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DETERMINANTS AND INFLUENCES OF SIBLING RELATIONSHIPS IN CHILDHOOD AND ADOLESCENCE

by

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ABSTRACT

DETERMINANTS AND INFLUENCES OF SIBLING RELATIONSHIPS IN CHILDHOOD AND ADOLESCENCE

By

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This study examined how family structure variables (e.g., birth order) and the quality of the parent-child relationship influence the child-sibling relationship, and how this related to child functioning at age three and adolescence.

The sample included 83 sibling pairs from the New York Longitudinal Study (Thomas & Chess, 1977). Children (38 males, 45 females; all Caucasian) were from well educated, two-parent families of middle- or upper-middle SES.

Results indicated that later borns had more positive sibling relationships compared to first borns at both times. Maternal concern at age three predicted more sibling problems. During adolescence, males who rated their relationship with their mother more positively had more positive sibling relationships. More positive father-daughter interaction was related to negative sibling relationships. Quality of sibling relationships was positively related to age three child functioning, and to social skills for females during adolescence. Sibling relationships did not show continuity from age three to adolescence.

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CHAPTER I

PROBLEM STATEMENT

Siblings can be rivals, confidants, best friends, and/or a combination of all these. Most children (over 80%) in the United States have siblings (Dunn, 1992) whom they spend a significant amount of time with, especially in the young childhood years. This shared time affords them many opportunities for interaction, most likely leading them to influence each other in their development. Over the course of their lifetime, some siblings will develop close relationships with one another while others will have conflictual relationships that begin at a young age and continue into adulthood. These differences in the way siblings interact are a concern for parents. Some parents may worry as to why their children don't seem to get along or why one is so hostile towards the other (Dunn, Slomkowski & Beardsall, 1994).

Because the ways in which siblings relate to one another have been associated with their psychological adjustment and well-being (Daniels, Dunn, Furstenburg Jr., & Plomin, 1985), with various aspects of socio-cognitive development (Dunn, 1983; Dunn, Brown, Slomkowski, Tesla & Youngblade, 1991), and with being a protective buffer against the possible effects of a conflictual martial relationship (Jenkins, 1992), the interactions and relationships that develop between siblings are of interest to researchers. This is evidenced by the great increase in the number of studies on siblings within the last several years (Boer & Dunn, 1992).

A child grows up in the context of the family, of which a majority include siblings. The prominent role of the family as an influence on the developing child is well-documented. The family serves as the link between the child and society (Lerner

& Spanier, 1978), and is arguably the most significant context in which children are socialized (Bronfenbrenner, 1979; Garbarino, 1982). Garbarino (1982) describes the family as the "headquarters for human development." Subsequently, members within the family (not only parents, but brothers and sisters as well), can have major developmental influences on the child.

Several researchers (Dunn, 1992; Maccoby & Martin, 1983) have advocated the study of these within family processes in addition to between family processes. Research in both areas are useful in elucidating the process of a child's development. However, studies of intrafamilial relationships are worthwhile since differences within families may be as vast as the differences between families. This current study will use the New York Longitudinal Study (NYLS), a dataset spanning three decades, to investigate several aspects of an individual's development in the context of his or her sibling relationship.

To understand how a child develops there is a need to look not only at the child but to also take a broader look into the context, or ecology in which he or she lives. In Bronfenbrenner's (1989) words, "human development is understood in its human context." A perspective that describes human growth and change in relation to his or her surroundings is *developmental contextualism*. Adopting this viewpoint as a theoretical basis for conducting research in this area of human development (sibling relationships) will be useful since it recognizes the complex factors influencing a developing child. A review of the concept of developmental contextualism will lay the groundwork for the rationale of this current study, followed by a discussion of the literature in the area of interest - sibling relationships.

CHAPTER II

LITERATURE REVIEW

Developmental Contextualism

Views on human development have evolved much over the years in the field of psychology. Very briefly, early theories on human development proposed a one-way path from the environment to the child. The child was simply a black box receiving stimuli from the environment. One component of the environment that was the focus of many studies was the child's parents. Until the 1960s, studies of the parent-child relationship assumed that the path of influence flowed from the mother and father to the child. Bell (1968), however, astutely pointed out that these studies were all correlational in nature. There was no direct evidence that parental child-rearing caused certain child characteristics. Bell concluded that the child may very well be affecting their parents as parents were affecting their child.

Piaget (1965) also had a great impact on the way children were conceptualized. He emphasized that children were active participants in shaping their own development. Due to theorists like Bell and Piaget, views of child development gave way to the realization that children were not merely passive recipients of environmental influences but rather that they, too, impacted their environment. They actively affected their surroundings just as their context affected them. This constant interaction between the child and environment is now recognized to be a major component of a child's development. A perspective that emerged from these theories is developmental contextualism (Lerner, 1984, 1986, 1988, 1991). This perspective emphasizes the uniqueness of each individual and attempts to describe the remarkable

complexity of human development. It is a very contextually sensitive approach to understanding the growing child.

Lerner (1984) describes two key propositions in the developmental contextual view of human development - those of *embeddedness* and *dynamic interaction*. The concept of embeddedness proposes that individuals live and function on many levels, often simultaneously. These multiple levels are: the inner biological, individual psychological, dyadic, social network, community, societal, cultural, outer-physical, ecological, historical, etc. (Lerner, 1993).

Bronfenbrenner (1989) has also articulated several qualitatively different systems of influence, each including an increasingly wider range of settings, that are very similar to the idea of levels in developmental contextualism. Bronfenbrenner's ecological systems theory describes four distinct systems in which an individual is embedded. First, there is the microsystem (consisting of the immediate settings experienced by the individual), the mesosystem (characterized by the relationships between each of these settings), the exosystem (the relationship between the mesosystem and systems that indirectly influence the individual), and finally, the macrosystem (encompassing cultural and societal influences in which all the three - micro-, meso-, and exo-system - are embedded). An individual is connected to, and is a part of, these many different systems. Thus, a child's functioning is affected by the people around them (e.g., their family, their peer group), the people and institutions they are not directly involved with (e.g., their parent's work place, the school board), and other, less tangible influences (e.g., society, culture).

These various levels that Lerner and Bronfenbrenner articulate interact, influence and are influenced by, shape and are shaped by the individual. Change at one level results in change in all other levels (Bronfenbrenner, 1989; Lerner, 1986, 1991). This is presented by Lerner as the second key proposition of developmental contextualism - of dynamic interaction. The different levels in which an individual exists and interacts are at the same time affecting and being affected by one another (Lerner, 1991; Nesselroade & von Eye, 1985).

For example, there is a process of mutual influence between a parent and child that characterizes the development and socialization of the child (Lerner & Spanier, 1978). Likewise, the process of mutual influence between siblings does the same. In both cases, each of the participants have unique qualities and experiences that they each bring to the relationship. These qualities and experiences that characterize each child act upon one another, resulting in bidirectional effects between the siblings. The influences of a child and his or her sibling (or other aspects of the environment) are not additive, but rather, they are interactional. Thus, the whole (e.g., the relationship) is more than the sum of its parts (e.g., each individual) (Bronfenbrenner, 1989).

Because an individual affects and is affected by the people, events, and environment surrounding them, the process of development that the individual undergoes can be elucidated by the analysis of the nature of these many linkages. Since these relationships do not remain static and unchanging, the analysis must also include the dimension of time (Lerner, 1991). Developmental contextualism is a "multi-leveled" and "change-oriented" view of human development (Lerner, 1993). It

is a complex but very "real" way of examining the processes of development at any point in life.

Although the developmental contextualism perspective is a comprehensive and useful framework to adopt in understanding the developing child, it is not feasible to conduct research that simultaneously attempts to examine the multitude of factors involved. Therefore, the researcher must decide on a specific area of influence on the child to study. Since the context of the family is central to the development of a child, the current researcher chose to examine the relationships between family members, with a focus on siblings.

For many years researchers have only examined the mother-child dyad in attempting to understand the development of the child. Now, however, it is widely acknowledged that the mother is not the sole influencer of the child. Researchers such as Lamb (1975, 1976) and Parke (1978) have delineated the important role fathers can play in raising a child. Nonetheless, the child grows up in a network of relationships that includes more than the mother and father. Within the family, a child and his or her siblings also interact and affect each other's development. This interaction between siblings is qualitatively different from interactions between parents and their son or daughter (Baskett & Johnson, 1982). Many researchers now recognize that family relationships must be envisioned as a system where there exists significant and complex interactions between members on one another. Siblings are a part of this interacting network.

Bank and Kahn (1982) describe certain changes in our culture over the last hundred years that have prompted the sibling relationship to be viewed as a more

relevant part of the family system. One is the diminished family size. A child will now mostly likely have only one or two siblings, thus creating more opportunities for "greater interdependence and intensity" in that relationship. There is also a prolonged time period for these opportunities to occur since the increasing life-expectancy that is possible today allows siblings to share a longer lifetime together. Furthermore, the researchers speculate that the ease with which one can move throughout the country (so that family members are now more easily separated), along with high rates of divorce, may encourage siblings turn to one another to act as a support system.

In sum, siblings have the potential to impact one another. Thus, the relationship between them warrants closer examination. The following sections will present literature that has accumulated over the years regarding siblings. The review will begin with a look at the unique aspects that characterize the sibling relationship, then focus on the tasks that this relationship fulfills. This will lead into a discussion on the nature and qualities of sibling relationships in childhood and adolescence. Lastly, the primary determinants and influences of the quality of sibling relationships are reviewed.

Unique Aspects of the Sibling Relationship

There are certain characteristics of the sibling relationship that distinguish it from the relationships a child experiences with other members of his or her family and peers. Cicirelli (1982) points out four unique aspects of the bond between brothers and sisters. First, is the duration of the relationship. The relationship a child has with a sibling may be the longest lasting one in his or her entire lifetime. The birth of the second child marks the beginning of a relationship that continues on

until the death of one of the siblings. Secondly, siblings share a great deal of life experiences with one another. They have a "common genetic heritage" (those siblings that are not adopted), a "common cultural milieu", and "common early experiences." Thirdly, for most siblings, those who do not have many years between them, the relationship is characterized as being egalitarian. Similar to their peer relationships, siblings interact on the same level. Lastly, another defining characteristic of a sibling relationship is that there is no choice of terminating the relationship. Unlike friendships, which begin and perhaps end, depending on the circumstances, siblings are bound together for a lifetime. They share a family tie that cannot be broken[1]. Siblings can be a "lifelong source of friendship and support," (Cicirelli, 1982).

Tasks of Sibling Relationships

Goetting (1986) outlined the developmental "tasks" of siblingship over the life cycle, recognizing that at different points during their lifetime, siblings will vary in their function and degree of influence. Some of the tasks of siblings during childhood and adolescence (and perhaps later on as adults) are: companionship and emotional support, caretaking, and aid and direct services (e.g., joining together for support in dealing with parents). Based on her review of the literature, Goetting states that certain sibling functions "are constant, weaving threads of consistency from birth to death, while others stand out as idiosyncratic to the context of the particular stage in the life cycle."

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[1]However, despite this unbreakable family tie, it may also be the case that some siblings may choose not to continue to maintain contact with one another and thus, the interaction and influence between siblings is lessened. This is just one example of the many individual differences that exist within the range of these unique aspects of sibling relationships.

The unique connection between a child and his or her sibling and the potential for this connection to affect each of their lives has prompted researchers to explore this relationship further. Following is a review of the literature of sibling relationships in childhood, and then, of sibling relationships later in life, during adolescence.

Nature of the Sibling Relationship in Childhood

It is during the childhood years that siblings will most likely spend the most extensive amount of time with one another compared to other points in their lifespan. Siblings (those who are not separated by parental divorce or adoption) are in direct contact with one another on a daily basis. They must learn to share space and common resources such as toys, food, and parental attention.

In a review on sibling relationships in childhood, Dunn (1983) attempts to explain the nature of the relationship by categorizing the interaction between siblings as being *reciprocal, complementary*, or expressing elements of both. Reciprocal interaction is also characteristic of peer relationships. It involves the imitation of siblings, usually the younger of the older. Pepler, Corter, and Abramovitch (1982) found that almost one third of all interactions between the 20-month old second born and their older siblings were imitative. Lamb (1978a, 1978b) also found a high frequency of the younger sibling imitating the older. He suggested that this imitative aspect of the relationship may lead the older sibling to help their younger in "mastery of the object environment", and in this way, influence the cognitive development of the young child.

Another aspect of the reciprocity of the sibling relationship can be seen in the affect, whether it is positive or negative, between siblings. For example, in the Pepler et al. (1982) study, siblings displayed affectionate behavior towards one another and enjoyed cooperating together while playing games. Expressions of concern and attempts to help and comfort one another were also frequently noted. Dunn (1983) summarizes the close affect that can exist between siblings, "since what distresses, pains, or excites a sibling is very close to what distresses, pains, or excites the child, the child is likely to be far better placed to understand and find remedies for a sibling's distress than for the distress of an adult."

In addition to reciprocal interaction between siblings, another type of interaction is characterized as being complementary. Complementarity is more characteristic of parent-child relationships rather than peer relationships. For example, complementarity can be seen in the caregiving, attachment and teaching behaviors between siblings. Stewart's (1983) study of four year olds and their younger siblings revealed that if younger siblings were distressed when separated from their mothers, more than half of the older siblings effectively and promptly comforted their younger siblings. In this same study, attachment behaviors (e.g. moving closer and using the older siblings as a "secure base") were exhibited by the younger siblings when they were left in a strange room.

Another aspect of complementarity is the teaching behaviors that can be evident in sibling relationships. Cicirelli (1972, 1976) conducted several studies on siblings and found that older siblings (age 8 or 9 years) could act as effective teachers to their younger siblings (age 6 or 7 years). Azmitia and Hesser (1993) also found,

in their sample of 7 and 9 year old child-sibling pairs and child-peer pairs, that siblings were more effective teachers than peers were. When compared to older peers, older siblings gave more explanations, more positive feedback, and let their younger siblings take more control of the task. However, these were not only one-way actions. The younger children also requested more explanations and exerted more pressure to take more control of the task from their older siblings instead of their older peers. The researchers concluded that siblings are unique and important agents of cognitive development.

The concept of continuity in sibling relationships was addressed by Stillwell and Dunn (1984) in their study of aggression and friendliness in sibling relationships in preschoolers. The researchers were interested in how stable these qualities were over time. They found that over a three to four year period, the first born's behavior (showing aggression and/or friendliness) towards their younger sibling remained quite stable. These results suggest that certain dimensions evident in the sibling relationship at an early age may exist for at least several years. One limitation of the study, however, is that the sample size was very small (13 girls and 12 boys), so these results cannot be generalized.

Dunn et al. (1994) also found stability in individual differences (positive or negative behavior) in the way children behaved towards their siblings from preschool to early adolescence. Although there was evidence of continuity over this period of time, the researchers note that the quality of some of the sibling relationships did not remain stable, but changed. They describe several life-events (e.g., marital disharmony, maternal illness, accidents) and social developments (e.g., development

of relationships with friends, teachers, etc.) that could contribute to the change in the relationship.

Another aspect of continuity, whether early experiences have later effects on the sibling relationship, was studied by Volling and Belsky (1992). Based on their findings, they concluded that early relationship experience between parents and their firstborn children (e.g. being insecurely vs. securely attached) at one year of age, had a lasting effect on the quality of sibling relationships five years later. More specifically, those children who had insecure attachments to their mother at one year had higher levels of conflict and aggression with their sibling at 6 years, compared to those who were securely attached. These studies support the notion that there appears to be some continuity in relationship experiences with siblings over time, at least within the time periods studies.

Qualities of the Sibling Relationship

Furman and Buhrmester (1985a) investigated the qualities of sibling relationships in elementary school-aged children. When the children talked about their siblings they gave very detailed descriptions about the positive and negative features of the relationship. Through interviewing these children, four dimensions of the relationship emerged - warmth/closeness, relative power/status, conflict, and rivalry. The results were replicated in a later study on sibling relationships also involving school-aged children (Vandell, Minnett, & Santrock, 1987).

With the exception of power/status, these dimensions continue to be descriptive of sibling relationships later on in life. For example, Stocker and McHale's (1992) study involving preadolescents reported that affection, hostility and

rivalry were observed between siblings. Both these researchers and Vandell et al. (1987) found that the positive and negative dimensions, warmth/closeness and conflict, were relatively independent and uncorrelated, suggesting that they are not simply "bipolar aspects" of the relationship. Instead, both qualities can and do exist simultaneously in the relationship. The failure to find the power/status aspect in the preadolescent sibling pairs that Stocker and McHale studied could be due to the fact that, as other research has documented (Buhrmester & Furman, 1990; Cicirelli, 1982; Stoneman, Brody, Davis & Crapps, 1989), the relationship between siblings becomes more egalitarian as the children grow older. These studies reveal a multifaceted picture of the nature of sibling relationships in young childhood continuing on into adolescence.

Sibling Relationships in Adolescence

Earlier research on sibling relationships has solely focused on the early childhood years. Perhaps because as children approached adolescence they began to spend less and less time at home, it was thought that the influence and significance of the sibling relationship also became less and less, leading to such a narrow range of study (Stocker & McHale, 1992). Researchers such as Cicirelli (1982), however, highlighted the need to broaden the focus and to look at the relationship across the life span. Lamb and Sutton-Smith (1982) adopt the life-span perspective in acknowledging that over time, all relationships (including sibling) undergo changes and that "any 'effects' may be eliminated, reinforced, or altered by later experiences." Consequently, in order to understand the nature and effects of the

sibling relationship it is important to study a later point of the lifespan such as adolescence.

What does the sibling relationship look like in adolescence? Siblings are still considered to be significant people in the world of adolescents (Blyth, Hill & Thiel, 1982; Lempers & Clark-Lempers, 1992). Adolescents regarded their relationships with their brothers and sisters as being conflictual as well as nurturing and intimate (Furman & Buhrmester, 1985b; Lempers & Clark-Lempers, 1992).

The sibling relationship can be an arena where intimacy and arguments are both allowed expression. This may permit "unique learning experiences" (Furman & Buhrmester, 1985b) for certain aspects of adolescent development such as autonomy or self-esteem. For example, arguments may lead adolescents to learn how to resolve disagreements, and to come to a mature understanding of themselves as unique individuals possessing different ideas and opinions from others. (Lempers & Clark-Lempers, 1992). In support of this, Raffaelli's (1992) study of sibling conflict in early adolescence suggests that conflict during this period of life performs several functions such as "reinforcing family and relationship rules and delineating interpersonal boundaries."

How does the sibling relationship during adolescence compare to the relationship during childhood? There are conflicting findings regarding certain aspects of the sibling relationship as it continues over time. Some investigators report that the relationship becomes increasingly close and supportive (Cicirelli, 1982). Likewise, in Stoneman and Brody's (1993) study, as the children grew from early childhood reaching towards adolescence, siblings became more socially engaged with

each other, and the relationships became more positive. However, other investigators report no significant changes in emotional closeness in the relationship (Raffaelli & Larson, 1987).

For most siblings, the relationship during adolescence is characterized by the development of an "egalitarian, role-sharing relationship" (Cicirelli, 1982; Stoneman et al., 1989). Similar to Cicirelli (1982) and Stoneman et al.,'s (1989) findings, Buhrmester and Furman (1990) also found less asymmetry and more egalitarian sibling relationships in adolescence[2]. They also noted that as children grew older their relationships became less intense in both the warmth/closeness and the conflict dimensions. They attributed this to the decrease in interaction with family and the increase in the amount of time that adolescents spend with their peers. Perhaps in the adolescents' quest for autonomy, they prefer to spend less time with their family (which includes siblings) and more with friends. The researchers do reiterate, however, that some adolescents will maintain very close relationships with their siblings and that examining group averages, as they did in their study, masks individual differences in the relationships.

Sibling relationships in adolescence are similar in some respects to relationships in childhood. For example, the notions of reciprocity and complementarity documented in studies of young children appear to exist in

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[2]Of course, it may be less likely for those siblings with many years between them to develop an egalitarian relationship. The years of separation may make it difficult to view each other as equals. However, perhaps in adulthood when the age differential may not be as dramatic (for example, the difference between a 10 year old and 20 year old is much greater than the difference between a 40 and 50 year old) it is possible that age spacing will not contribute much to the quality of sibling relationships.

adolescent sibling relationships as well (Abramovitch, Corter, Pepler & Stanhope, 1986). And in other respects, the relationship may differ. For example, Furman & Buhrmester (1990) reported that the intensity of the sibling relationship on several dimensions (e.g., warmth/closeness, conflict, power status) appeared to lessen as children move into adolescence.

The range of qualities that characterize the relationship can vary greatly in both age periods. Some siblings are warm and intimate with one another, others conflictual and negative. Most likely, interactions between siblings encompass a combination of both. The following section examines research on the influences on the sibling relationship that may account for this range of qualities.

Furman and Buhrmester's Model of Sibling Relationships

Furman and Buhrmester (1985a) proposed a model of the bidirectional influences of sibling relationships and other variables. The sibling relationship itself is comprised of four dimensions - warmth/closeness, relative power/status, conflict, and rivalry - that Furman and Buhrmester (1985a) distinguished after analyzing interviews in which children and their siblings described aspects of their relationships with each other.

The three domains of variables that seem to be primary determinants of the quality of these relationships between siblings have been identified by these researchers. These domains are 1) family structure variables (also called sibling status variables or family constellation variables), 2) parent-child relationships, and 3) characteristics of individual children. The first domain of family structure variables includes age of siblings, age difference between siblings, the child and sibling sex

pattern, family size, and birth order. The second domain of parent-child relationship variables includes the quality of relationships and the management of sibling relationships. Lastly, the third domain of determinants, characteristics of the individual children (the child and his or her siblings), include socio-cognitive factors such as perspective-taking skills, and personality factors such as temperament and child functioning. These domains of determinants, with the exception of family structure variables which are unchangeable, have bidirectional links to the sibling relationship. Each domain affects the other.

One criticism of the Furman and Buhrmester model is that it does not include the dimension of sibling separation, which is for the most part ignored in the sibling literature. The choice to move (not necessarily physically) away from a sibling could be due to "apathy, geographic separation, lack of emotional availability, and divergence in values and lifestyle," (Bedford, 1989). These choices of separation will, of course, affect the relationship siblings have with one another. Research in this area is needed to clarify factors contributing to these decisions that weaken the sibling bond, and what developmental significance, if any, this holds.

The following will describe each of the components of a slightly modified (a bit more detailed) model of sibling relationships proposed by Furman and Buhrmester (1985a) (see Figure 1). The first domain of influences on the quality of sibling relationships (family structure variables) will be discussed first, followed by the second domain (the parent-child relationship), and lastly, the third domain, (characteristics of the individual children).

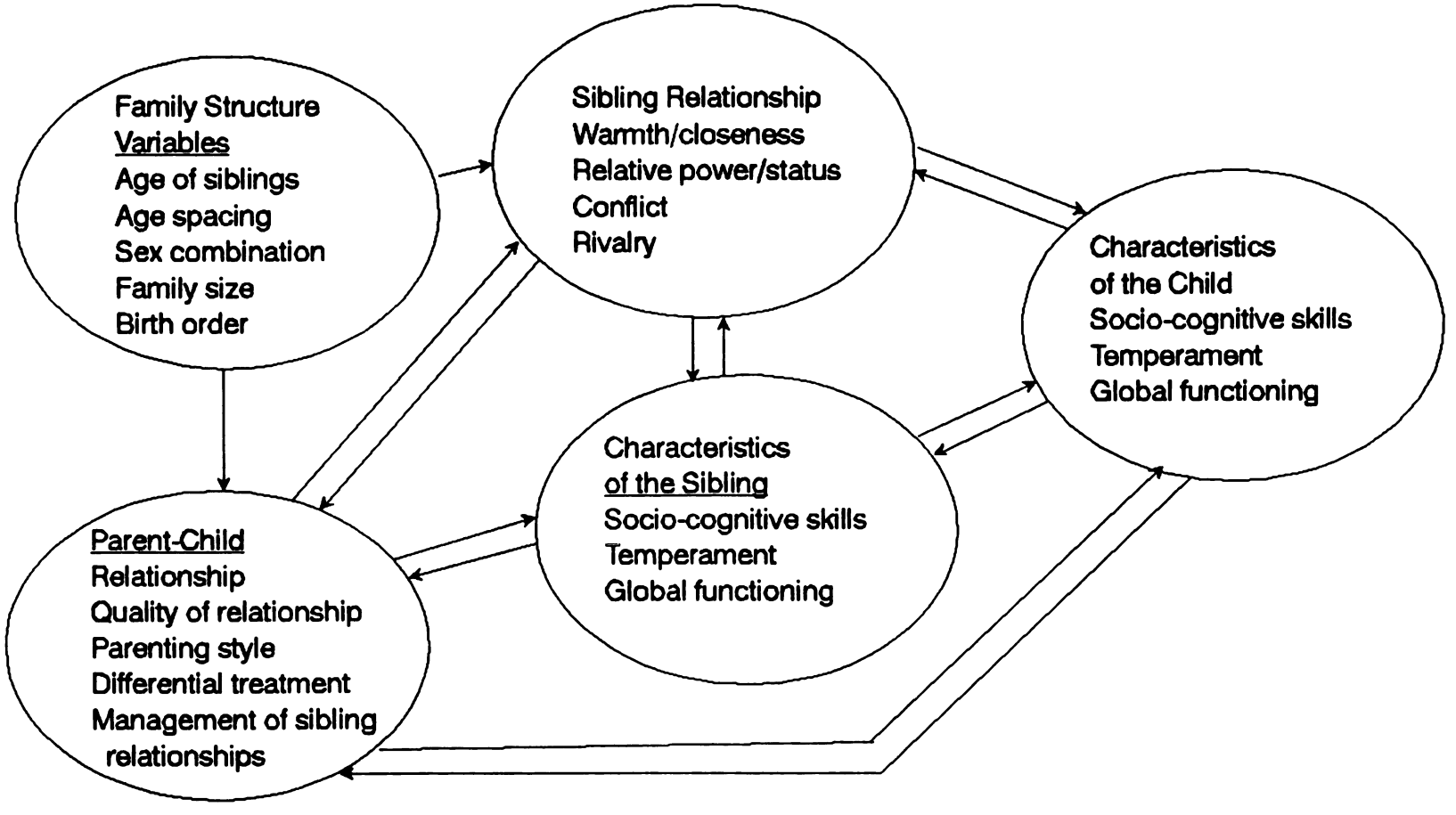

Figure 1. Theoretical model of the primary determinants and influences of the quality of sibling relationships*

*Based on Furman and Buhrmester's (1985a) model

Family Structure Variables

Past research has simply looked at how family structure variables are linked to child outcomes. One example is the many studies on the effects of birth order on achievement (Schacter, 1963) and personality traits (Lahey, Hammer, Crumrine, & Forehand, 1980; Sampson, 1965). A drawback of these studies, however, is that they did not specifically attempt to investigate *why* these links appeared to exist. For instance, is it because parents treat first and second borns differently, thus leading each child to develop differently?

In response to this gap in the literature, more recent research has attempted to describe the process that links family structure variables to certain child outcomes. Furman and Buhrmester (1985a) have proposed that the sibling relationship and the parent-child relationship be conceptualized as mediating variables linking the family structure variables (e.g., birth order, age spacing) to certain child characteristics. The literature is mixed regarding the relative influence of family structure variables on the sibling relationship. Some studies report the variables to have an effect on sibling relationships (Minnett, Vandell & Santrock, 1983) while others report no or very little effect (Dunn, 1987; Dunn & Munn, 1986; Stocker, Dunn & Plomin, 1989). Although there has been a shift away from the focus of family structure variables on to other influences (e.g. child temperament, parental differential treatment) on the sibling relationship and resultant outcomes, family constellation effects are still informative.

Age of siblings

Sibling closeness appears to change across the lifespan (Ross & Milgram, 1982). That the sibling relationship appears to become increasingly positive with age has been documented in several studies. For siblings in middle childhood, companionship and "positive emotional tone" increased as the children grew older (Vandell et al., 1987). Along the same lines, Stocker et al. (1989) found in their sample of school-aged children that more positive and less negative sibling relationships were more characteristic of older, second-born children compared to those second-born children who were younger. The mothers of older second-borns rated the sibling relationships more positively than did mothers of younger second-borns. Likewise, in Stoneman and Brody's (1993) study of 5-14 year olds, chronologically older siblings experienced warmer and more positive relationships. As mentioned above in the discussion on sibling relationships in adolescence, studies have reported that as the children approached adolescence, the relationship with their sibling appeared to become increasingly close and supportive (Cicirelli, 1982, Ross & Milgram, 1982).

However, in some cases, although the relationships appear to become more positive, there may also be more conflict involved. Vandell et al.,'s (1987) study found that even though the positive emotional tone of the sibling relationship increased with the age of the children, sibling conflict also increased. Minnett et al. (1983) speculate that the negative behaviors (e.g. aggression, cheating, dominance) observed in their sample of school-age children, could be because of the increased

opportunity for competition when both siblings attend school. These findings again point to the multidimensional nature of the sibling relationship.

The diverse findings on the effect of age on the sibling relationship suggest that other influences may outweigh this structural variable. Life events, the wider range of relationships experienced, and the development of a child's social skills all may be more powerful contributers to the sibling relationship than age.

Male vs. female sibling pairs

There appear to be differences in the interaction between female sibling pairs and male sibling pairs. In preschool and school aged children, male sibling pairs were more physically aggressive than female sibling pairs (Abramovitch, Corter, & Lando, 1979; Minnett et al., 1983). Another study on school-aged children reported that male sibling pairs engaged in less interaction and at the same time, proportionally more negative interactions than female sibling pairs (Stoneman & Brody, 1993). Gold (1989) found that sisters in old age have the closest relationships compared to brothers and to sister-brother pairs. Similarly, Buhrmester and Furman (1990) found that girl sibling dyads in middle childhood and adolescence rated their relationships significantly higher than boy sibling dyads in intimacy, companionship, similarity, and admiration. Their results replicated an earlier study (Furman & Buhrmester, 1985a) that also showed girls feeling more positive towards their sisters than boys to their brothers. Cicirelli (1982) found that in early adulthood, sisters felt closer to each other than brothers did. The majority of the studies indicates that sister pairs may be more positive than brother pairs.

Sibling pairs of the same sex vs. mixed sex

There are conflicting findings on the effects of the sex combination of sibling dyads in regards to the sibling relationship. Several studies involving infants and preschool age children have not found one combination to be experience a more positive relationship than the other (Dunn et al., 1994; Lamb, 1978a, 1978b, Volling & Belsky, 1992). However, other studies have found differences. For example, same-sex pairs have been found to be less controlling and less competitive and were described by their mothers as having more positive relationships than mixed-sex pairs age (Stocker et al., 1989). Same-sex pairs have also been found to report greater feelings of warmth and closeness (Dunn, 1983; Furman & Buhrmester, 1985a), and more frequently exhibited positive social behavior (Dunn & Kendrick, 1981) when compared to mixed-sex pairs in very young children. To explain their findings, Dunn & Kendrick (1981) suggest that children are more likely to get along with siblings of the same sex since they would identify with each other more. It was interesting that in the Dunn & Kendrick (1981) study, for same-sex sibling pairs, a negative correlation was found between the positive and negative behaviors shown by the older child to the younger. However, in different sex pairs, there was no significant correlation between positive and negative behaviors - some pairs showed a high frequency of positive *and* negative behaviors towards their siblings. In this sample, it appears as if different-sex sibling pairs may experience a more ambivalent relationship than same-sex pairs. Studies of siblings in other cultures also reveal that same-sex siblings show more friendly behavior and less aggressive, hostile behavior than different-sex pairs (Whiting & Whiting, 1975).

In contrast to these studies that find same-sex sibling dyads interacting more positively than different-sex sibling dyads, Minnett et al., (1983) found that in their sample of school-age children (7-8 years old) more cheating, aggression, and dominance were evident in same-sex than different-sex pairs. These researchers suggest that their conflicting findings could be due to the fact that the children in their sample were older than the previously cited studies, and perhaps were now more competitive towards each other in the school-age years. Or, the conflicting findings could be due to methodological reasons - in this study the mother was not present with the children, and the children did not know that they were being observed whereas in the other studies the mothers and the observers were in the presence of the children.

Dunn et al.'s (1994) longitudinal study of children and their siblings from preschool to early adolescence found that gender composition effects were evident during early adolescence, but were not apparent during the earlier ages. Regarding younger sisters, adolescent girls reported more warmth and intimacy with their younger sisters than adolescent boys with their younger sisters. There was no such difference when these older children were in preschool. The results of this study contradicts Minnett et al.'s (1983) findings.

It does appear that different-sex siblings do become increasingly closer as they grow older, especially during adolescence (Ross & Milgram, 1982). This is congruent to the research presented earlier that found sibling relationships to become more positive with age. However, Ross and her colleagues did not compare mixed- with same-sex dyads to see if one combination was more positive than the other.

A review of the literature suggests that a definitive conclusion can not be reached on whether same-sex or different-sex pairs of siblings differ from one another on the quality of the relationship. However, it appears as if more studies find same-sex pairs getting along better than mixed-sex. Perhaps the structural variable of gender combination does not contribute as much to the quality of the sibling relationship than other factors, such as parental differential treatment or child temperament. More research in this area is needed to clarify the effects of gender composition on the sibling relationship.

Birth order

A vast body of research exists on the effects of birth order. Birth order has been linked to child personality (Lahey et al., 1980; Sampson, 1965), intelligence (Zajonc, 1976; Zajonc & Markus, 1975), and achievement (Schacter, 1963) outcomes. However, many of these studies have not sought to determine the process of how birth order is linked to these various child outcomes. According to Furman and Buhrmester's (1985a) model, birth order and its outcomes can be mediated by both the parent-child and sibling relationship. The focus of this next section will consider the direct effects of birth order on sibling relationships.

In previous studies on sibling interaction, children who are the older sibling have expressed more aggressive and prosocial behavior, and have also taken more of a leadership role than their younger sibling (Dunn, 1983; Pepler et al., 1982). The child who is younger has been found to imitate the older sibling (Lamb, 1978a, 1978b), and to be more submissive in his or her interactions with the older child (Abramovitch, et al., 1979; Brody, Stoneman & Mackinnon, 1982). Furman and

Buhrmester (1985a) found that earlier born siblings reported more nurturing and dominance in their relationships over their later siblings. Moreover, later born siblings reported more admiration for their older sibling.

Buhrmester and Furman (1990) investigated perceptions of the sibling relationships during middle childhood and adolescence. They found that earlier and later born siblings differed in their assessment of the relationship. Later born siblings reported a more intimate relationship with their older sibling than was perceived by the older sibling. Furthermore, earlier born siblings rated the relationship with their younger sibling as more antagonistic than the younger siblings did. The researchers speculate that the earlier born siblings may be striving towards more independence while the later born siblings want to be "more grown up" and do this by identifying with their older sibling. Cicirelli (1982) found that later in life, during the college years, later born siblings rated their relationship more positively with their older sibling than vice versa. Thus, it seems as if the order of birth will affect the siblings' perception of the relationship as well as the types of interactions (e.g. nurturing, dominance) that occur.

Age spacing

Siblings closer in age (less than two years apart) portrayed their relationships as being closer and warmer than those with a greater (more than two years apart) age difference in Furman & Buhrmester's (1985a) study of school-aged children. Yet, these children also reported the highest level of conflict at the same time. Buhrmester and Furman (1990) likewise found that more quarreling and antagonism was associated with narrower spacing between siblings in their sample of school-aged

children and adolescents. Minnett et al. (1983) also found in their school-aged sample that wider spaced siblings expressed more positive behaviors in their interactions while closer spaced siblings expressed more aggressive behaviors.

Other researchers such as Abramovitch and her colleagues (Abramovitch et al., 1979; Abramovitch, Corter & Pepler, 1980) and Dunn & Kendrick (1982) found that for young children (infants, toddlers and preschoolers) age spacing did not seem to have an effect on the quality of the sibling relationship. However, in these studies age was confounded with the age interval - the oldest children were always in the wider spaced sibling dyads. Cicirelli's (1982) much older sample of college women reported feeling more positive to siblings who were closer in age. Here, however, there is a confounding with stage of development since there is evidence that sibling relationships become more positive with age.

Perhaps with very young children age spacing does not contribute to relationships with their siblings, but during middle childhood and adolescence, it does have an effect because of an increase in opportunities for competition due to school. However, in the later years this competition and rivalry seems to attenuate (Allan, 1977; Ross & Milgram, 1982), as does the effects of age spacing, at least for some siblings. As children become adults, perhaps some of the sources of childhood rivalry are outgrown. Thus, it is possible that age spacing, as with the gender combination variable, is not as influential for the quality of the sibling relationship as children become older. It is conceivable that other factors may outweigh or mediate age spacing effects.

Family size

Family size has been associated directly with child outcomes such as intelligence (Zajonc, 1976) and sociability (Kidwell, 1981). However, little research exists on whether having one or many siblings affects the relationship siblings have with one another, which may mediate child outcome variables. The effect of size of family on the quality of sibling relationships may be linked to the child-rearing practices of the parents. For example, Elder and Bowerman (1963) suggest that opportunities for parental frustration increase when there are a greater number of children in the family since parents will have to deal with each child's wants and needs as well as the interactions that occur between siblings. These frustrations may result in parenting styles that are more punitive in an attempt to control children's behavior. Likewise, Kidwell (1981) proposes that more children in the family increases demands on parents for "time, energy, and patience". In an attempt to meet these demands, parents may have "less time for explanation and for one-to-one interaction of a supportive and positive nature" with each of their children. However, if older siblings were encouraged to take on some of the childcare responsibilities, this may alleviate some of the stress parents may experience due to having a large family. There have not been enough studies conducted to determine whether this is true.

In contrast, in Raffaelli's (1992) study involving young children, results reveal that children with two siblings compared to those with three or more, reported a significantly higher frequency of conflict in their relationships. The researcher did not speculate why children in a larger family appeared to have less arguments with

one another. This aspect was not elaborated upon in this study, and is the only study that has reported these results. As with other family structure variables mentioned above, research on how this variable of influence affects the sibling relationship would be useful.

Summary of Literature on Family Structure Variables

The review of literature suggests that some family structure variables do seem to have an influence on the relationship between siblings. The age of the child, the sex of the siblings, the order of birth, age spacing, family size, all have been found to affect the relationship, some perhaps to a greater degree than others, and at different points in the lifecycle[3]. While this is the case, researchers have realized that this does not give us the complete picture (Dunn, 1983; Munn & Dunn, 1989; Stocker et al., 1989).

Although more research on how family structure variables influence the sibling relationship is needed to clarify the effects, it is perhaps more beneficial to look to other determinants, such as the parent-child relationship, that may be a more powerful, direct contributor to the quality of sibling relationships. It is now recognized that familial relationships are intertwined, each relationship within the family affecting the relationships around it. The parent-child relationship may also act as a mediating variable that links family structure variables to the sibling relationship. This leads into a discussion of the second domain of determinants that

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[3]For example, as siblings become older and their developmental statuses become more and more similar, the age spacing between them will be of less importance in determining the quality of their relationship.

influence the quality of sibling relationships - the interaction and bond between the parent and child.

Parent-Child Relationship

The quality of the parent-child relationship appears to be influential in determining the quality of the sibling relationship. Several aspects of parenting can play a role in determining the quality of the relationship between a parent and child - child-rearing practices of the parent, maternal differential treatment, and lastly, management of sibling relationships. The next sections will review literature on how these aspects of parenting affect the quality of the relationship between a child and his or her parent, and how this, in turn, influences the relationship between siblings.

Parental child-rearing practices

Prosocial behavior between a young child and his or her sibling seems to be fostered by parents who are responsive to their child's needs and behaviors (Bryant & Crockenberg, 1980). In Bryant and Crockenberg's study prosocial behavior was defined as "activity undertaken for the well-being of others." Operationally it was defined through a cluster of behaviors such as comforting, sharing, helping, defending, etc. These researchers also noted that the expression of verbal antisocial behavior between siblings correlated with the unresponsiveness and insensitivity of the mother. Similarly, other researchers (McHale & Gamble, 1989) have found less fighting and less hostility between siblings when their mothers were more responsive and less negative to their children. In another study, maternal rejection was associated with conflictual sibling relationships (Patterson, 1986). These results are in line with Hoffman's (1976) position that when an individual's own concerns are

taken care of, it is more likely that that individual will be able to express concern for others.

In addition to responding to a child's needs, other maternal child-rearing practices also relate to the quality of sibling interaction. Brody, Stoneman and MacKinnon's (1986) study of school-aged children found that managing and helping behaviors exhibited by the older sibling to his or her younger sibling were positively associated with maternal encouragement of curiosity and openness in children, and negatively related to maternal inconsistency and anxiety induction. Less antagonistic and more prosocial behavior between siblings were linked to the mother's practice of nonpunitive control techniques. On the other hand, maternal child-rearing practices that are characterized as being intrusive or overcontrolling have been correlated with sibling conflict and aggression in preschool children (Volling & Belsky, 1992).

The studies of the link between maternal child-rearing practices and the quality of the mother-child relationship to the relationship between siblings appears to hold for older children as well. In addition, this link between child-rearing practices and sibling relationships exists for fathers. Preadolescents in Stocker and McHale's (1992) study showed more affection and less hostility toward their siblings when the relationship with their father was characterized by high levels of warmth. The amount of time that the preadolescent spent alone with their fathers also contributed to the quality of the sibling relationship. Those who spent the most time with fathers, and perceived more warmth in their relationship reported being in the most positive and least negative relationship with their siblings.

These results indicate that warm and positive child-rearing practices tends to foster the development of prosocial behaviors between siblings. However, in some cases a poor quality parent-child relationship may actually foster a close relationship between siblings. For instance, Essman (1977) found that when parents were uninvolved and/or uncommitted to their children, this created a context for siblings to take over and fulfill the caretaking role for one another. This does not mean that siblings in this situation are necessarily acting positively towards one another, but there is potential for a close relationship to develop between the sibling caretaker and the child. Similarly, in Bryant & Crockenberg's (1980) study, the ignoring and unavailability of the mothers to their children were also associated with prosocial interactions between the siblings. The researchers found significant correlations between maternal ignoring and the older siblings' behaviors (who were all first borns) with their younger siblings (who were later borns, two or three years younger than the eldest). They suggested that if requests for help by the older sibling (who were 10 years old) were ignored, this may have encouraged them to become more self-reliant and prompted them to seek out their sibling and become more actively engaged with them. Younger children (who were 7 years old), however, did not show significant correlations between maternal ignoring and exhibiting more prosocial behavior. Thus, the age of the sibling seemed to play an important role in whether maternal ignoring would influence sibling interactions positively or negatively.

This study further suggests that the behaviors of a child are affected by the mother's behavior towards the child's sibling. In addition to influencing her child's behaviors directly, a mother's behavior towards her first-born child appears to have

an effect on the quality of the relationship between the first- and second-born (Dunn & Kendrick, 1982; Stewart, Mobely, Van Tuyl, & Salvador, 1987). Dunn (1983) states that "the behavior of any two members of the mother-two child triad can have marked and immediate effects on the behavior of the third member." This again demonstrates the interconnectedness of each of the members in a family system. Furthermore, that maternal ignoring was correlated to both siblings' prosocial as well as antisocial interactions demonstrates the complexity of the relationships between family members. In this family system the child is embedded in a network of relationships that can have salient developmental influences on each of the members.

Parental differential behavior

Recently, there has been a growing interest in the field of behavioral genetics in the question of why siblings, who share the same genetic material and are raised in the same families, can grow up to be different from one another (for a review, see Hoffman, 1991). This has led researchers to attempt to account for sibling differences. One influence that seems to partially explain these differences is the *within-family environmental variation* (Loehlin, Willerman & Horn, 1988; Plomin & Daniels, 1987; Scarr, Webber, Weinberg & Wittig, 1981). More specifically, this includes differences in the way parents treat their children. This differential treatment appears to influence the way siblings relate to one another.

Parental partiality as perceived by the siblings themselves has been associated with feelings of competition and conflict between siblings (Furman & Buhrmester, 1985a). Stocker, et al. (1989) found that greater differential behavior shown by the mother to the child and sibling led to a less positive and more conflictual sibling

relationship. Likewise, Bryant and Crockenberg (1980) discovered that the children in their sample were more likely to express more negative behaviors towards their siblings, even if their own needs were well met, if there was a discrepancy in treatment of the child and sibling by the mother. These studies, and others (Daniels et al., 1985; Hetherington, 1988), conclude that differential treatment by the mother to her children is associated with the development of a more negative relationship between siblings.

Volling and Belsky (1992) have addressed whether paternal differential treatment, as well as maternal differential treatment, can also shape the sibling relationship. They investigated whether both were linked to sibling conflict and prosocial behavior in young children. They reported several interesting interactions. The connection between parental differential affection and prosocial sibling interaction depended on the quality of the father and older child relationship. If fathers were intrusive or uninvolved in their children, then differential displays of affection towards their children did not affect whether there was more or less prosocial sibling interaction. In contrast, if the father was characterized as being "facilitative" with their relationship with their older child, differential behavior did have an effect - more differential affection was associated with less prosocial sibling interaction.

Regarding mothers, if the older child was previously insecurely attached to their mother, then differential maternal control of the older child did not make a difference whether siblings were involved in more or less conflict. However, if the older child was securely attached to their mothers, then differential maternal control did have an effect - more control of the older child was associated with more sibling

conflict. These are analogous to the findings with the fathers. This study suggests that differential treatment by the parents (such as displays of affection or control) does have an effect on the relationships between siblings when certain relationship qualities with parents exists. Volling and Belsky (1992) hypothesize that perhaps an infant who develops a secure attachment with their mother or a supportive relationship with their father "experience a sense of loss when the parent now directs the attention and affection that once was solely theirs to a younger sibling. This, in turn, may breed feelings of resentment and jealousy, and more conflict and less cooperation between siblings." Volling and Belsky's study lends support to the findings of Dunn and Kendrick (1982). The latter group of researchers found that when mothers and their first-born daughters experienced an "intense playful relationship" before the siblings' birth, the daughters were more likely to display hostile and unfriendly behavior with their younger sibling, and vice versa, 14 months later. The researchers also hypothesized that a sense of a loss of affection may also explain their results.

McHale and Pawletko (1992) point out that differential treatment will have different meanings across different contexts. For example, in a child-sibling relationship where the sibling is quite a bit younger, or where the sibling is handicapped in some way, the other sibling will probably expect his or her parents to differentially treat the less able sibling because of the differing developmental abilities. Differential treatment in this context will less likely lead siblings toward a conflictual relationship. It is not known exactly what "level" of parental differential treatment may lead to poorer sibling relationships and what is considered "normal" differential treatment.

The studies cited above are examples of what Bronfenbrenner and Crouter (1983) call a "process by context" interaction. In order to fully understand a process (e.g., parental differential treatment on sibling relationships), one must also examine the context (e.g. the family structure or quality of the parent-child relationship) in which this process occurs. The process by context model allows the researcher to assess developmental outcomes as well as the processes that produce these outcomes (Bronfenbrenner, 1989). The parent-child relationship is a context for which the processes of the developing sibling relationship are taking place. Differential treatment, along with other influences on the sibling relationship, must be "grounded within the larger ecology of the family," (McHale & Pawletko, 1992).

Management of sibling relationships

Parents will have expectations of how they want their children to relate to one another, and this will determine the discipline and/or management styles they employ (Furman and Buhrmester, 1985a). The manner in which parents deal with their children's interactions may influence the sibling relationship. Kendrick and Dunn (1983) examined how mothers responded to their children's quarrels with one another. They found that the mother's intervention in the quarrels was positively correlated to the expression of hostile behavior among siblings, but more so for boys than for girls. Again, similar to much of the research linking parenting practices to sibling relationships, causal inferences cannot be drawn. It could be that the expression of hostile behavior among siblings provoked mothers to intervene more. Unfortunately, no one has followed up this study to clarify this connection further.

Quality of the parent-child relationship

The parenting practices described above, along with the characteristics of the children, will play a role in determining what the quality of sibling relationships will be. Based upon the literature, it appears as if parents who are characterized as being warm and positive, compared to those who ignore or are overcontrolling, will more likely have a relationship characterized by closeness and positive interactions with their children, and thus also be more likely to encourage positive sibling relationships. This last section covering parent-child relationships will focus on how the quality of the parent-child relationship affects the interactions between siblings.

A study by Daniels et al. (1985) found maternal closeness to the child to be associated with the sibling relationship. Less sibling friendliness was evident when there was less maternal closeness. A study mentioned earlier, by Volling and Belsky (1992), also looked at a construct similar to maternal closeness, attachment between the child and their mother, and how this attachment relationship affected the relationship the child had with their sibling. This study was unique in that it specifically attempted to link two bodies of literature of child development - attachment to the care-giver, and sibling relationships. Also, this study included fathers, who have too often been ignored despite the loud calls for research to include this long-neglected group. The researchers found that children who were insecurely attached to their mothers at one year of age experienced a more conflictual relationship with their sibling at three years of age. Furthermore, results revealed that when mothers reported a high level of conflict with their children, it related positively to sibling conflict and aggression. However, as with many other sibling

studies, the direction of effects here is not clear. Perhaps siblings who engage in more conflict induce mothers to intervene more frequently and thus produces more mother-child conflict as well.

An earlier study by Teti and Ablard (1989) also found that insecurely attached toddlers did not respond as promptly, or at all, to their younger sibling's distress while they were separated from their mother. Moreover, the researchers reported that if both the older and the younger child were insecurity attached to their mother, then both displayed more aggression in their interactions compared to those siblings who were both securely attached. From these investigations, it appears as if a more positive parent-child relationship tends to encourage a more positive child-sibling relationship.

Summary of Literature on Parent-Child Relationships

The literature reviewed has clearly shown that the relationship between a parent and child will have an effect on the quality of the child's relationship with their sibling. Although, how the relationship will parent-child relationship will affect sibling interactions is not clear-cut. The studies suggest that generally, a child who experiences a positive relationship with their parent seems to also experience a more positive relationship with their sibling. As we have seen, however, in some cases where there is a lack of parental involvement, siblings turn to each other for comfort and reassurance. That negative parenting behavior can be associated with both positive as well as negative sibling interactions points to the realization that other factors, such as the age of the children or their attachment history, must also be considered when trying to elucidate the connections. Again, the application of the

process by context model would be most useful in understanding this aspect of development.

Although all of the studies have examined the parent-child relationship and its effect on the sibling relationship unidirectionally, as stated earlier, the direction of effects can not be established. We must keep in mind that the sibling relationship will also have an effect on how the child interacts with the parent and vice versa. Research focusing the *bidirectional* path of influence that links the two relationships is needed.

Child and Sibling Characteristics

Examining the individual child that makes up part of the parent-child or the sibling-child relationship is also important. Again, just as the parent-child and sibling-child relationships are bidirectionally linked, so is the child and the sibling-relationship mutually influential. The unique characteristics that a child brings to the relationship will also be shaped by the relationship itself. The last domain of the determinants of the quality of sibling relationships is the characteristics of the children. This section will focus on temperament and socio-cognitive skills.

Temperament

Temperament has been found to influence the quality of the sibling relationship (Kendrick & Dunn, 1983). Temperament is the "stylistic" component of a child's behavior. It describes *how* a child behaves rather than *what* the behavior is or *why* the behavior is expressed (Thomas, Chess & Birch, 1968). A child's temperament is believed to exist very early in life, to be modified as they continue to grow, and to be a part of the child's genetic makeup (Buss & Plomin, 1986; Lerner, Lerner, Windle,

Hooker, Lenerz, & East 1986). Lerner et al., (1986) have described the important role that temperament plays in the development of a child. Temperament is regarded as "a useful dimension of individuality with which to study child effects on others, to study transactional relations between children and their social context, and to study the means by which children may promote their own development," (Lerner, 1993; Lerner, Castellino, & Perkins, 1993).

Thomas and Chess and their colleagues have identified three temperament types: easy, difficult and slow-to-warm up. Easy children are characterized by having positive moods, positive approaches to new stimuli, and can adapt quickly to change. In contrast, difficult children are characterized by having relatively frequent negative moods, a tendency to withdraw from new stimuli, and do not adapt quickly to change. Slow-to-warm-up children are characterized by slow adaptability, frequent withdrawal from new stimuli, and have a mild intensity of expression of moods. The child's temperament, along with the combination of the child's and their sibling's temperament may influence their developing relationship. Examples of the role of temperament in determining the quality of the relationship between siblings follows.

Research in two contexts, the home and school, point to the likelihood of children characterized by difficult temperaments to have more difficult relationships with their siblings as well as peers. Children characterized by difficult temperaments appear to be more likely to get involved in negative interactions with peers. This seems to be true in interactions with siblings as well.

Munn and Dunn (1989) found that when the older sibling displayed a high degree of inflexibility, there was less play behavior between the older sibling and the

younger sibling. When the older sibling was high in negative mood and high in distractibility (aspects of a difficult temperament), there was more conflict between siblings. Likewise, when the child was characterized as being high in negative mood, this was also predictive of a conflictual child-sibling relationship. These results indicate that children possessing difficult temperaments seem to be more likely to be involved in more contentious relationships with their siblings than other children with easier temperaments.

Not only with siblings, but children's interactions with their peers, have been documented to be influenced by the type of temperament they possess. For example, difficult preschoolers were observed to hit, push and wrestle with their peers more frequently than those who were easy or slow-to-warm up (Billman & McDevitt, 1980). In another study of preschoolers, those who were rated by their mothers as unmalleable, intense, moody and active, were found to behave more negatively towards their classmates as compared to other children (Stevenson-Hinde, Hinde & Simpson, 1986).

In addition to looking only at one child's temperament in the sibling relationship, several studies have examined how the combination of both the child's and sibling's temperament can interact and effect the relationship with one another. There are two hypotheses about how temperament affects the sibling relationship when both the child and their sibling's temperament are considered. One is the match-mismatch hypothesis, and the other is the buffering hypothesis. The match-mismatch view on temperament is proposed by Munn and Dunn (1989). These researchers examined the sibling relationship in preschoolers with respect to their

temperaments. Their results reveal that the greater the dissimilarity in temperament of sibling pairs, the higher the levels of conflict in their interactions. In other words, there was a "lack of fit" between the temperament of the child and the sibling, thus creating dissonance between the two.

In contrast, Brody, Stoneman and Burke (1987) offer an alternative hypothesis, that dissimilarity between temperaments of a child and their sibling will result in a "buffering" effect. For example, if a child has a very easy temperament while his or her sibling has a very difficult one, the child's easy temperament will act as a buffer against the difficult temperament of the sibling. Thus, the relationship would most likely continue on peacefully.

Stoneman and Brody (1993) attempted to further clarify the relationship between child temperament and sibling relationships in their study on school-age (kindergarten to eighth grade) sibling pairs. These researchers examined how two dimensions of temperament, activity and adaptability, in differing combinations, affected the quality of the sibling relationship. They found that the relationships that had the most negativity and conflict were composed of both siblings that were high in activity and where the older sibling was rated as more active than the younger. The youngest sibling's easy temperament did not appear to be strong enough to buffer the effects of an active older sibling. The relationships that were characterized as being the least conflictual were when both siblings were low in activity. Their findings demonstrate that looking solely at one sibling's temperament and examining its influence on the relationship does not give us the whole picture.

Stoneman and Brody (1993) propose that both the match-mismatch and the buffering models are needed to explain their findings. It appears as if the different combinations of the aspects of temperament (adaptability or activity) in sibling pairs interact to promote different qualitative aspects of the sibling relationship. One limitation of the Stoneman and Brody (1993) study is that the data was collected at one point in time. Consequently, although the hypothesis was that temperament would influence the relationship, this study could not confirm it directly. Longitudinal research needs to be done to clarify the direction of effects. However, this study reinforces the view that the conceptualization of the sibling dyad as an "interactive family subsystem" is most appropriate.

Brody, Stoneman & McCoy (1992) report that sibling differences in temperament (e.g, negative emotionality) are linked to the rate of parental differential treatment of siblings. In their study of school-age children, they observed a higher frequency of maternal and paternal differential treatment (favoring the younger sibling) when the younger sibling, compared to the older sibling, was rated as having a significantly higher negative emotionality. The disparity in parental treatment towards their children was observed to be less when the older sibling was rated as having a higher negative emotionality and when negative emotionality of the two children were regarded as being similar. Given these results, the researchers suggest that the combination of sibling temperaments, rather than an individual child's temperament, may be more important in determining the degree of parental differential treatment towards their children. This path of influence may also be reciprocal. Perhaps differences in negative emotionality between the siblings will

become greater as more differential treatment is given to the siblings. This discrepancy in treatment towards siblings has been shown to influence the sibling relationship.

Temperament has been included in studies of children during their early years of development, such as the examination of the reciprocal interaction between parenting behaviors and attributes of the infant (Maccoby, Snow & Jacklin, 1984), or how temperament is linked to the quality of sibling relationships, as discussed above. However, temperament has been largely ignored (with the exception of Lerner and her colleagues - Lerner, 1983; Nitz, Lerner, Lerner, & Talwar, 1988 - work on the test of the "goodness of fit" model) in studies of later points in development such as adolescence (Bronfenbrenner, Kessel, Kessen & White, 1986).

Socio-cognitive characteristics

Several studies (Dunn et al., 1991; Howe & Ross, 1990; Light, 1979) that have investigated how the sibling relationship is linked to socio-cognitive skills (e.g. role-taking ability) of children, assumed the direction of influence to flow from the sibling relationship to the socio-cognitive development of the child. However, these researchers recognized that this could not be proven since they conducted a correlational study, and that the path of influence was most likely bidirectional. Thus, a child who is more socially competent, who has a greater ability to take the perspective of another child, will probably be more likely to demonstrate this with their sibling, thus fostering a more positive relationship.

To date there has not been a study that has investigated how differing socio-cognitive skills that each child possesses can affect how he or she interacts with

siblings. More research is needed to uncover the direction of influence between a child's socio-cognitive skills and the quality of his or her sibling relationship.

Summary of the Determinants of the Quality of Sibling Relationship

The research reviewed indicates that various factors such as family structure variables, the parent-child relationship, and the characteristics of the individual children all can play a role in determining the quality of the sibling relationships. The range of the quality of the relationship between siblings can vary greatly depending on the connections and interplay between these different factors. As Furman and Buhrmester (1985a) point out, brothers and sisters "can be close or distant, harmonious or conflicted, cooperative or competitive." Because there exists such different relationships, there are several interesting questions that naturally follow. What are the consequences of these contrasting relationships? How are children who experience conflictual sibling relationships affected regarding their social development? Do sibling relationships in childhood remain as close, or as conflictual later on in adolescence? Examining the sibling relationship itself is needed to understand and assess its influences on a child's development. This leads into a discussion on studies that have investigated this link.

Influences of the Sibling Relationship

Research that has not focused on the determinants of the quality of sibling relationships has focused on the influences of, or potential "outcomes", linked to this relationship. Outcomes that have been linked to sibling relationships are also recognized to be determinants of the relationship. The term "outcome" is used when looking at a child's development at one point in time. The current researcher

recognizes that when examining the development of a child across time, these factors that the sibling relationship seems to affect will reciprocate and also act as mutual influencers. Therefore, the word "outcome" will not be used in this present study since it implies an end point to a process. Most likely, pathways that connect the sibling relationship to child characteristics are bidirectional and do not ever stop influencing one another. The rest of the discussion will examine child factors, such as socio-cognitive skills and child functioning that are influenced by the sibling relationship.

Socio-cognitive development

Light (1979), in a study of four year old children and their siblings, found that the quality of the sibling relationship was associated with the development of socio-cognitive skills. Those children who experienced closer relationships with their siblings demonstrated significantly higher role-taking skills and were more socially sensitive than those children who did not experience close relationships with their siblings. Light's (1979) findings suggest that an optimal environment for the development of the socio-cognitive and communicative skills that is required in role-playing activities, is created by some sibling relationships.

Similarly, Stewart and Marvin (1984) found a link between preschoolers' development of perspective-taking abilities and friendly sibling relationships. When preschoolers and their infant siblings were left alone during a modified "strange situation" (Ainsworth, Blehar, Waters & Wall, 1978), the majority of preschoolers who enjoyed friendly relations with their siblings promptly comforted their distressed younger siblings, demonstrating their ability to understand and respond to another

person's needs. In Howe and Ross's (1990) study of preschoolers and their one-year old brothers and sisters, the friendlier siblings were towards one another, the more the older child would directly discuss feelings and thoughts with, and for the most part of, their younger siblings. This lends support to Light's (1979) and Stewart and Marvin's (1984) findings. Dunn & Munn (1986) have documented young children and their siblings showing "surprisingly mature powers of cooperation, sharing and comforting." The researchers conclude that the sibling relationship is one context in which very young children may learn to develop these capabilities of prosocial behavior.

More recently, researchers have reported that sibling dyads who show more cooperative behaviors with one another performed better on social cognition tasks than siblings who did not exhibit a cooperative relationship (Dunn et al., 1991). As with previous studies, the direction of effects was not clear. It is likely that cooperative sibling relationships, an awareness of other's needs, and a greater understanding of other children's thoughts, feelings, and actions are mutually influential.

We have seen that the quality of sibling relationships seems to affect the siblings themselves and the development of socio-cognitive skills. Evidence for these skills have been documented in studies of the interaction children and siblings. To take this further, one can ask whether any links exist between sibling relationships and another context besides the home, such as the child's relationships with his or her peers and/or friends. Berndt and Bulleit's (1985) study of preschoolers and their peers did not find many relationships between child and sibling interaction and child

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and peer interaction. Stocker and Dunn (1990) also did not find associations between sibling relationships and peer relationships. However, they narrowed the child's peer group further and looked at the child's friends. Here the researchers found a connection. The children who were observed and reported to have hostile relationships with their sibling experienced more positive friendships (as reported by the mother), and closer friendships (as reported by the children themselves). Stocker and Dunn offer an explanation for this negative correlation between the sibling relationship and the child's friendships. They speculate that children who are in conflictual relationships with their siblings may compensate for this by developing closer relationships with their friends.

The few studies that have addressed the question of whether the child-sibling relationship has an impact on extrafamilial relationships indicates that it does seem to have an influence on the children's friendships, but not with peer interaction. The influence of a sibling on a child appears to extend further outside of the sibling relationship, outside of the family, and into the relationships the child has with his or her friends. More research is needed to clarify the nature of these connections.

Child functioning

Several researchers have argued that sibling conflict may act as a "training ground for the development and maintenance of aggression," (Patterson, 1986, Patterson, Dishion & Bank, 1984). Other researchers have examined the extreme of sibling conflict - that of sibling abuse (Graham-Bermann, Cutler, Litzenberger, & Schwartz, 1994). These researchers reported a negative lasting effect of sibling violence in the early childhood years on emotional well-being as young adults. Based

on these studies, it appears as if an extremely conflictual sibling relationship can undermine later child functioning.

Poor sibling relationships of 3-4 year old boys have been reported to be correlated with "antisocial and disturbed behavior" several years later when the children were 8 years of age (Richman, Stevenson, & Graham, 1982). Investigating adjustment differences within pairs of adolescent siblings, researchers found that perceptions of the sibling relationship by the adolescent's parents and teachers, as well as the adolescent's themselves, are associated with certain aspects of the adolescent's child functioning (Daniels et al., 1985). For example, there was a negative correlation between a teacher's report of the disobedience of the adolescent and the adolescent's friendliness in his or her sibling relationship. Similarly, parents who perceived their adolescent as more disobedient perceived the adolescent-sibling relationship as less friendly. Adolescents who perceived themselves as more delinquent were also reported to experience a less friendly relationship with their sibling. The researchers concluded that the different experiences of siblings related to their emotional adjustment. As has been documented in adolescence, however, "normal" levels of sibling conflict may also fulfill a more positive function, that of encouraging an understanding of individuality and resolving conflict (Raffaelli, 1992). Thus, whether a poor, conflictual relationship with a sibling will lead to later difficulties in child functioning, may depend on the level of conflict.

Overview of the Literature

There are a myriad of factors that can undermine or enhance the quality of the sibling relationship. Examining these various factors, along with the sibling

relationship itself, can illuminate the process of these reciprocal influences. The quality of the sibling relationship has been linked to the development of socio-cognitive skills, aggression, and to child functioning. Evidence for the existence of these connections should encourage researchers to investigate further the nature of these relationships.

The Current Study

There are several aims to this study. The first is to examine the bidirectional paths of influence between the quality of sibling relationships and the primary determinants of the relationship. Secondly, this study will investigate whether the resulting differences in sibling relationships lead to certain child characteristics. Lastly, this study will examine how the sibling relationship changes across time. Hopefully, this study will shed more light on the sibling relationship during this later point in life (adolescence), and also help clarify the developmental trend of the sibling relationship.

This study is unique in that it examines the sibling relationship from childhood to adolescence. Previous research has, at most, looked at the relationship within a span of five years. Also, this study attempts to incorporate the determinants of the sibling relationship to see how they are linked to the relationship itself, and, in addition, how they are linked to certain child characteristics. Previous investigations of the sibling relationship has focused solely on one side of this process. In other words, these studies have either examined the influences on the quality of the relationship, or have examined certain developmental outcomes related to the

relationship. More specific predictions are detailed in the hypotheses on pages 65 - 66.

CHAPTER III

METHOD

Figure 2 illustrates the research models to be used in the present study. Due to the archival nature of the data set being examined, the research models cannot include all the variables of the theoretical model. These models are comprised of three primary determinants of the siblings relationship: 1) family structure variables, 2) quality of the parent-child relationship, and 3) child characteristics. The pathway between sibling relationships and the quality of the parent-child relationship, and child characteristics, reciprocally influence one another. This is represented by the bidirectional arrows linking these variables. Family structural variables, on the other hand, can only influence and not be influenced by other factors, thus there is a unidirectional arrow representing the connections.

Sample

The sample includes 83 two-parent families drawn from the "core sample" of the New York Longitudinal Study (NYLS) (Thomas & Chess, 1977). The sample has been followed since 1956, beginning in early infancy, to their young adulthood. The families are predominantly of Caucasian background, are middle- or upper-middle socioeconomic status, and are well educated (40% of the mothers and 60% of the fathers had both college educations and postgraduate degrees, and fewer than 10% had no college education at all). The attrition rate for this sample has been extremely low; of the 136 subjects that started, 133 still remain active participants. Two time periods during the lifespan will be examined - when the children

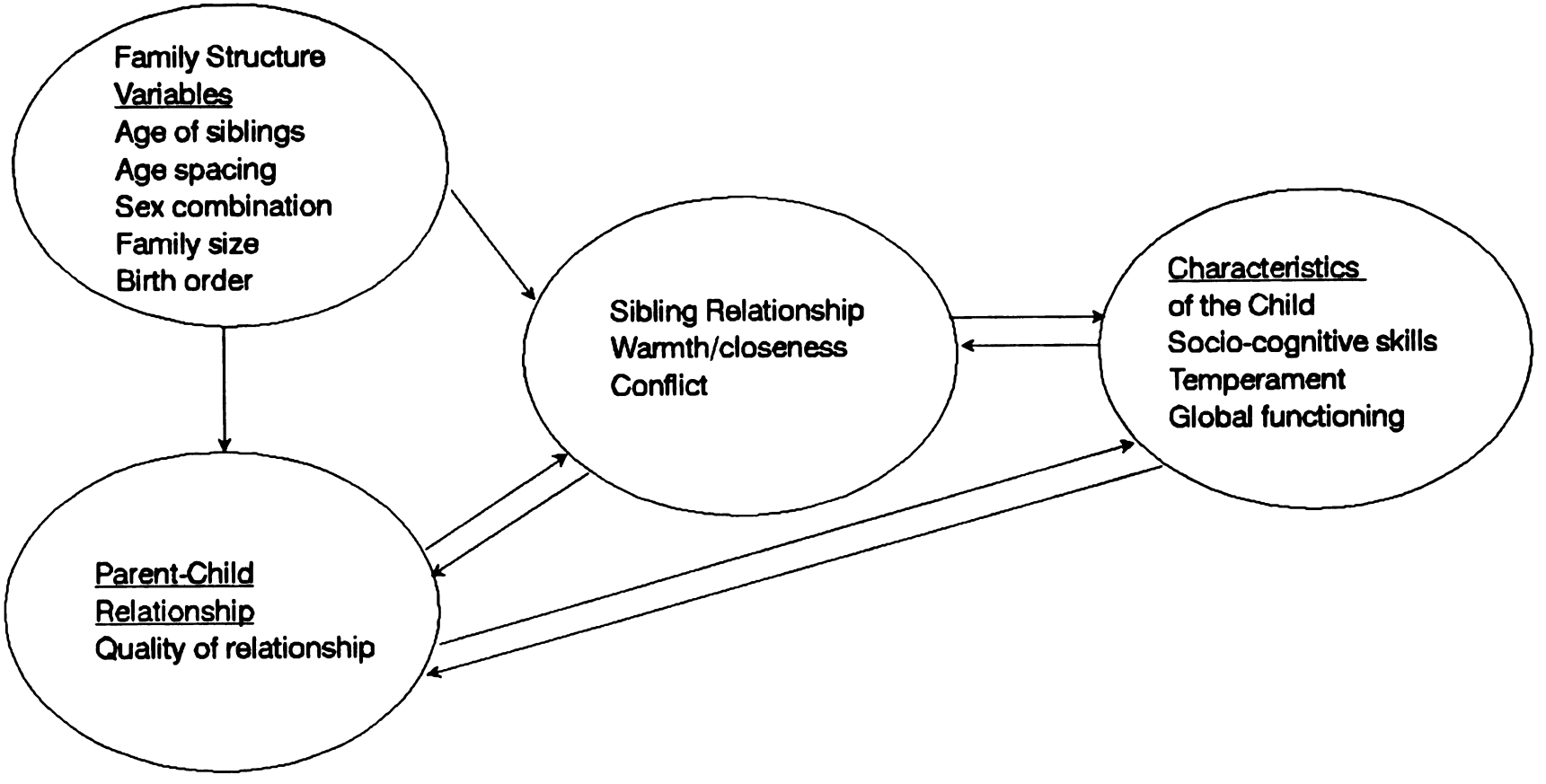

Figure 2. Research model of sibling relationships at age 3 and adolescence

were of preschool age, and when they were adolescents. There are 83 children (38 males and 45 females) who had siblings both during preschool and adolescence. Preschool data were collected when the children were three years of age. Adolescent data were collected when the participants were 14-17 years of age. Only 107 adolescents were interviewed. Adolescents without siblings, and those cases with more than 50% missing data were eliminated, leaving a total of 83 cases. The number of siblings that the children in this study have varies. Therefore, if the child had more than one sibling, only one sibling was randomly chosen for the analyses.

In order to investigate these relationships, a longitudinal design will be employed, because "longitudinal research, especially when it is of sufficient duration and contextual sensitivity, may be particularly suited to appraise dynamic interactions in the biological, psychological, and social domains," (Baltes, Reese, & Nesselroade, 1977). Likewise, Lerner and Lerner (1989) state that "only when such studies are multilevel ones, wherein both contextual and individual variables are assessed repeatedly, can links between changes in the person and his or her social world be ascertained." If the sibling relationship is examined longitudinally, the direction of effects may become clearer.

Procedure for Data Collection

The methods used in the NYLS have been explained in detail elsewhere (Chess & Thomas, 1984; Thomas & Chess, 1977; Thomas, Chess & Birch, 1968). Very briefly, parents were interviewed periodically (about every three months) regarding the behaviors and functioning of their children beginning in the child's first month of infancy, for the first two to three years. When the children reached adolescence,

they, along with their parents, were interviewed on "various aspects of the adolescents' personal and interpersonal functioning."

Measures

Family structure variables

Data on the family structure variables were gathered through the parental interview for the three-year assessment and from the adolescent interview for the adolescent. The range, mean and standard deviations for the family structure variables are listed in Table 1.

Parent-child relationship

Parent-child relationship. To measure the quality and characteristics of the parent-child relationship, parents were interviewed when the children were three years of age regarding child-rearing issues and relationships with their children. Because mothers and fathers gave such similar responses, only the mother's responses were coded. The interview covered parenting topics such as "the degree of parental conflict and tension; the degree of warmth, protectiveness, and permissiveness directed toward the child; and the degree and forms of discipline employed." Transcriptions of these interviewers were then coded by raters. Cameron (1977) then selected 70 items that were related to issues of parenting and entered them into a cluster analysis using the Tryon and Bailey (1966) system. The 70-item matrix formed eight oblique dimensions of parenting:

Dimension 1: Parental disapproval, intolerance, and rejection

Dimension 2: Parental conflict regarding child rearing

Table 1

Descriptive Statistics for Family Structure Variables

		Year 3 and Adolescence		
		M	SD	Range
Birth Order		2.02	.78	1 - 4
Family Size*		2.54	.72	2 - 5
Age Spacing		3.13	2.68	0 - 14
		m-m**	f-f	m-f
Sex combination	N =	20	24	30

*Family size during adolescence (M = 2.98, SD = .92, Range = 2 - 5)
**m = male, f = female

Dimension 3: Parental strictness vs. permissiveness

Dimension 4: Maternal concern and protectiveness

Dimension 5: Depressed living standards

Dimension 6: Limitations on the child's material supports

Dimension 7: Inconsistent parental discipline

Dimension 8: Large family orientation

Several studies have validated the use of these parent ratings. Cameron's study (1977) found a relationship between parental rejection, parental conflict regarding child-rearing, maternal inconsistency, and maternal acceptance with a child's temperament and risk for behavioral problems. Other research using these parent ratings (Lerner & Galambos, 1985; Vicary & Lerner, 1986) have also related these measures to maternal role satisfaction, child temperament, and adolescent drug use. Thus, these ratings seem to be a valid measure of these aspects of parenting. Not all dimensions will be utilized in assessing the quality of the parent-child relationship. The following will describe the dimensions chosen in more detail.

Dimension 1, labeled the *rejection cluster*, is made up of six items regarding parental disapproval and rejection. Parents with a high score indicates a low tolerance, little feeling, and a bias against the child. They are more frequently described by the interviewer as being "cold and detached". In addition, these parents seemed to prefer the other children in the family to the study child. These scores ranged from 38 to 78, $\underline{M} = 50.15$ and $\underline{SD} = 9.34$.

Dimension 2 is the *parental conflict cluster*, and is made up of six items regarding the degree of disagreement, conflict or confusion between parents regarding

how to parent the child. Higher scores indicate higher conflict between parents. These high conflict parents also express low levels of confidence in their abilities as parents. These scores ranged from 35 to 71, M = 51.57 and SD = 10.17.

Dimension 3, the *strictness cluster*, is made up of three items regarding parental permissiveness and discipline. A high score on this factor indicates strict discipline is enforced with the child. These scores ranged from 33 to 77, M = 50.33 and SD = 10.03.

Dimension 4, is the *maternal concern* cluster that is made up of six items regarding the level of support shown by the mother. Those with high scores on this dimension are very concerned with their child's safety and spend considerable time within the home in supporting, protecting, and working for their children. These scores ranged from 36 to 76, M = 50.55, and SD = 9.67.

Dimension 7, representing the *inconsistent cluster*, is made up of two items that reflect the inconsistency with which a child is disciplined. Parents with high scores in this cluster have a higher pattern of inconsistency in the disciplining of their children. There is a higher frequency of issues in the home pertaining to child discipline, and a higher number of conflicts that can arise around these issues of discipline. These scores ranged from 40 to 92, M= 49.54 and SD = 9.51.

The following explains why certain dimensions will not be included in this current study. Dimension 5, the *depressed living standard cluster*, will not be used. Perhaps because the sample is so homogenous, with such a low variability in the high living standards, this cluster would not be very useful as a predictor for certain variables such as the quality of the parent-child relationship. This cluster does not

seem to be a very good predictor for another variable, children's temperament. Cameron (1977) found this cluster to have "scattered" correlations with temperament. Dimensions 6, the *material support limitations* cluster, will also not be included in the present study. Dimensions 6 and 5 were significantly correlated (.37). Similar to the depressed living standard cluster, the material support limitations cluster may not have sufficient variability to accurately demonstrate its relationships with certain variables.

Dimension 8 (*large family orientation*) will not be incorporated in this study. Cameron (1977) did not find a greater number of significant correlations with dimensions 6 and 8 and children's temperament than would be expected by chance. He concludes that the reliability and validity of the items comprising these two clusters were questionable.

Parent-adolescent relationship. This was assessed through the parent and adolescent interviews. Tubman and Lerner (1994a, 1994b) content analyzed all of the parent and adolescent interviews for statements regarding two aspects of the parent-adolescent relationship: the emotional quality and the interactional quantity of the relationship. They came up with 7912 statements from the interview. Raters (between five and ten were used, based on availability) coded statements on each of these two dimensions. The statements on emotional quality (e.g., closeness or distance, love or hate, conflict, tension) were rated on a three-point scale, positive (3), mixed, variable, ambivalent or neutral (2), and negative (1). Statements on the interactional quantity (e.g., giving advice, sharing problems, expressing feeling, performing joint activities) were rated as high (3), medium (2), and low (1). Scores were then given for each adolescent and his or her parent on the two dimensions of affective

experiences between the parent and the adolescent. These scores were created by "averaging across raters for each statement and then averaging across statements in the two affective experience dimensions". A high score represented a good relationship, a low score a more negative one. Inter-rater reliability was 89.6% for emotional quality and 88.2% for interaction quantity for 20% of the sample of statements that were randomly selected. Table 2 shows the means and standard deviations for twelve the parenting indicators.

Temperament

Child Temperament. Thomas and Chess (1977) have delineated nine dimensions of temperament. These dimensions have been assessed through parental interviews and questionnaires. Parents were specifically asked about their child's activity level, rhythmicity, approach/withdrawal, adaptability, threshold of responsiveness, intensity of reaction, quality of mood, distractibility, and attention span/persistence. Thomas and Chess (1977) rated the children on a three-point scale (1 = low, 2 = moderate, 3 = high) on the frequency and intensity of these dimensions which resulted in temperament scores for each child. The validity and usefulness of these ratings have been documented in many studies involving the NYLS data set (e.g. Chess & Thomas, 1984; Lerner, Hertzog, Hooker, Hassibi & Thomas, 1988; Thomas et al., 1968).

Along with the nine dimension scores, a difficulty score was also given. A high score corresponded to a child with a difficult temperament, while a low score corresponded to a child with an easy temperament. A temperamentally difficult child was characterized as having low rhythmicity, low adaptability, withdrawal responses,

Table 2

Descriptive Statistics for the Adolescent Parenting Ratings

		M	SD
Interaction Quantity			
1.	Adolescent rating father	1.62	.45
2.	Adolescent rating mother	1.74	.49
3.	Adolescent rating parents	1.90	.35
4.	Father rating adolescent	1.80	.63
5.	Mother rating adolescent	1.71	.38
6.	Parents rating adolescent	1.83	.43
Emotional Quality			
7.	Adolescent rating mother	2.01	.59
8.	Adolescent rating father	2.05	.66
9.	Adolescent rating parents	2.15	.44
10.	Father rating adolescent	2.05	.61
11.	Mother rating adolescent	1.95	.46
12.	Parents rating adolescent	1.97	.47

negative mood, and high intensity of reactions (Thomas & Chess, 1977). Each child's "difficulty" score was comprised of these five aspects of temperament. The reliability and validity of these temperament scores have been reported in detail elsewhere (Thomas et. al., 1963; Thomas & Chess, 1977). Briefly, studies have found the difficultness of a child's temperament to be predictive of later adjustment problems such as drug use (Lerner & Vicary, 1984), behavior problems (Chess & Thomas, 1984; Thomas et al., 1968) and psychiatric disorders (Thomas, 1976). Therefore, the difficultly temperament scores will be used in this present study. The scores ranged from -.28 to 4.13, $\underline{M}$ = 1.76, $\underline{SD}$ = .86, standardized alpha = .61.

Adolescent temperament. Temperament was assessed through the adolescent interview. Adolescents were rated on the nine dimensions of temperament as described earlier. As with the children's temperament ratings, a "difficulty score" was given to each adolescent. A low score corresponded to a more difficult temperament. The scores ranged from -23 to -4, $\underline{M}$ = -14.43 , $\underline{SD}$ = 4.14, standardized alpha = .62.

Relationship with siblings

Child-sibling relationship. From the interviews, statements regarding the child's relationships with his or her siblings were coded in the Preschool Behavioral Adjustment Rating Scale. The three items that assessed the child's relationship with their sibling were: Child quarrels with, hurts or bullies sibling, Child is intimidated by or expresses dislike of sibling, and Child expresses preoccupation with sibling. An example of this last item is: "Wants to play and be with sister all the time. Is much more aggressive with sister than anyone else in the family or out. Asks for

sister when she's in school. Increased rivalry with sister over parents," (taken from Preschool Behavioral Adjustment manual, #1). There were no "positive" items since the purpose of the Behavioral Adjustment Scale was to assess whether the child was experiencing any behavioral problems. These items were rated from 1 = insignificant to 5 = severe. Ratings were summed across items, and a higher score indicated a more negative relationship. The scores ranged from 1.0 to 2.5, M = 1.27, SD = .46.

Adolescent-sibling relationship. The relationship an adolescent shared with their sibling was assessed through interviews with the adolescent and with their parents. The interview included a question that asked them to describe their relationship with their sibling. Responses were extracted from the interviews and were coded on a scale of 1 to 5: 1 = very positive, 2 = somewhat positive, 3 = neutral or ambivalent, 4 = somewhat negative, and 5 = very negative. Inter-rater agreement was 88% for two raters on 20 randomly chosen interviews. The scores ranged from 1 to 5, M = 3.56, SD = .95 for the adolescent rating. For the parent rating the scores ranged from 1 to 5, M = 3.62, SD = .98.

Socio-cognitive skills

Child socio-cognitive skills. As with the above mentioned variables, the parent interview was coded into the Preschool Behavioral Adjustment Rating Scale. To assess the child's socio-cognitive skills, the "nonfamily relationships" subscale, consisting of seven items, were coded pertaining to the child's interactions with nonfamily members. An example is, "Child is aggressive and bossy with playmates." Items were scored from 1 = insignificant to 5 = severe. The ratings for the seven

items were summed and averaged. A lower score indicates the child possesses higher socio-cognitive skills. The M = 1.19, SD = .26.

Adolescent socio-cognitive skills. This was assessed through the adolescent interview where questions about the relationship with their peer group were examined. To obtain socio-cognitive skill ratings, raters read through all relevant interview material for each subject and evaluated the statements regarding social functioning. Then, the raters assigned a summary score that ranged from 1 = poor to 7 = excellent. Thus, a higher score indicated the adolescent had higher socio-cognitive skills. The M = 4.38, SD = 1.73.

Child functioning

Child functioning. The three year-old child's functioning was assessed by examining the parental interviews which covered behavioral functioning topics: sleeping, eating, elimination, sex, fears, speech, motor behavior, relationships with parents, discipline, relationships with siblings, relationships outside the family, coping, and parental attitudes towards the child. A coding protocol was developed by Thomas and Chess and colleagues to rate the children (1 = insignificant to 5 = severe) in various aspects of their development. By doing so, they were able to identify children who were experiencing difficulties functioning. Interrater reliabilities (intraclass correlations) for these ratings ranged from .34 to .98 (average r = .72). Using the scores from the above mentioned categories (except for sex and parental attitudes)[4],

[4]Sex was not included in the calculation because the items did not differentiate levels of adjustment. For example, the items scores for curiosity, masturbation, and sex preference did not necessarily reflect a difference in level of adjustment, except for a rare extreme position. Parental attitudes was not included because the items referred to the parents and not to the child.

an overall, or global, child functioning score was calculated by summing up the score for each category and dividing by the number of categories with scores. For those records where there was more than one rater, the raters' scores were averaged. Thus, a higher number indicated a poorer level of adjustment. The M = 1.36, SD = .20.

Adolescent functioning. In adolescence, interviews were also conducted with the adolescents themselves. The categories discussed pertaining to their psychological functioning were: self-evaluation, family relationships, school functioning, sexual functioning, social functioning, goals, implementation of goals, coping patterns, person orientation, task orientation, communication, and emotional expressiveness. In each of these areas, adolescents were rated on a 7-point scale (1 = poor to 7 = excellent). Twenty subjects were selected at random and used to check inter-rater reliability. Using these 20 subjects, a .93 coefficient of agreement on the ratings was achieved for the two raters. As with the child interview, raters examined the adolescent interview and indicated if the subject was experiencing any problems and if so, the severity of the problem (e.g. Thomas et al., 1963, 1968). An adolescent functioning score was also computed by summing up the category scores and dividing by the number of categories. A higher number would indicate a higher level of adjustment. The M = 5.49, SD = 1.59, standardized alpha = .89.

Hypotheses

The data will be analyzed to determine whether the proposed model of sibling relationships can be supported. Based on the above literature, it is hypothesized that both family structure variables and the quality of the parent-child relationship will be

correlated to the quality of the sibling relationship, and that the quality of the sibling relationship will mediate the effect of family structure variables and partially mediate the effect of the parent-child relationship on child characteristics.

More specific hypotheses:

Regarding family structure variables and the sibling relationship:

H1: Adolescent children will experience less conflictual relationships with their siblings compared to preschool children.

H2: Male siblings pairs will be more conflictual than female sibling pairs.

H3: Children with the same-sex sibling will have warmer and closer relationships than mixed-sex siblings.

H4: Later born siblings will perceive a more positive relationship with their siblings in childhood and adolescence than first born siblings.

H5: Children who are more widely spaced from their sibling will experience more positive sibling relationships.

H6: Children with a larger family size (at least four children in the family) will experience a more negative relationship with their siblings than those from smaller family sizes (two or three children in the family).

Regarding the parent-child relationship and the sibling relationship:

H7: Sibling relationships will not be as positive for children of parents who ignore them as compared to children of parents who show warmth and respond to their needs.

Regarding child characteristics and the sibling relationship:

H8: Children who are characterized as having an easy temperament will be more likely to experience a warmer and closer relationship with their sibling than those children characterized by difficult temperaments.

H9: Children who have warmer and closer sibling relationships will score higher on socio-cognitive skills and child functioning measures.

Continuity of the sibling relationship:

H10: The preschool measures of the quality parent-child relationship and the three child characteristics - temperament, socio-cognitive skills, and child functioning will predict the quality of the adolescent sibling relationship.

The hypotheses stated above have been based on literature that has assumed the effects of variables to flow in one direction.

H11: The variables considered (with the exception of family structure variables) will have bidirectional influences on one another.

CHAPTER IV

RESULTS

The purpose of this study was to examine how family structure variables (e.g., birth order and family size), the quality of the parent-child relationship, and certain child characteristics influenced the quality of the child's relationship with his or her sibling at two time periods - when the child was three years of age, and during adolescence. Furthermore, since the current study was longitudinal, it was possible to investigate whether the quality of relationships between siblings would change from childhood through adolescence, and whether the same variables would be equally as influential to the sibling relationship at these two time periods.

Intercorrelations Among Variables

To assess the relationships between family structure, child characteristics, the quality of parent-child relationship and the quality of the sibling relationships, correlations were calculated. As can be seen in Table 3, there were several significant correlations, one from each domain of the determinants of sibling relationships.

Additional correlations were calculated to examine whether there were any sex differences in the relationships between family structure variables, quality of the parent-child relationship, child characteristics, and the quality of the sibling relationship. Table 4 shows that only two sex differences emerged. Tables 5 and 6 display correlations between the variables of interest during adolescence. As can be seen from the tables, birth order was the only variable that was significantly correlated with the quality of sibling relationships at both age three and adolescence.

Table 3

Correlations between the Determinants and the Quality of Sibling Relationship at Age 3.

	Correlation Coefficient with Quality of Sibling Relationship
Family structure variables	
Sex of sibling pairs	-.13
Sex combination of sibling pairs	-.11
Birth order	-.30*
Age spacing	.01
Family size	.01
Parent-child relationship	
Parental disapproval, intolerance, and rejection	-.02
Parental conflict regarding child rearing	-.01
Parental strictness vs. permissiveness	.14
Maternal concern and protectiveness	.28*
Inconsistent parental discipline	.16
Child characteristics	
Difficult temperament	.11
Socio-cognitive skills	.12
Child functioning	.37*

*$p < .01$

Table 4

Correlations Between the Determinants and the Quality of the Sibling Relationship at Age 3 by Sex.

	Correlation coefficient with quality of sibling relationship	
	Boys	Girls
Family structure variables		
Sex combination of sibling pairs	-.13	-.08
Birth order	-.40*	-.13
Age spacing	-.05	.02
Family size	-.02	.05
Parent-child relationship		
Parental disapproval, intolerance, and rejection	-.07	.05
Parental conflict regarding child rearing	.02	-.16
Parental strictness vs. permissiveness	.15	.21
Maternal concern and protectiveness	.29	.17
Inconsistent parental discipline	.24	.05
Child characteristics		
Difficult temperament	.28	-.00
Socio-cognitive skills	.12	.15
Child Functioning	.31	.38*

*$p < .05$

Table 5

Correlations Between the Determinants and Quality of Sibling Relationship During Adolescence.

	Correlation Coefficient with Quality of Sibling Relationship	
	Adolescent rating	Parent rating
Family structure variables		
Sex of sibling pairs	.06	-.01
Sex combination of sibling pairs	-.14	.16
Birth order	.18	.35*
Age spacing	-.06	-.01
Family size	-.01	-.17
Parent-adolescent relationship		
Adolescent rating father - interaction quantity	-.06	-.14
Adolescent rating mother - interaction quantity	.24*	.25*
Adolescent rating parents - interaction quantity	.18	.18
Father rating adolescent - interaction quantity	-.14	-.20
Mother rating adolescent - interaction quantity	.00	-.06
Parent rating adolescent - interaction quantity	.08	.04
Adolescent rating mother - emotional quality	.21	.17
Adolescent rating father - emotional quality	.02	-.12
Adolescent rating parents - emotional quality	.05	.16
Father rating adolescent - emotional quality	.04	.01
Mother rating adolescent - emotional quality	-.02	.21
Parents rating adolescent - emotional quality	.04	.07
Adolescent characteristics		
Difficult temperament	-.12	-.07
Socio-cognitive skills	.24*	.22
Child functioning	.14	.16

*$p < .05$

Table 6

Correlations Between Determinants and Quality of Sibling Relationships During Adolescence by Sex

	Boys		Girls	
	Adolescent rating	Parent rating	Adolescent rating	Parent rating
Family structure variables				
Sex combination of sibling pairs	-.13	.18	.00	.15
Birth order	.25	.22	.14	.43*
Age spacing	-.17	-.18	.00	.10
Family size	-.09	-.25	.04	-.13
Parent-adolescent relationship				
Adolescent rating father - interaction quantity	-.06	-.34	-.06	-.07
Adolescent rating mother - interaction quantity	.30	.38*	.21	.17
Adolescent rating parents - interaction quantity	.14	.18	.20	.18
Father rating adolescent - interaction quantity	.19	.23	-.29	.45*
Mother rating adolescent - interaction quantity	-.05	-.01	.02	.11
Parent rating adolescent - interaction quantity	.22	.20	.02	-.07
Adolescent rating mother - emotional quality	.14	.31	.25	.09
Adolescent rating father - emotional quality	.22	-.21	-.05	-.11
Adolescent rating parents - emotional quality	-.15	.02	.14	.24
Father rating adolescent - emotional quality	.09	.10	.02	-.05
Mother rating adolescent - emotional quality	-.05	.17	.05	.27
Parents rating adolescent - emotional quality	.16	.15	.03	.00

*$p < .05$

Table 6 (cont'd)

Adolescent characteristics		
Difficult temperament	-.01	.26
Socio-cognitive skills	.09	-.06
Child functioning	.21	.03

During adolescence, adolescent functioning was no longer significantly correlated with the relationship quality with siblings. Instead, socio-cognitive skills emerged as being significant. As with the correlations at age three, during adolescence there were certain aspects of parenting that significantly related to an adolescent's relationship with his or her sibling. The adolescent and parent rating of the quality of sibling relationship were significantly positively correlated with one another ($r=.61$, $p<.001$).

Family Structure Variables and the Sibling Relationship

The one way ANOVA procedure was used to analyze how the quality of sibling relationships differed with variations in family structure variables. At age three, differences in only one of the family structure variables - birth order - was significantly associated with the differences in the relationships between siblings. Later borns were more likely to experience a more positive relationship with their sibling compared to first borns at age three ($F(1,80)=9.04$, $p<.01$) and adolescence according to the adolescent rating ($F(1,75)=7.94$, $p<.01$) as well as the parental rating ($F(1,70)=11.50$, $p<.01$).

When differences in birth order and quality of sibling relationship for boys and girls were looked at separately, it was found that the birth order variable was significant for boys ($F(1,30)=5.81$, $p<.05$),but not for girls at age 3. The analyses revealed that there was a sex difference in birth order differences on sibling relationships in adolescence as well (see Table 7). For girls but not for boys, those who were later born had more positive relationships with their siblings than first borns.

Table 7

Birth Order Main Effect on the Sibling Relationship for Boys and Girls During Adolescence.

Parent rating of the sibling relationship

	Boys N=31		Girls N=41	
	M	SD	M	SD
First born	3.20	1.16	2.50	1.10
Later born	3.81	.68	3.83	.94
	$F(1,29)=3.42$, $p<.08$		$F(1,39)=9.80$, $p<.01$	

Adolescent rating of the sibling relationship

	Boys N=34		Girls N=43	
	M	SD	M	SD
First born	3.46	.92	2.36	.90
Later born	3.52	.63	3.86	.98
	$F(1,32)=.06$, $p<.81$		$F(1,41)=14.24$, $p<.001$	

Parent-child Relationship and the Sibling Relationship

Multiple regression was used to assess whether the quality of the parent-child relationship had any effect on the sibling relationship. There were five parentingpredictors in the equation: parental conflict, maternal concern, parental inconsistency in discipline, parental rejection, and parental strictness. Variables were entered simultaneously since there was no a priori theory as to the relative importance of each variable. It was found that at age three, only one dimension of parenting significantly predicted sibling problems. Those children who had more problems with their sibling had mothers who were more concerned about their children (Beta=.29, $t=2.60$, $p<.05$). Those mothers who were more concerned spent more time with their children, and invested more time regarding the health and safety of their children. There were no sex differences in how well certain parenting dimensions predicted the sibling relationship at age 3.

To examine how the parent-adolescent relationship related to the quality of sibling relationships during adolescence, the interactional quantity and the emotional quality of the parent-adolescent relationship were used as predictors of the adolescents relationship with their brother or sister. In all, there were twelve indicators of the quality of the relationship between the adolescent and their parents - with each person rating the other (the adolescent rated the relationship with the mother, father, and parents together, and the mother, father, and parents together rated the relationship with the adolescent) on the two above mentioned dimensions.

Multiple regression was used to analyze these relationships. Separate regressions were run, with each group of these variables in the regression equation: 1)

the adolescent rating of the amount of interaction in the relationship with their parents, 2) the parents' ratings of the amount of interaction in the relationship with their adolescent , 3) the adolescent rating of the emotional quality of the relationship with their parents, and 4) the parents' ratings of the emotional quality of the relationship

with their adolescent. The variables were entered simultaneously since there was no a priori theory as to which ratings were be the best predictor of the parent-adolescent relationship. In addition, these equations were run using the adolescent as well as the parent rating of the quality of sibling relationship.

The analyses indicated that only one of the parent-adolescent relationship ratings significantly predicted the quality of sibling relationships using the adolescent rating of sibling relationship. When the father reported a higher quantity of interaction with his adolescent, the adolescent experienced a less positive sibling relationship, as rated by both parents (Beta=-.29, t=-2.06, p<.05). Further analyses were conducted to examine these findings more closely. Several sex differences were found. Female, but not male, adolescents who had more interaction with their father (as rated by their father) had more negative sibling relationships, with both the adolescent rating (Beta=-.46 , t=-2.31, p<.05) and parent rating (Beta=-.61, t=3.36, p<.01). For males, when they rated the emotional quality of their relationship with their mother as being positive, they also had a more positive sibling relationship, using the parental rating (Beta = .45, t=2.17, p<.05).

Child Characteristics and the Sibling Relationship

Using linear regression, it was found that difficult temperament did not significantly affect the quality of sibling relationships at either age three or adolescence. However, the quality of sibling relationships at age three predicted the child functioning variable (Beta=.37, t=3.52, p<.001). When this was tested for boys and girls separately, the results show that the sibling relationship variable significantly predicted child functioning for girls (Beta=.38, t=2.70, p<.001), but not for boys.

Results revealed that the quality of sibling relationship (as rated by the adolescent) significantly predicted only one adolescent characteristic - socio-cognitive skills (Beta=.24, t=2.12, p < .05). When males and females were separated, it was found that for females, but not for males, the quality of sibling relationship (as rated by the adolescent and parent) significantly predicted socio-cognitive skills (Beta=.31, t=2.07, p<.05 - adolescent rating) (Beta=.38, t=2.57, p<.05 - parent rating). Adolescents with better sibling relationships had higher socio-cognitive skills.

Predicting the Adolescent Sibling Relationship from Year 3

Sibling problems at age three and quality of adolescent sibling relationships were not significantly correlated. Using multiple regression, difficult temperament, socio-cognitive skills and child functioning at three years old did not significantly predict the adolescent sibling relationship, as rated by the adolescent or by the parent. Separating males and females also revealed nonsignificant predictions of child characteristics at age three and later relationships with siblings.

Quality of Sibling Relationship at Age Three and Adolescence

It was difficult to assess whether the quality of sibling relationships at the two time periods differed from one another because two difference measures were used. Over 60% of parents rated sibling problems at year three to be insignificant. It is unclear as to whether that meant the relationship was positive. Approximately 8% of the parents rated their children as experiencing sibling conflict occasionally, about 5% reported problems frequently. During adolescence, 35% of the adolescents and 17% of the parents rated the sibling relationship as being ambivalent or neutral. Twelve percent (adolescent rating) and 19% (parent rating) reported a negative relationship, and 45% (adolescent rating) and 51% (parent rating) reported a positive relationship. A chi-square independence test of these two variables indicated that the sibling relationships at year three and adolescence are independent of one another.

Bidirectionality of Relationships

LISREL (Joreskog & Sorbom, 1981) was used to assess whether the variables considered (with the family structure variables) exerted bidirectional influences on one another. Unfortunately, the original model which predicted bidirectional influences was not successful. When the model was defined with bidirectional paths between variables, the model failed. The sample size was too small and there was not enough power to estimate all the parameters. The analyses were not stopped here, instead, unidirectional paths were tested since the data appeared to drive the model in this direction. Therefore, a much simpler model of sibling relationships was tested, with no estimation of reciprocal influences between variables.

Parameters for the LISREL Run

Figures 3 and 4 show the final LISREL models of sibling relationships. Tables 8 and 9 show the means and standard deviations for the measures used in the LISREL analyses. The covariance matrix of variables at both time periods was chosen to be analyzed (see Tables 10 and 11), because of various problems (e.g., incorrect computation of standard errors, chi-square and other goodness of fit measures) that may be encountered in using the correlation matrix for analyses (see Joreskog & Sorbom, 1988). Since LISREL cannot analyze raw data with missing values, values were estimated using regression. Those cases that had more than 40% of the values missing were removed. To estimate the model parameters, the maximum likelihood method was used.

Model of Sibling Relationships at Year 3

The loading of the quality of sibling relationships was fixed to 1.00, given that this latent construct had only a single indicator. Each of the remaining latent constructs were defined by setting one of the factors loadings to 1.00 (family size for Family Structure, parental inconsistency for Quality of Parent-Child Relationship, and child functioning for Child Characteristics).

Model fit

When the model of sibling relationships at year three was initially run, the goodness of fit indices revealed that the data did not fit the model well. The chi-square with 46 degrees of freedom = 95.17 (p=.00). Other goodness of fit measures also indicated a poor fit. The Goodness of Fit Index (GFI) = .85, the Root Mean Square Residual (RMSR) = 1.87, the Comparative Fit Index (CFI) = .90, and the

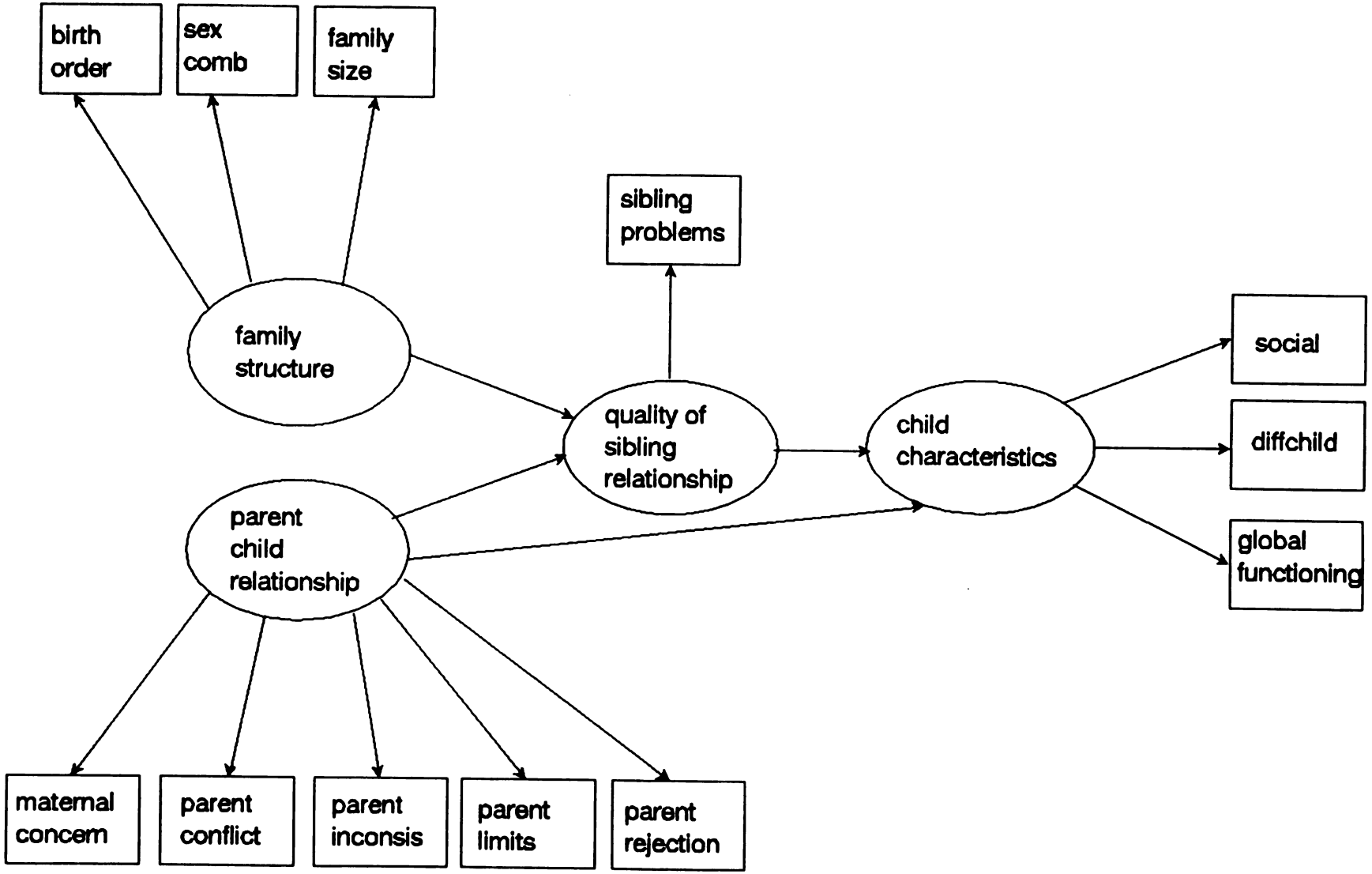

Figure 3. Final LISREL model of sibling relationships at age 3

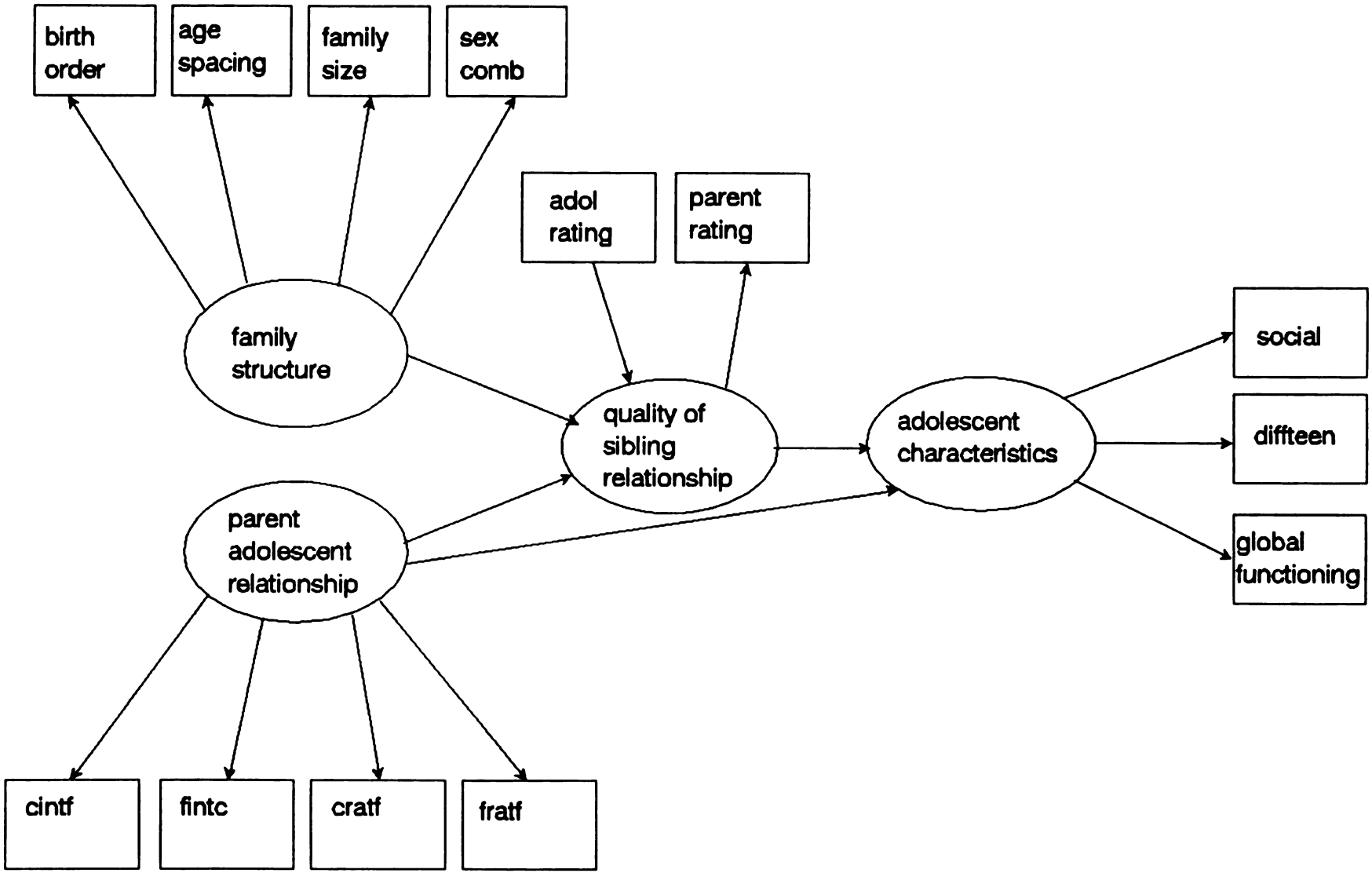

Figure 4. Final LISREL model of sibling relationships at adolescence

Table 8

Descriptive Statistics for Measures Used in the LISREL Model - Year 3

	M	SD
Family Structure Variables		
Birth order	2.02	.78
Sex combination	2.14	.82
Family size	2.54	.72
Quality of Parent-child Relationship		
Maternal concern	50.55	9.51
Parental conflict	51.51	10.17
Parental inconsistency	49.54	9.51
Parental limitations	50.33	10.03
Parental rejection	50.15	9.34
Quality of Sibling Relationship		
Sibling problems	1.27	.46
Child Characteristics		
Socio-cognitive skills	1.19	.26
Difficult temperament	1.76	.86
Child functioning	1.36	.20

Table 9

Descriptive Statistics for Measures Used in the LISREL Model - Adolescence

	M	SD
Family Structure Variables		
Birth order	2.02	.78
Sex combination	2.14	.82
Family size	2.98	.92
Age spacing	3.35	2.66
Quality of Parent-adolescent Relationship		
Adolescent rating interaction quantity with father	1.62	.45
Father rating interaction quantity with adolescent	1.80	.63
Adolescent rating emotional quality with father	2.05	.66
Father rating emotional quality with adolescent	2.05	.61
Quality of Sibling Relationship		
Relationship rated by adolescent	3.56	.95
Relationship rated by parent	3.62	.98
Adolescent Characteristics		
Socio-cognitive skills	4.38	1.73
Difficult temperament	-14.43	4.14
Child functioning	5.49	1.59

Table 10

Covariance Matrix in LISREL Analyses for Year 3

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Sibling Problems	.21											
2. Difficult temperament	.04	.72										
3. Psych. Well-being	.03	.05	.04									
4. Socio-cognitive Skills	.01	.05	.02	.06								
5. Family Size	.00	-.03	-.01	-.01	.08							
6. Sex Combination	-.03	-.06	-.02	-.03	-.01	.23						
7. Parental Conflict	-.08	.63	.49	-.28	1.00	-.01	96.15					
8. Maternal Concern	1.10	1.33	.09	-.07	-.23	-1.35	-7.12	88.43				
9. Parental Inconsistency	.66	1.70	.57	.38	-.44	-1.38	12.56	5.86	83.83			
10. Parental Strictness	.68	.86	.09	-.03	.71	-.08	-2.29	-7.27	-9.50	93.62		
11. Birth Order	-.06	-.03	-.02	.02	.01	.03	-.07	-.97	-.14	-.28	.19	
12. Parental Rejection	-.05	1.81	.20	.24	.21	-.17	11.13	9.73	24.17	-10.60	.56	81.22

Table 11

Covariance Matrix in LISREL Analyses for Adolescent Data

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	
1. Sib Rel (Adol. rating)	.85												
2. Sib Rel (Parent rating)	.48	.82											
3. Social skills	.35	.39	2.90										
4. Difficult temp	-.38	-.18	-2.57	14.20									
5. Psych. Well-being	.20	.20	1.69	-3.68	2.56								
6. Age Spacing	-.01	.06	.02	.15	-.01	.36							
7. Family Size	.02	-.02	-.01	-.30	.01	.09	.29						
8. Sex combination	-.08	-.18	.02	-.13	.10	-.46	-.45	2.43					
9. Child Interaction Rating for Father	-.02	-.04	.08	-.37	.24	.00	.01	.04	.18				
10. Father Interaction Rating for Child	-.07	-.11	.18	-.40	.28	-.01	.05	-.03	.07	.34			
11. Child Emotional Rating for Father	.01	-.06	.41	-.82	.56	-.03	.05	-.07	.19	.13	.40		
12. Father Emotional Rating for Child	.03	-.02	.25	-.71	.39	-.01	.04	-.07	.09	.19	.17	.31	
13. Birth order	.12	.12	.01	-.07	-.00	.09	.00	-.02	-.01	-.05	-.04	-.03	.18

parsimony ratio = .08. An investigation of the modification indices indicated that the model could be improved if the errors between several observed variables, parental conflict and child functioning, parental conflict and family size, and birth order and socio-cognitive skills, were allowed to correlate.

The modified model demonstrated good fit with the data. The chi-square with 46 degrees of freedom = 56.63 (p=.14). Other goodness of fit measures also indicated a good fit. The GFI = .90, the RMSR = .06, CFI =.90, and the parsimony ratio = .06.

Measurement model

Looking at the t-values[5] (Figure 5) one can see that the measurement model was weak. None of the observed variables loaded significantly on the latent variable of family structure, and only one of the parent-child relationship measures loaded significantly on the latent variable of quality of parent-child relationship. Only the latent variable of child characteristics seemed to be adequately measured. The observed variables for this latent structure did load significantly.

Structural model

The t-values show that the hypothesized relationship between family structure variables and the sibling relationship was not supported. This is not too surprising since there is literature that gives evidence both for and against the effects of family structure variables. The parent-child relationship was thought to influence the quality of sibling relationships. However, the data from this study did not support this

[5]The paths that do not have a t-value associated with them are the ones that were fixed to 1.00.

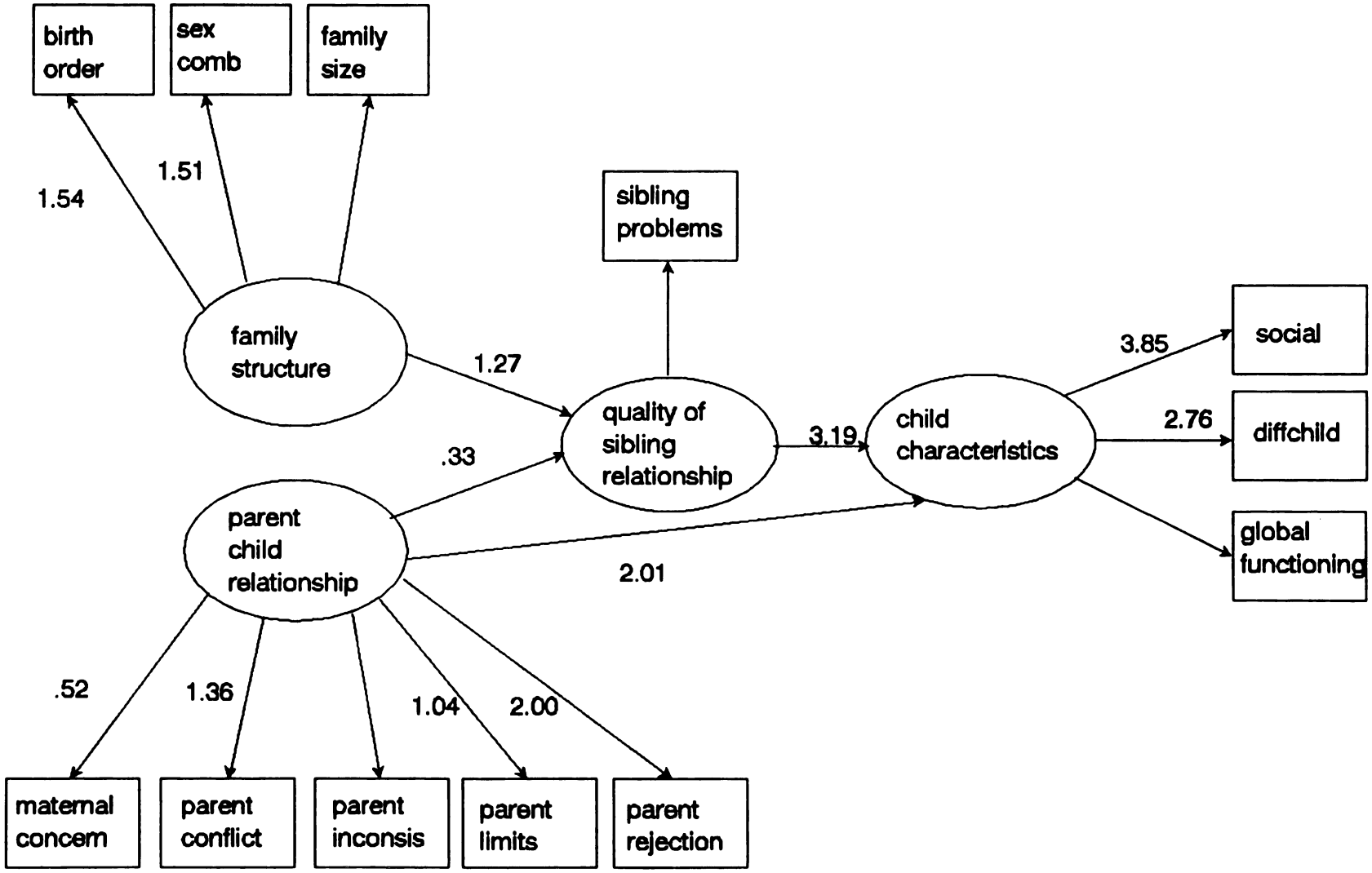

Figure 5. T-values for model of sibling relationships at age 3*

*Completely standardized solution in Appendix A

relationship either. The R square for the quality of sibling relationship predicted by family structure variables and the parent-child relationship was very small (.02).

Some hypothesized relationships were confirmed. The hypothesis that the parent-child relationship had an effect on child characteristics was supported. However, the estimate for this parameter was very small (.01). There was also evidence that child characteristics such as child functioning, difficult temperament, and socio-cognitive skills, are affected by the relationship he or she has with his or her brother or sister. The estimate for this parameter was .16. The R square for child characteristics predicted by the quality of sibling relationships and the parent-child relationship was .34. When the arrow between the quality of sibling relationships and child characteristics was reversed (to examine if child characteristics affected the sibling relationship) the path was significant ($t = 2.82$), and the model fit well, but the measurement model was weaker. Thus, the model in which the quality of sibling relationships predicted child characteristics was chosen as the final model.

Model of Sibling Relationships During Adolescence

Each of the latent constructs were defined by setting one of the factor loadings to 1.00 (family size to Family Structure, father rating the quantity of interaction with his child for Quality of Parent-Child Relationship, adolescent rating of the sibling relationship for Quality of Sibling Relationship, and adolescent functioning for Adolescent Characteristics). Regarding the Quality of Parent-Child Relationship construct, only the four ratings involving fathers (e.g., fathers rating the adolescent or the adolescent rating the father) were used as indicators. The other ratings, those involving the mother and both parents, failed in the model testing.

Model fit

When the adolescent model was initially run, there was poor fit between the hypothesized model and the data. The chi-square with 60 degrees of freedom = 96.58 ($p=.00$), the GFI = .86, the RMSR = .08, CFI = .88, and the parsimony ratio = .07. An examination of the modification indices revealed that a better fit could be obtained if the errors between several observed variables, child rating of emotional quality of relationship with father and child rating of quantity of interaction with father, father rating of the emotional quality of relationship with the child and father rating of quantity of interaction with the child, and birth order and age spacing, were allowed to correlate. When the measurement error of these variables were allowed to correlate, there was a much better fit between the data and model. The following describes this final model in more detail.

There was good model fit with the data. The chi-square with 57 degrees of freedom = 57.79 ($p<.45$). Other goodness of fit measures also indicated a good fit. The GFI = .91, CFI = 1.00, RMSR = .09, and the parsimony ratio = .06.

Measurement model

The measurement model for the adolescent model of sibling relationship was better than the year three model. As can be seen in Figure 6, with one exception, all of the observed measurement variables loaded significantly onto their respective latent variables. Unfortunately, the measures for the quality of the sibling relationship did not significantly load onto the latent variable.

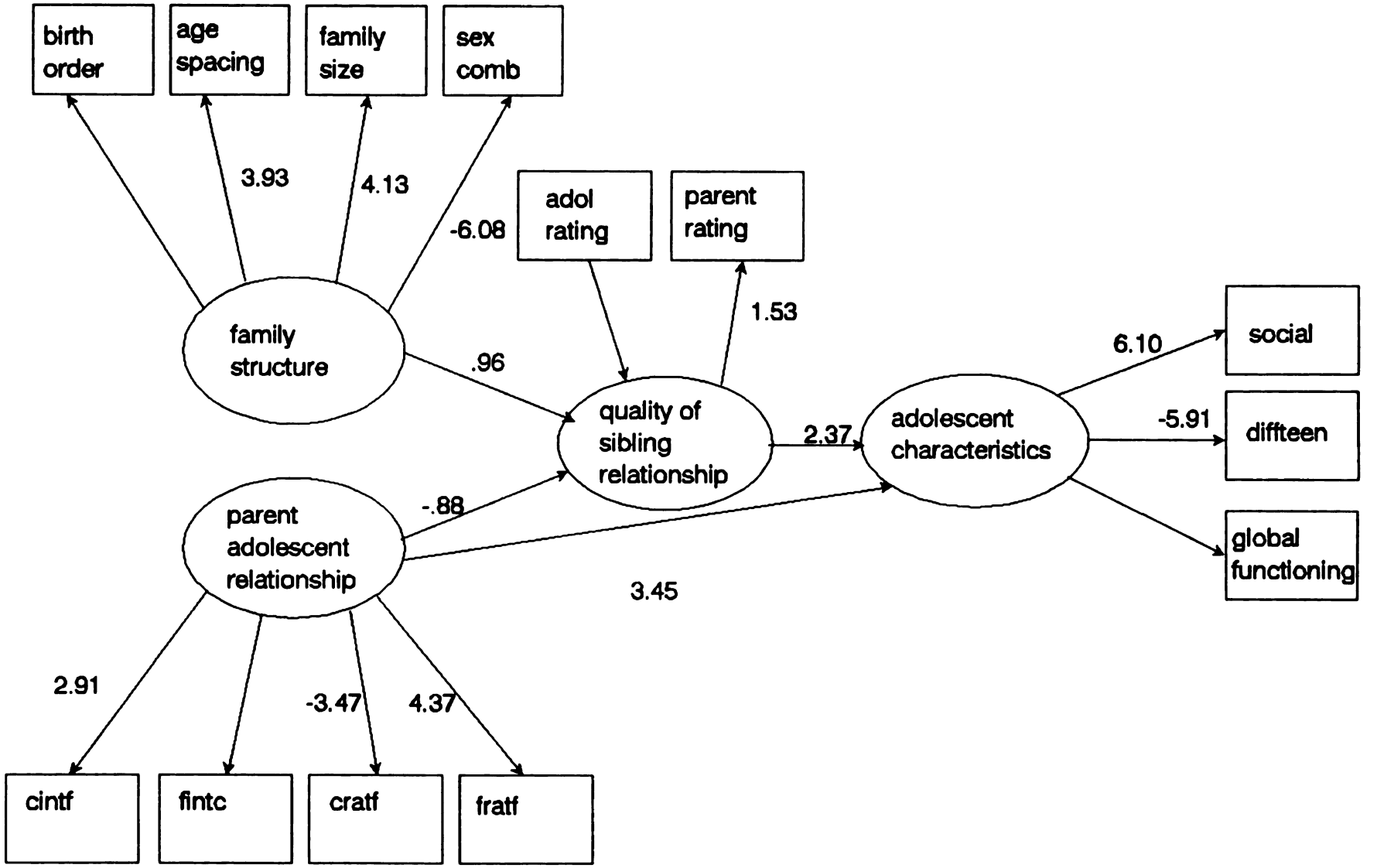

Figure 6.T-values for model of sibling relationships at adolescence* *Completely standardized solution in Appendix B

Structural model

Regarding the structural model, it looked similar to the model at age 3. Family structure and the parent-adolescent relationship did not seem to predict the quality of relationship the adolescent had with their sibling. The R square for these relationships was very small (.03). Again, as hypothesized at year three, the quality of parent-adolescent relationship was significantly related to adolescent characteristics. The estimate for this parameter was 4.31. The hypothesis that the quality of sibling relationship would significantly relate to adolescent characteristics was also confirmed. The estimate for this parameter was .73. The R square for adolescent characteristics predicted by the relationship the adolescent had with their sibling and the parent-adolescent relationship was .59. When the arrow was reversed between sibling relationships and adolescent characteristics (to see if adolescent characteristics would effect the quality of sibling relationships), the path was not significant (t = 1.33). Thus, the model where the path led from sibling relationships to adolescent characteristics was chosen as the final model.

The models seem to adequately fit the data, which does not necessarily mean that the model is correct, but that it is not incorrect (Cliff, 1983). All we can conclude is that the models shown here are possible representations of what is happening in a population given this particular data set (Raykov, Tomer & Nesselroade, 1991).

CHAPTER V

DISCUSSION

Limitations of the Study

The analyses revealed that some hypotheses were confirmed while others were not. The unexpected results could be due to several factors - perhaps there were problems in the theoretical reasoning and hypotheses building, perhaps the reasoning was correct but not for this sample, or perhaps there were methodological problems. For instance, regarding the latter, in year three, the quality of the sibling relationship was given an *overall* rating for the child and all his or her siblings. In other words, if a child had two or more siblings, one rating would be given by the parent on how problematic the child's relationship was with his or her brothers and/or sisters. However, this study required that only one sibling be chosen for analyses. Thus, the measure of quality of the sibling pair relationship did not necessarily capture the quality of relationship the child experienced with the sibling that was chosen.

Another drawback was that there was a focus only on the negative aspects of the sibling relationship - only sibling *problems* were assessed at age 3. Furthermore, there was not much variation in these ratings - a majority of parents (60%) rated sibling problems as insignificant. For the ratings of sibling relationships during adolescence, interviews were given one numeric rating. Some of the interviewees gave very detailed descriptions of the sibling relationship. Others did not have much to say - perhaps a sentence or two. It was difficult to assign ratings based on only a few words that did not draw a very complete picture of the relationship. Obtaining a consistent set of information on several aspects of the relationship would have given a

stronger, more accurate evaluation of the relationship. In sum, a better measure of the central focus of this study - sibling relationships - would have been valuable.

Another methodological weakness was that bidirectional influences between variables could not be assessed. This was unfortunate since much of the research on sibling relationships conducted thus far has been correlational in nature. Directions of influence have been hypothesized but have not been confirmed empirically. In this study the sample size was not sufficient to adequately estimate the numerous parameters, and the measurement model was somewhat weak. Unfortunately, the weak area involved the main variable of the study, and only a much simpler unidirectional model was assessed. Despite the numerous limitations to this study, there is an important advantage in using archival data. The ability to examine sibling relationships longitudinally for more than a decade is very rare in psychological research.

Findings

The only family structure variable that seemed to affect how siblings relate to one another was birth order. The findings support the hypothesis that later borns seem to experience more positive relationships with their siblings than first borns. Some researchers have speculated that earlier born siblings may be striving for more independence (Buhrmester & Furman, 1990), or perhaps resentful of losing their special status as the only child warranting attention, as hypothesized by other researchers (Dunn & Kendrick, 1982; Volling & Belsky, 1992). In contrast, later born siblings may want to be "more grown up" and do this by imitating and perhaps admiring their older sibling (Buhrmester & Furman, 1990). An unexpected finding

was that this was true only for boys at age three, but then during adolescence it was true only for girls.

Sutton-Smith and Rosenberg (1970) suggest that sex and birth order need to be examined simultaneously to have a more complete understanding of what it means to be a brother or sister. For example, being a third born male with two older brothers and one younger brother, would be different than being a male with two older sisters and one younger brother. For the latter boy, he may be treated more like a first born rather than a third born child because of his position in relation to the sex of his sibling. Unfortunately, this sex by birth order combination could not be examined in such detail in this study.

Other family structure variables, such as age spacing and family size, were not influential to the sibling relationship. One reason could be because there was such limited variance for these variables. For example, almost 40% of the participants were spaced 2-3 years apart from their sibling, and 92% came from a family size of either 2 or 3. Another family structure variable of interest, the sex composition of the sibling dyads, also did not seem to affect the relationship between siblings. For year three, this could be because the ratings for the sibling relationship was an *overall* rating. As stated previously, if a child had more than one sibling, there was no way to determine the quality of relationship the child had with each sibling pair. Thus, the sibling that was chosen for the sibling pair was not necessarily the one rated specifically. For the adolescent time period, it is very probable that at this age there are other influences on the sibling relationship that may outweigh the influence of structural variables.

As reviewed in the literature, there are studies that report little or no effect of family structure variables on the sibling relationship (Dunn, 1987; Dunn & Munn, 1986; Stocker, Dunn & Plomin, 1989). Instead, other variables such as the parent-child relationship may be a more powerful contributor in determining the quality of relationships between siblings. Using LISREL analyses, this study did not support this hypothesis at either year three or during adolescence. Earlier studies that have analyzed, in detail, how a mother behaves towards her children, have found maternal behavior to have an effect on the quality of relationship between the siblings (Dunn & Kendrick, 1982; Stewart et al., 1987). Perhaps if this study had included a more detailed measure of how the parents actually interacted with the child and his or her sibling in this study, a connection between parenting and the sibling relationship would have been supported.

However, using regression with certain aspects of the parent-child relationship, did reveal some significant linkages to the sibling relationship. For example, it was hypothesized that more maternal concern at age three would predict a more positive sibling relationship, but the opposite was found. More sibling problems were associated with more maternal concern. Perhaps those children with mothers who were more involved with them did not want their sibling to receive any of the attention they enjoyed, thus causing more conflict between siblings. These findings would lend support to Dunn and Kendrick's (1982) study that found that first born daughters who experienced an intense, close relationship with their mother experienced more negative relationships with their siblings. The researchers suggested that possibly these first borns felt jealous toward their siblings and were

angry at the loss of attention. However, it is also possible that those siblings who interacted more negatively with one another prompted the mother to show more concern and spend more time and energy with her children. Regression analyses do not provide sufficient information to show the direction of effects.

It was hypothesized that an adolescent who experienced more positive interaction with his or her parents would have a more positive sibling relationship, but the opposite was found for females. For females, more interaction with their father (but not their mother) meant more sibling conflict. Again, similar to what was found in year three, perhaps those female adolescents who enjoyed a close relationship with their father did not need a close relationship with their sibling, or were protective of the relationship they had with their father, resulting in more problems with their sibling. Perhaps these female teenagers already had conflictual relationships with their siblings, encouraging the father to spend more positive time with them. Crouter and Crowley (1990) propose that fathers' interaction may have a greater affect on their daughters than sons because it is expected that fathers interact with sons, but less so for daughters. Thus, higher levels of father-daughter involvement may be seen as something more "special," and thus may influence the girls' well-being more so than boys. Interestingly, for males, it was mothers that seemed to affect the relationship they had with their sibling. Male adolescents who rated the emotional quality of their relationship with their mother as being more positive also had a more positive relationship with their brother or sister.

In other findings, sibling relationships did seem to affect child and adolescent characteristics. We can make a causal statement such as this since structural equation

modeling was used to analyze these relationships. Regression analyses revealed that sibling relationships predicted child characteristics for girls, but not for boys. At year three, girls with more positive sibling relationships were better adjusted than those with less positive sibling relationships. During adolescence, females experiencing better relationships with their brother or sister scored higher on ratings of social functioning. This supports prior research that finds an inverse relationship between positive sibling relationships and behavior problems (Daniels et al., 1985; Richman, Stevenson & Graham, 1982) and a direct relationship between positive sibling relationships and social sensitivity (Light, 1979; Stewart & Marvin, 1984).

It is puzzling that these connections were true for girls but not for boys. Earlier studies report that girls seemed to experience more intense and closer relationships with their sisters than did boys with their brothers in preschool children (Minnett et al., 1983), school-age children (Buhrmester & Furman, 1990; Stoneman & Brody, 1993), adolescents (Buhrmester & Furman, 1985b), early adulthood (Cicirelli, 1992), and old age (Gold, 1989). Perhaps sibling relationships contribute more to girls' development than to boys'. This would support Larson and Asmussen's (1991) findings that girls seem to have a greater sensitivity to the family environment than boys.

Having a difficult temperament did not seem to relate to the relationship the child had with his or her siblings. Perhaps, in this sample, examining only one child's temperament was not sufficient. Instead, examining the combination of both the child's and sibling's temperament, as several researchers suggest (Munn & Dunn, 1989; Stoneman & Brody, 1993) may have revealed more.

In this study, child characteristics at age three did not predict the quality of sibling relationships during adolescence. Along the same lines sibling problems at age three did not significantly correlate with or predict the adolescent sibling relationship. Given these findings, it would seem that at age three, it is not feasible to make a definitive statement on how the child will interact with his or her brother or sister as a teenager. Furthermore, for this sample, the quality of the relationship a child has with his or her sibling does not appear to be continuous in the time period examined, but rather has potential to change. Investigating the factors and processes that relate to this change would shed more light on the complex nature of sibling relationships.

Future Research

The sample for this study was a very select sample of white, upper-middle class children and their families. Research on sibling relationships in other demographically diverse groups is needed. There is evidence that in other ethnic groups, or other cultures, siblings play a major role in a child's development. In some cultures, siblings replace the parent as the primary caretaker. In these contexts, the relationship between brothers and sisters may be much more salient to a child's development.

As in this study and all other studies on siblings, only sibling pairs have been studied. No studies exist that have examined interactions between three or more siblings. Investigating these types of interactions would be increasingly complex. However, knowing that a child exists in a network of relationships should prompt researchers to attempt to understand the quality of relationship a child has with *all* of

his or her brothers and sisters. If a child has two or more siblings, it is of course possible that he or she may have a very supportive relationship with one and be antagonistic to the other. No research has been conducted to find out how these differing relationships together affect the child.

In this study it was found that the quality of sibling relationships was not continuous from the third year of life to adolescence. It would be interesting to look at the sibling relationship in adulthood, and examine whether sibling relationships tend to stabilize as individuals move past adolescence and into adulthood, and old age.

This study provides some evidence that birth order and several aspects of the parent-child relationship are related to how well a child relates to his or her brother or sister. It has also shown that the sibling relationship can be related to a child's life such as child functioning and social interactions. Further investigations in this area can be an avenue for understanding more fully the impact of the family and family relationships on child development.

Appendix A

Completely Standardized Solution for LISREL Analyses at Age 3

LAMBDA-Y

	qualsib	chchar
SIBPROB	.92	
0DIFFCH		.36
GLOBAL		.86
NONFAM		.57

LAMBDA-X

	famstruc	parchild
FSIZE	3.57	
SEXCOMB	5.44	
BIRTHOR	-3.09	
PARCONF		.18
PARCONC		.07
PARINC		.87
PARLIM		-.14
PARREJ		.33

BETA

	qualsib	chchar
qualsib		
chchar	.39	

GAMMA

	famstruc	parchild
qualsib	-2.59	.06
chchar		.37

CORRELATION MATRIX OF ETA AND KSI

	qualsib	chchar	famstruc	parchild
qualsib	1.00			
chchar	.46	1.00		
famstruc	.01	-.01	1.00	
parchild	.18	.44	-.05	1.00

PSI

qualsib	chchar
1.03	.66

THETA-EPS

SIBPROB	DIFFCH	GLOBAL	NONFAM
.15	.87	.26	.67

THETA-DELTA-EPS

	SIBPROB	DIFFCH	GLOBAL	NONFAM
FSIZE				
SEXCOM				
PARCONF		.24		
PARCONC				
PARINC				
PARLIM				
BIRTHOR			.33	
PARREJ				

THETA-DELTA

	FSIZE	SEXCOM	PARCONF	PARCONC	PARINC	PARLIM
FSIZE	1.08					
SEXCOM		1.19				
PARCONF	.39		.97			
PARCONC		-.27		1.00		
PARINC				.24		
PARLIM					.98	

	BIRTHOR	PARREJ
BIRTHOR	1.06	
PARREJ		.89

REGRESSION MATRIX ETA ON KSI (STANDARDIZED)

	famstruc	parchild
qualsib	-2.59	.06
chchar	-1.01	.39

Appendix B

Completely Standardized Solution for LISREL Analyses at Adolescence

LAMBDA - Y

	sibrel	adchar
SIBRELA	.50	
SIBRELB	1.13	
SOCIAL		.65
DIFFTEEN		-.64
GLOBAL		.95

LAMBDA - X

	famstruc	paradol
SPACE	.49	
FSIZE	.53	
SEXCOM	-1.01	
BIRTHOR	.02	
CINTF		.54
CINTC		.46
CRATF		.79
FRATC		.62

BETA

	sibrel	adchar
sibrel		
adchar	.22	

GAMMA

	famstruc	paradol
sibrel	.13	-.13
adchar		.76

CORRELATION MATRIX OF ETA AND KSI

	sibrel	adchar	famstruc	paradol
sibrel	1.00			
adchar	.13	1.00		
famstruc	.12	.08	1.00	
paradol	-.12	.73	.07	1.00

PSI

sibrel	adchar
.97	.41

THETA-EPS

SIBRELA	SIBRELP	SOCIAL	DIFFTEEN	GLOBAL
.75	-.28	.57	.59	.09

THETA-DELTA

	SPACE	FSIZE	SEXCOM	CINTF	FINTC	CRATF	FRATC	BIRTHOR
SPACE	.76							
FSIZE		.72						
SEXCOM			-.02					
CINTF				.71				
FINTC				.79				
CRATF				.27	.37			
FRATC				.31	.62			
BIRTHOR	.33					1.00		

REGRESSION MATRIX ETA ON KSI (STANDARDIZED)

	famstruc	paradol
sibrel	.13	-.13
adchar	.03	.73

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