parents is an overemphasized virtue.

40. Children should not question the thinking of their parents.

41. Raising children is a nerve-wracking job.

42. When children are doing something they shouldn't, one of the best ways of handling it is to just get them interested in something else.

43. Children should be encouraged to look for answers to their questions from other people even if the answers contradict their parents'.

44. Children should always love their parents above everything else.

45. There is no reason why a day with the children should be upsetting.
Appendix D

Demographic Information

1. What is your age? ______________________
2. What is your marital status? ________________
3. What is your religious affiliation? ________________
4. What is your ethnic background?
   ____ African American
   ____ American Indian
   ____ Asian or Pacific Islander (Please specify ____________)
   ____ Middle Eastern (Please specify _________________)
   ____ White (Please specify ____________________________)
   ____ Other (Please specify. __________________________)
5. Please check the last level of education you have completed.
   ____ less than 7th grade
   ____ junior high school (7th - 9th grade)
   ____ partial high school (10th - 11th grade)
   ____ high school graduate (whether private, public, trade, or GED)
   ____ partial college (at least one year) or specialized training
   ____ standard college or university graduate
   ____ graduate degree
6. What is your present occupation (Please be as specific)?

   ____________________________________________
7. Please list the age and sex of all children in the family.
   a. age ____ sex ____   b. age ____ sex ____
8. Please check the last level of education your mother and father have completed.

Mother
(check one)
__ less than 7th grade
__ junior high school (7th-9th grade)
__ partial high school (10th-11th grade)
__ high school graduate (whether private, public, trade or GED)
__ partial college (at least one year) or specialized training
__ standard college or university graduate
__ graduate degree

Father
(check one)

9. What is/was your mother's occupation, including homemaker
(Please specify)? ____________________________

10. What is/was your father's occupation, including homemaker
(Please specify)? ____________________________

11. Please give the amount of time your child (that attends this center) spends with his/her peers (including time spent in this center and elsewhere) ________ hours per week

12. Are there any comments you would like to make about this questionnaire? If so, please do so in the space provided below.