Spring 2015

The Effects of Familial Relationships and Sibling Sex Composition on Behavioral Adjustment in Middle Childhood

Elyse I. Pierce
Hamline University

The Effects of Familial Relationships and Sibling Sex Composition on Behavioral Adjustment in Middle Childhood

Elyse I. Pierce

Hamline University

Abstract

Differences in familial relationship qualities have been linked to children's adjustment during middle childhood (Bank, Burraston, & Snyder, 2004). Children with familial relationships characterized by positivity typically have fewer behavior problems than children with more negative familial relationships. However, less is known about how the parent-child and sibling relationships influence children's adjustment concurrently. In the present study, parent-child and sibling interactions were rated on positivity and negativity. Parental ratings of children's adjustment and relationship qualities were also examined. The presence of negativity in the parent-child and sibling relationships predicted poorer adjustment. Sibling negativity predicted additional variance above and beyond parental negativity alone. This highlights the importance of considering how parent-child and sibling relationship qualities together influence children’s overall adjustment.

Keywords: middle childhood, internalizing, externalizing, behavioral adjustment, family relationships

The Effects of Familial Relationships and Sibling Sex Composition on Behavioral Adjustment in Middle Childhood

One of the factors that influence individual variation in social, emotional, and cognitive outcomes is a person's relationship with her or his parents, siblings, and other family members growing up (Bank, Burraston, & Snyder, 2004). The family environment provides our first context for socialization, learning, and the development of social-emotional bonds with others. Behavioral tendencies formed in the family environment often serve as a template with which later relationships in life are formed. For example, the success of adolescent and adult peer and romantic relationships are related to the familial relationship style and quality experienced during childhood (Gaines et al., 1999). Because they are a crucial starting point for the development of social interaction, emotional experience, and cognitive competency, it is important for researchers to better understand the family-wide study of relationships.

Family Systems Theory

When considering the influence of multiple familial relationships on a child's development, a Family System Theory paradigm proves to be particularly useful. This theory is based on the idea that families are composed of dynamic, interactive subsystems that co-exist and influence one another (Brody, 1998). There are three distinctive characteristics of Family Systems Theory, namely emphasis on the family as a whole unit, its hierarchical structure, and its adaptive self-organization (Cox & Paley, 2003). There are likewise three primary subsystems, which are identified as the marital/couple subsystem, the parental subsystem, and the sibling subsystem (Cox & Paley, 2003; Fleming, 2003). Note how a single person may be a member of multiple subsystems; what is different between subsystems is the *combination* of individuals. This theory stresses that no one relationship between two family members should be examined in isolation, but in the context of a web of interconnected

networks. Examination of these systems in combination is important, yet it has not been given sufficient attention in the field. Past studies have primarily focused on one system and only more recently have begun to integrate more than one. This study will pay particular attention to the parental and sibling subsystems and how they interact. This broad, holistic view of development allows a more inclusive grounding framework for the study of family-wide relationships.

The Parent-Child Relationship

While it is important to be cognizant of the interactions between relationships, it is also beneficial to examine each type of relationship in a child's family life one at a time before combining their effects. Therefore, the first aspect of a child's familial environment, one that has been well studied and has yielded consistent and robust findings, is the effect of the parent-child relationship on the child's later development. Parents serve as one of the first social, emotional, and intellectual models children typically have and often represent one of the closest relationships an individual will form during their childhood. Therefore, to better understand exactly what type of influence a parent's child-rearing style has on their children's development and through what mechanisms these effects come about, several studies have analyzed the parent-child relationship.

The first broad conclusion found in the research is that parents have a strong influence on their children's developmental outcomes, and that a positive parent-child relationship is associated with healthier developmental outcomes for the child (National Institute of Child Health and Human Development Early Child Care Research Network, 2004; Williams, L.R. et al., 2009). The research indicates a variety of behaviors and characteristics that are associated with the broad term of "positive parent-child relationship." Some of these include support for autonomy (NICHHDECCRN, 2004), democratic participation, and warmth/positive affect (Williams, L.R. et al., 2009). Several areas of development are affected, including social (Bank et al., 2004; NICHHDECCRN, 2004; Williams,

Conger, & Blozis, 2007), emotional (Bank et al., 2004; Renk, Roddenberry, Oliveros, & Sieger, 2007; Williams, L.R. et al., 2009), and cognitive (Bank et al., 2004). This effect has been found for both fathers (Kaczynski, Lindahl, Malik, & Laurenceau, 2006; NICHHDECCRN, 2004; Williams, S.T. et al., 2007) and mothers (Gass, Jenkins, & Dunn, 2006; Williams, S.T. et al., 2007).

The inverse of this has been validated through research as well. Negative parenting behaviors, such as lack of supervision, conflictual communication, ineffective problem-solving strategies (Bank et al., 2004), disapproval, unavailability (Stocker, 1993), restrictiveness (Williams, L.R. et al., 2009), harsh discipline, and negative affect (Deater-Deckard, 2000) have been associated with less optimal developmental outcomes. In addition, when a conflictual marriage causes parents to exhibit more negative parenting behaviors, such as hostility and rejection, children's associated adjustment outcomes worsen in what is called the “spillover effect” (Kaczynski et al., 2006; Pike, Coldwell, & Dunn, 2005). Finally, parental negativity has more of a deleterious effect on children's development than a lack of positivity and warmth (Gass et al., 2006).

Two commonly studied aspects of children's adjustment are internalizing behavior and externalizing behavior. Internalizing behavior is defined as problematic emotional disregulation (anxiety or depression), somatic issues, and withdrawal (Achenbach, 1991; Levesque, 2014). Externalizing behavior is defined as outward aggressive and antisocial behavior (Achenbach, 1991; Levesque, 2014). Research has shown that is important to distinguish between internalizing and externalizing behavioral outcomes (Williams, L.R. et al., 2009).

Among those who have found associations between aspects of the parent-child relationship and internalizing behaviors, Stocker, Burwell, and Briggs (2002) examined psychological adjustment in three areas (two internalizing and one externalizing): anxiety, depressed mood, and delinquent behavior. Associations were found between maternal hostility and internalizing behavior only. Studies

that have found parent-child effects in areas the externalizing dimension include that of Williams, S.T. et al. (2007). They found that if parents displayed hostility toward their children, those children would have higher levels of interpersonal aggression. This demonstrates how parental hostility influences externalizing problem behavior only. The reason for these differing findings is unclear.

The majority of research on the parent-child relationship finds evidence for parental influence on both internalizing and externalizing behavior. Dunn, Slomkowski, Beardsall, and Rende's (1994) study indicated that parents affect both internalizing and externalizing behaviors of their children longitudinally. Here, maternal mood was negatively correlated with internalizing behavior scores regardless of child, while externalizing behavior scores were negatively correlated only for older children. Another study investigated the social development of young children as they transitioned from preschool/daycare age to attending elementary school. Children whose fathers were supportive and sensitive to their development had lower internalizing and externalizing scores and higher social skills levels (NICHHDECCRN, 2004). Finally, Kaczynski et al. (2006) found evidence of both oppositional behavior and aggression (externalizing behavior) and feelings of insecurity (internalizing behavior) among children experiencing negative parenting.

Groups of parenting behaviors are sometimes classified into parenting styles, which have been shown to affect developmental outcomes. Permissive parenting is associated with greater internalizing behavior among children, while Authoritarian parenting is associated with greater externalizing behavior, and Authoritative parenting is associated with lower levels of both (Williams, L.R. et al., 2009). These correlations were especially true for children with difficult temperaments. The question of internalizing versus externalizing is complicated by sex as well. The different combinations of parent sex and child sibling sex constellation have been demonstrated to follow distinct interaction patterns (Tucker & Updegraff, 2009). A 2004 study by the National Institute of Child Health and Human

Development Early Child Care Research Network found that in cases of unsupportive parent-child relationships, sons tended to develop more externalizing behavior problems while daughters tended to develop more internalizing behavior problems. This was especially true of the relationship between fathers and daughters, and especially when the parental marital relationship was also conflictual. These studies demonstrate that the nuances of domain effect still need to be clarified within the field.

To uncover not only the effects, but also the mechanisms of parental influence, Renk et al. (2007) looked at maternal perceptions and development. They found that when mothers rated their own depressed moods, their parenting stress, their feeling toward their children, and their child's behavior problems (both internalizing and externalizing), negative maternal perceptions mediated the relationship between depressive symptoms, parenting stress, and children's internalizing and externalizing behavior. This shows that negative aspects of the parent-child relationship lead to damaging outcomes through the mechanism of negative perceptions. This is just one of many mechanisms that are likely to be having an effect.

In line with the Family Systems Theory, investigations have found that children as well as parents can affect the parent-child relationship. One way this occurs is through child characteristics, such as temperament. While temperament has been shown to have an evocative effect on parental treatment (Deater-Deckard, 2000; Hines, Kantor, & Holt, 2006), challenging temperaments do not always equal challenged parent-child relationships. Certain aspects of the parent-child relationship that can be protective factors in that regard. Whereas the type of disciplinary strategy used by mothers did not predict later internalization and externalization among children with emotionally intense and/or highly active temperaments, maternal affection and warmth could (Brody, 1998). Similarly, in examining the temperamental components of behavioral inhibition in relation to parenting styles, it was found that Authoritative parents could reduce the behavior problems associated with their child's

temperamental trait through their interaction style (Williams, L.R. et al., 2009). Therefore, even the effects of child-specific characteristics may be countered with positive parenting practices.

In summary, more positive parent-child relationships are associated with more optimal social, emotional, and cognitive development in children (Bank et al., 2004; Tucker and Updegraff, 2009). This has been established across such dimension as warmth, responsiveness, and involvement, and has been investigated in light of co-factors such as parent and child sex and child temperament. While there is still some debate about some specifics, such as which dimensions of behavioral outcomes are affected and why, the general conclusion of the literature is that a child's relationship with his or her parent(s) affects their development in a significant way.

The Sibling-Child Relationship

Another important familial relationship that can be highly influential on children's lives is their relationship with their siblings. It has been calculated that by middle childhood, siblings spend more time with each other than with parents, teachers, friends, alone, etc. (McHale & Crouter, 1996). Further, because family members such as parents and children are separated by generations and because most people do not meet their partners until adolescence or adulthood, it is likely that one will know their sibling longer than they will know any other person in their lifetime. Therefore, the study of the quality of sibling relationships and the effect it has on adjustment outcomes is a quite worthwhile endeavor.

The majority of child development studies have focused on the parent-child relationship and ignored siblings as an influencing factor. Yet as the influence of the sibling relationship began to be more frequently examined, it was found that siblings can in fact have a large, independent impact on their brothers' and sisters' adjustment outcomes (Gass et al., 2007; Tucker & Updegraff, 2009). Much like the parent-child relationship, the sibling-child relationship has been shown to affect social (Dunn, 1992; Bank et al., 2004; Pike et al., 2005), emotional (Dunn et al., 1994; Tucker & Updegraff, 2009),

and cognitive (Brody, 1998; Klein, Feldman, & Zarur, 2002) development.

The general trend across studies examining the sibling relationship is that the better the relationship quality between siblings, the better the social-emotional development of both children (Brody, 1998; Brody, 2004; Richmond, Stocker, & Rienks, 2005). This has been established by studying the traits of positive sibling-child relationships, such as nurturance (Brody, 2004), collaboration in play (Dunn et al., 1994), affection (Gass et al., 2007), and sharing (Pike et al., 2005) and their associated positive developmental outcomes. Much like the results of examining the parent-child relationship, this has also been established by studying aspects of what constitutes a negative sibling-child relationship, such as conflict (Bank et al., 2004), rivalry (Gass et al., 2007), and hostility (Dunn et al., 1994), and the associated poor adjustment. Much like in the parent-child relationship, there are several other specific relationship quality influencing factors that have found empirical support.

Sibling Relationship Quality and Problem Behaviors

Although numerous studies have indicated the importance of the sibling relationship in relation to children's development, the precise mechanisms by which the sibling relationship has its influence on later development is still being elucidated. Several studies have gathered data attesting to siblings' effect on internalizing behavior. Positive, warm sibling relationships are correlated with fewer internalizing problems (Gass et al., 2007) for both children in a sibling pair (Richmond et al. 2005). Others demonstrate that while children can in fact have an impact on the internalizing behavior of their siblings, they can also impact externalizing behavior as well. Adolescent's scores on internalizing and externalizing measures are best predicted by the quality of the sibling relationship two years earlier (Stocker et al., 2002) and the externalization behavior of both younger and older siblings and the internalizing behavior of only younger siblings are negatively correlated to the quality of the sibling

relationship over time (Dunn et al., 1994). So while the specifics are not yet satisfactorily settled, these studies show that the sibling relationship does have a general effect on children's outcomes.

Independence of Positivity and Negativity in Sibling Relationships

The literature on sibling relationships suggests that the presence or absence of positive interaction aspects between siblings has far more predictive power than the presence or absence of negative interaction aspects. Dunn et al. (1994) found that in interviewing and observing siblings in their everyday environments over a span of many years, those who indicated less warm and friendly feelings for their siblings had more internalizing problems (for younger siblings) and more externalizing problems (for older siblings) two years later. However, instances of fighting between siblings in the observation or criticisms of the sibling in the interview did not correlate with increased longitudinal adjustment issues. Likewise, in a study that divided children into three groups based on their sibling relationship quality (high conflict/low warmth, high conflict/high warmth, low conflict/high warmth), those in the high conflict/high warmth group were rated highest in terms of social adjustment (Stormshak et al. 1996 as cited in Brody, 1998). Pike et al. (1995) also found that child adjustment outcomes were related to maternal ratings of positivity within the sibling-child relationship, but not to maternal ratings of negativity. These studies demonstrate not only the most ideal sibling relationship nature, but also attest to the independence of positivity and negativity in relationships.

Several researchers have proposed explanations for why this trend is so prevalent. Brody (1998) suggested that sibling conflict provides a safe environment in which to practice social problem-solving. Brody (2004) hypothesized similarly that conflict with one's sibling allows children to learn to detect others' feeling and viewpoints. Considering that brothers and sisters with high levels of both support and warmth had the highest relationship satisfaction compared to other combinations (Tucker &

Updegraff, 2009), perhaps the process of confronting and resolving conflicts has valuable social meaning to siblings.

These investigations into the basic workings of sibling relationships have established a firm base off of which more research can be built. Siblings have a definitive impact on each other during childhood. Overall positive relationships result in overall positive adjustment for the members of a sibling pair, and these adjustment outcomes span, to varying degrees, across the internalizing and externalizing dimensions of socio-emotional development. While generally negative sibling relationships are associated with less optimal outcomes, the presence of some negativity in a relationship is less detrimental than a lack of positivity.

Sibling Constellation

Sibling constellation is an important area of sibling relationship research. Siblings can be thought of not only in terms of the quality of their relationship with each other, as discussed above, but also in terms of their inherent, naturally occurring attributes and how they relate. The three factors examined in the literature are birth order, age spacing, and sex composition.

Birth order and age spacing. Siblings can theoretically be as far spaced out as their shared parents' reproductive lifespan, or as close as a few seconds in the case of multiple-birth siblings (monozygotic twins, dyzygotic twins, triplets, etc.). By exploring the sibling constellation subsets of birth order and age spacing, researchers have discovered many factors that influence the sibling-child relationship, two of which are sibling power imbalance and role asymmetries.

Several studies have shown that in terms of sibling pair relationship quality, the older sibling has more influence than the younger (Brody, Stoneman, & Gauger, 1996; Brody, 1998; Pike et al., 2005; Stoneman & Brody, 1993). One possible explanation for why older children have more influence on sibling relationship quality is that the older siblings are more dominant (Brody et al. 1996; Brody

1998; Stoneman & Brody, 1993). Other propose that it is due the effect of the older sibling's relationship with their mother in that whatever the quality of the older child-parent relationship is, because that relationship is more long-lived, that tone will carry over to the sibling-child relationship (Brody et al., 1996). Finally, it could be that if the older sibling has a more difficult temperament than the younger, their social experiences with others would be more negative and carry over to the sibling relationship via a disrupted relational orientation (Brody et al. 1996). In addition, in the context of a lack of parental intervention, the older sibling's dominance is further accentuated, supposedly because the parent is not there to equalize the interaction with their authority (Brody, 1998). Further investigations into this subject are sure to further clarify this phenomenon.

An area of investigation related to power balance is siblings' displays of role asymmetries when the children are not multiple-birth siblings. The findings have been quite robust that when siblings are of different ages, substantial age and birth order effects arise. These effects manifest as differing roles, which include teacher-student, mentor-mentee, helper-helpee, and tutor-tutee, among others. Role asymmetries are more pronounced the greater the age spacing between children in a family (Tucker & Updegraff, 2009). Stoneman, Brody, and MacKinnon (1986) investigated activity choices and role behaviors among siblings and found significant role asymmetries across a large variety of situations that covaried with child age and birth order. Older siblings were much more likely to act as teachers, helpers, and managers while younger siblings were much more likely to act as learners, helpees, and managees (Brody, Stoneman, MacKinnon, & MacKinnon, 1985). Older siblings also have been shown to initiate both more prosocial and more agonistic behavior, while younger siblings imitate their older brothers and sisters much more often than visa-versa (Abramovitch, Corter, & Pepler, 1980). In addition, research has indicated that these asymmetries may be beneficial for younger siblings. For example, Klein et al. (2002) found that when introduced to a novel game or toy, the younger siblings'

performance improved greatly when provided assistance by their older sibling. Role asymmetries may benefit older siblings as well. Brody (2004) found that older siblings that displayed high dominant role-taking behavior (teaching, caregiving, etc.) scored higher on reading comprehension, language achievement, and social-emotional understanding compared to children who had not taken on these roles before. Therefore, sibling role asymmetries seem to benefit older and younger siblings alike.

As the younger sibling in a pair grows chronologically older, sibling role asymmetries have been shown to decrease (Munn & Dunn, 1989; Pike et al., 2005; Stoneman & Brody, 1993). That is, a younger sibling may evoke large amounts of asymmetric role behavior within the sibling pair when they are toddlers, but as they age into middle childhood, these asymmetries tend to disappear. There is also a moderate relation between the older sibling's rating of the quality of their sibling relationship and role asymmetries. The more positive the sibling-child relationship, the less role asymmetry there was between the older and younger sibling and the less the older sibling had to manage and help their younger brother or sister (Stoneman & Brody, 1993). Perhaps these findings point to a larger trend in that the more egalitarian a sibling relationship is, or the more like a peer friendship, and the less hierarchical a sibling relationship is, or less like a parental proxy, the more positively siblings will rate their relationship with each other.

So while role asymmetries are shown to be beneficial to the development of each child in a sibling pair, the presence of high role-taking behavior also decreases positivity in the children's relationship with each other. It has been stated that when siblings take on complementary and reciprocal roles, it provides a unique relational category somewhere between that of the inequality of a parental relationship and the closeness and openness of a peer relationship (Tucker and Updegraff, 2009). These instances of role asymmetry influence the sibling relationship in and of themselves, but also beyond the contemporary time and context. These experiences in childhood seem to prepare

children for social challenges in the future.

Sex composition. A pertinent component of sibling constellation is sex composition. When taking into account the effects of sex composition on sibling relationships, there are at least two ways to conceptualize it. The first is to consider the effects of biological sex on each individual in the dyad separately. These sex influences would hold outside the context of a sibling relationship because they act on each child as an individual.

The data on individual sex effects are robust. It is well established that males are, on average, more aggressive than females (Brody et al. 1985; Segal, Connelly, & Topoloski, 1996; McCoy, Brody, & Stoneman, 2002; Williams, S.T. et al. 2007; Tucker & Updegraff 2009). Females are, in turn, more prosocial (Brody et al. 1985; Segal et al. 1996). Males typically have more difficult, active temperaments (McCoy et al. 2002; Stoneman & Brody 1993) and have been shown to experience significantly more parental emotional and cognitive neglect than females (Hines et al., 2006).

The second way to conceptualize sex effects is in terms of the sex composition of the dyad. These effects take into account not only the sex of each child and the associated traits, but also how same-sex and cross-sex pair status and the age order of the sex composition interact and influence outcomes. Many specific findings have been gathered around this idea. Some researchers have found that siblings who are similar in age and sex show higher levels of support toward one another (Dunn & Kendrick, 1981; Tucker & Updegraff, 2009). Along the same line in terms of sex matching, siblings of the same sex are more likely to have the same attachment style classification to their mother (van Ijzendoorn, Moran, Belsky, Pederson, Bakermans-Kranenburg, & Kneppers, 2000), and it has been found that same-sex siblings have more similar experiences of neglectful parenting behaviors than cross-sex siblings do (Hines et al., 2006).

Other studies have less to do with the similarities between same-sex siblings and more to do

with the specific effects of sex composition on sibling relationship quality. One such finding is that the condition of having a younger sister is associated with more depressed mood and anxiety in both older sisters and older brothers (Richmond et al. 2005; Stocker et al. 2002). Older sisters, however, were associated with more prosocial sibling interactions and more adaptability towards both younger brothers and younger sisters (Abramovitch et al. 1980; Stoneman & Brody 1993). Elder female children from dual-earner homes were responsible for sibling caregiving more than any other age or sex (McHale & Crouter, 1996). McHale and Crouter (1996) found that the sex composition of the sibling dyad was related to how much time a father will spend playing with his children. Older boy-younger girl dyads experience the highest average of minutes per week spent with their father, followed by girl-girl dyads, boy-boy dyads, and finally older girl-younger boy dyads.

Effects that depend on the sex of both siblings include conflict levels, amounts of mediation, affect, and negative feedback. Male-male dyads are observed as having the highest levels of conflict (Williams, S.T. et al. 2007; Stoneman & Brody 1993), but also play alone the most (Stoneman et al., 1986). In fact, the presence of any brothers in a dyad increases conflict relative to each male. Two brothers had the most conflict, one brother and one sister had moderate amounts, and two sisters had the least amount. Double male pairs also show the lowest levels of mediation, the most amplifying affect, and the most negative feedback (Klein et al. 2002). Female-female pairs, in contrast, are the least competitive (Stoneman et al., 1986). Finally, older brother-younger sister pairs have the most positive verbal interactions, while older sisters have more positive physical contact than older brothers in general (Stoneman et al., 1986). This cluster of findings show that any of the four combinations of sex and age in a sibling pair are associated with their own interaction and relationship patterns.

Risk and Protective Factors

A discussion that frequently emerges from within the sibling relationship literature is that of the

concept of siblings as risk or protective factors in development. Especially with the abundance of findings on the impact of the sibling relationship on individual children's adjustment discussed above, the possibility of there being additional risk and/or protective factors inherent to the condition of being a sibling is the next logical exploration.

Indeed, researchers who have undertaken such an inquiry have found evidence of both risk and protection. Particularly when the child's social environment has high levels of stress already, the presence of a positive sibling relationship can act as a buffer against maladjustment due to stress (Gass et al. 2007), parental marital conflict (Brody 1998; Brody 2004; Tucker & Updegraff 2009) or divorce (Brody, 1998), difficult temperament (Brody 1998; Brody et al. 1996; Stoneman & Brody 1993), and poor peer relationships (McCoy et al. 2002). Yet similar to the effects of sibling relationships in typical environments, in these situations older siblings serve as better protectors to younger siblings than younger siblings do to older (Brody, 1998).

The flip side of this is that certain confluences of characteristics also tend to result in siblings acting as risk factors. One of the most common ways this has been documented is siblings acting as "partners in crime." If an older sibling is involved in delinquent behaviors there is a much greater likelihood that the younger sibling will be drawn into delinquency as well. This is especially true when the older sibling is male (Williams, S.T. et al. 2007), when the older sibling has high levels of aggression (Brody 2004; Williams, S.T. et al. 2007; Tucker & Updegraff 2009), and when the siblings are of the same sex (Brody 2004; Williams, S.T. et al. 2007). Another study by Steelman, Powell, Werum, & Carter (2002) found that older brothers are also educational attainment risks to their younger siblings of both sexes. This collection of studies show that some aspects of the sibling condition, regardless of relationship quality, has very real consequences for each child involved.

These studies show that while there still exists considerable disagreement in the field over

several key components of the sibling relationship, it is nonetheless a pivotal force in the lives of children. The better the quality of the relationship between siblings, the better their social-emotional development will be (Brody, 1998; Brody, 2004; Richmond, Stocker, & Rienks, 2005). This has been established by examining aspects of the sibling relationship from risk and protective factors to sex composition, and highlights the role siblings play in each other's middle childhood development.

Interactions Between the Parent-Child Relationship and the Sibling-Child Relationship

The parent-child relationship and the sibling-child relationship likely add independent variation to children's developmental outcomes. Yet according to Family Systems Theory, parent-child and sibling-child relationships should not be studied solely in isolation, as they typically have been, but as interactive subsystems. This means that a child could affect the relationship between their sibling and their parent, or that a parent could influence the relationship between two of their children. Thus, the interactive effects of both relationship types will only be brought to light when examined together (Tucker & Updegraff, 2009). These two types of familial relationships now need to be examined in terms of their interaction with each other.

To that effect, studies that have examined parent-child and sibling-child relationships simultaneously have found that behavior problems occur more often in adolescents who have both rejecting parents and highly conflictual sibling relationships than in those who experience either factor in isolation (Bank et al., 2004; Tucker & Updegraff 2009). They “function synergistically to amplify risk to antisocial behavior” (Bank et al., 2004, p.117). These studies attest to the notion that both types of relationships work in conjunction with one another and can affect outcomes additively. In an even more detailed investigation, at least one study has found that the parent-child relationships between the father-older child, father-younger child, mother-older child, and mother-younger child all independently affect the sibling-child relationship (Brody et al. 1996). As any of the four parent-child

dyadic relationships improve, the sibling relationship would improve as well. This is a significant finding because it demonstrates Family Systems Theory in action. An event or relationship outside of one familial subsystem can wield influence on another subsystem.

Other studies have found that the effects of the quality of the sibling relationship have more predictive power than the effects of the parent-child relationship (Bank et al., 2004; Gass et al. 2007; Stocker et al. 2002). In some cases, these results were found within the context of environmental stress (Gass et al. 2007), others in arrest rates (Bank et al., 2004), and in yet others they came about through investigations of sex composition and parental marital conflict (Stocker et al. 2002). Regardless, the fact that siblings can affect one another's outcomes above and beyond a relationship as monumental during childhood as a parental one highlights the importance of considering all types of familial relationships equally, for the results may be surprising.

Further proof of the interconnectedness of parents, children, and siblings is the finding that children who not only experienced positive relationships with both their parents and their siblings themselves, but who also, as a third party, witnessed the positive interactions between their parents and siblings, had better later adjustment (Dunn, 1992). A mechanisms for this has been suggested in that children first learn constructive social skills through positive relationships with their parents, and then extend those relational tendencies to their siblings, thus the resulting relationship is positive in nature (Brody, 1998). Of course, this effect works for the other end of the spectrum as well, in that negative parent-child relationships can also contribute to negative sibling-child relationships.

In contrast to the positive association model, McHale and Crouter (1996) found that parental hostility is associated with more involved and supportive sibling relationships. This shows how once again siblings can act as protective resources to each other, and also how the two relationship subsystems spill over to affect one another, and not necessarily in the same direction. Similarly, Dunn

& Kendrick (1981) found that the more time a mother spends interacting positively with her second-born child, the less positive behavior the siblings directed toward each other. However, this study was conducted when second-born children were infants and toddlers, and therefore the pattern of interaction observed may have been confounded by feelings of jealousy on the part of the first-born children who until just a few months prior had been singletons, and now had to split their parents' attention with a sibling. Therefore it is unclear if this negative interaction has lasting influence or if it persists into later childhood and adolescence.

Another study that found yet another nuance to the connectedness between the family relationship systems concerned parental marital conflict. More conflict and less cohesiveness between parents were associated with a lower quality relationship between siblings (Brody, 1998; McHale & Crouter, 1996). Further, higher levels of parental depression and hostility resulted in higher conflict between siblings and less warmth (Brody, 1998). It is suggested that the associations between the dimensions are mediated by the parent-child relationship. That is, if a parental marital relationship is conflictual, the sibling relationship will become conflictual only if the marital hostility directly impacts the parent-child relationship. Once again, these studies have shown the total enmeshment of all kinds of various familial relationships that cannot be parsed apart.

In conclusion, having both a positive parent-child relationship and a positive sibling-child relationship generally results in the best developmental outcome and aides in the development of social understanding. Trends that have been observed by examining the parent-child and/or sibling-child relationships in isolation often do not tell the whole story, and sometimes even contradict the patterns found when examining both types of familial relationships together. Studies that take into account the greatest amount of factors in a child's socio-emotional environment yield the most complete results.

The Current Project

In light of the findings in the existing corpus of research, the current study will emphasize the inter-relatedness of various familial relationships as they affect development, as in Family Systems Theory. While it is clear that positive parent-child relationships are associated with more optimal behavioral outcomes for children, and similarly so for positive sibling relationships, the study of these relationships in combination is somewhat ambiguous. More clarity is needed on what effects occur when these relationship domains intersect. Further, the examination of sex composition as it relates to the previous factors has been insufficiently studied within the field. Therefore, all these factors will be considered together in the present investigation.

Hypotheses

Based on the parent-child and sibling relationship literature, the following hypotheses were examined: First low levels of sibling positivity rather than high levels of sibling negativity will be associated with more internalizing and externalizing behavior problems among children. Second, low levels of parental positivity and high levels of parental negativity will be associated with more internalizing and externalizing behavior problems. Additionally, sibling relationship quality will be a better predictor of behavioral outcomes than parent-child relationship quality. Finally, same-sex sibling pairs will have more similar behavioral outcomes than cross-sex sibling pairs, and sibling pairs with a male older sibling will exhibit more behavioral problems than sibling pairs with a female older sibling.

Method

Participants

Families with two children between the ages of six and 11 were recruited through fliers posted around the Minneapolis and Saint Paul areas, information distributed to Twin Cities parenting groups and private schools, and advertisements placed in a local parenting magazine. A total of 28 families,

each with two sibling participants and at least one parent participant, were tested. Each child was compensated for their participation with a gift card to Barnes and Noble Booksellers for $30.

All family types were invited to participate, including those with step, half, full, and adopted siblings, as well as twins. The majority of participating families were middle class (53.6% reporting an income of $60,000 or more per year; 85.7% of mothers and 64.7% of fathers attending at least some college) and Caucasian (60.7% for mothers, and 57.1% for children). In terms of biological relation, the majority (60.7%) of siblings were non-twin biological full siblings. The average age of the older siblings was 9.54 (*SD* = 1.73) years and 7.54 (*SD*= 1.32) years for the younger siblings. Mothers were a mean of 38.57 (*SD* = 3.94) years old at the time of their participation.

Procedure

Prior to the lab visit, parents completed various questionnaires assessing familial relationships and behavioral adjustment for both children. These included basic demographic information, the Child Behavior Checklist (CBCL- Achenbach, 1991), the Parent's Feelings Questionnaire (PFQ- Deater-Deckard, 2000), and the Sibling Relationship Questionnaire (SRQ Parent- Furman & Buhrmester, 1985).

During the lab visit, written consent was obtained from the parent and verbal assent was obtained from each child. The parent and each child engaged in two cooperative games (Etch-A-Sketch and Marble Labyrinth). For the Etch-A-Sketch task, the dyad was instructed to take as long as they needed to replicate two pictures (a two-layer cake and a house). The parent was instructed to use only one dial (vertical or horizontal), and the child only the other. The average time taken to complete the drawings was 7.63 minutes (*SD* = 3.55 minutes). During the second task, the Marble Labyrinth, the participants were instructed to work on the task for ten minutes total, once again only using one dial each. Once each dyad has completed the cooperative tasks, the parent and both siblings engaged in a

competitive task, Jenga, for 15 minutes. All interactions were digitally recorded to be coded by trained observers at a later date.

Parent behavior during parent-child interactions. The Parent-Child Interaction System (PARCHISY, Deater-Deckard, Pylas, & Petrill, 1997) was used to score parenting behavior during the parent-child interactive tasks. The PARCHISY is a global rating scheme used to code the following parenting behaviors: Positive Content/Control, Negative Content/Control, Positive Affect, Negative Affect, Responsiveness, On Task Behavior, and Verbalizations. Each behavior is rated on a seven-point Likert Scale. For the current study, all items of the PARCHISY were used with the exception of On Task Behavior and Verbalizations. A high Positive Control score would be characterized by frequent use of praise by the parent directed toward the child. A low Positive Control score would be characterized by frequent use of explicit directions by the parent, inhibiting the child from contributing their own strategy for the completion of the task. Negative Control is characterized by criticism and the physical interference of the parent with the child's actions. A low Negative Control score would indicate an absence of these behaviors. A high Positive Affect score is indicative of frequent smiling and/or laughing by the parent, while a high Negative Affect score is indicative of the parent using a cold or harsh voice to speak to the child and/or the presence of frequent frowning facial expressions. A high Responsiveness score is characteristic of a parent who responds to their child's comments quickly and without delay and who often expands on what they have to say. The lower the On Task score, the more distracted and unengaged the parent is on the task. The higher the On Task score, the more enthusiastic and focused the parent is on the task. Finally, a high Verbalizations score indicates a higher proportion of conversation and commenting by the parent relative to silence. To create a single parent score for each of the PARCHISY categories, the Etch-a-Sketch and Marble Labyrinth scores are *z*-scored and then averaged. Inter-rater reliability estimates range from .76 to .85 depending on the

particular scale.

Child behavior during sibling interactions. To examine the quality of the sibling interactions during the competitive triadic task (Jenga), a modified version of the scheme created by Stocker, Dunn, and Plomin for their 1989 study was used to score these interactions (please see Appendix A for a scoring key). Each child in the sibling pair was scored using a five-point Likert Scale in four categories: Conflict, Cooperation, Control, and Competition. Conflict included such behaviors as criticizing or protesting a sibling's actions or comments, and a higher score representing more of this behavior. Cooperation involved listening to suggestions offered by the sibling and engaging in novel play tasks within the larger interaction. A higher score represented the frequent presence of these behaviors. Control involved giving explicit directions to the sibling, physically interfering with the sibling turn, and other "bossy" behaviors. A higher score indicates more of this type of behavior. Finally, Competition was characterized by complaints about having the first turn in the game, making taunts about winning or losing to the sibling, and disrupting the parent-sibling interaction. Once again, a higher score represented more competitive behavior. Only behaviors by the target child directed specifically toward their sibling were scored for all categories.

Child Behavior Checklist. Parents completed the Child Behavior Checklist (CBCL-Achenbach, 1991) which assesses child problem behavior for children ages six to 18. The CBCL yields two higher-order dimensions of Internalizing (Anxious/Depressed, Withdrawn/Depressed, and Somatic Complaints) and Externalizing (Rule-Breaking Behavior, and Aggressive Behavior) along with a Total Problems Score (all items). The 113 items are scored on a three-point Likert Scale with higher scores indicating more problematic behavior.

Parent's Feelings Questionnaire. The Parent's Feelings Questionnaire (PFQ- Deater-Deckard, 2000) assesses parent's positive and negative feelings about his or her relationship with his or her child.

Subscale A consists of 24 statements with which one can agree or disagree on a five-point Likert Scale. An example of a positive statement is "*When I think about my child, it usually gives me warm feelings."* An example of a negative statement is "*My child and I argue or fight more than I would like to."* Subscale B consists of ten emotion words with which a parent may describe how she or he feels about her or his relationship with her or his child. For each item, the parent must rate the descriptiveness of the word on a ten-point Likert Scale. Two examples of such words are "*Hostile*" and "*Proud.*" Each subscale is *z*-scored and then averaged for a total positive/negative feelings score about the parent-child relationship.

Sibling Relationship Questionnaire. Parents completed The Sibling Relationship Questionnaire (SRQ- Furman & Buhrmester, 1985), a 48-item questionnaire scored on a five-point Likert Scale which assesses the quality of the sibling relationship along four dimensions: Warmth/Closeness (*How much does this sibling help _____ with things he or she can't do by him or herself?)*, Rivalry (*Some siblings try to out-do or beat each other at things a lot, while others don't. How much do ____ and this sibling try to out-do each other at things?*), Relative Status/Power (*How much does ___ order this sibling around?*) and Conflict (*How much do ____ and this sibling argue with each other?*). Warmth/Closeness is composed of seven subdimensions: Intimacy, Prosocial Behavior, Companionship, Affection, Similarity, Admiration of the Sibling, and Admiration by the Sibling. Rivalry is composed of the subdimension Parental Partiality. Relative Status/Power is composed of Nurturance of Sibling, Nurturance by Sibling, Dominance of Sibling, and Dominance by Sibling. Conflict is composed of three subdimensions: Quarreling, Antagonism, and Competition. In an investigation into the validity of the measure, Derkman, Scholte, Van der Veld, & Engels (2010) found good factorial and construct validity, and good internal reliability (Cronbach's α of 0.94 for Warmth/Closeness and 0.93 for Conflict).

Results

Descriptive Statistics

First, all measures were examined for skewness and kurtosis. The PARCHISY Responsiveness score was negatively skewed (skew = -2.295, *SD* = .319), showing that most parents were highly responsive to their children. However, this and the remaining variables were determined to be within an acceptable range. Please see Table 1 for variable descriptives.

Correlations Among Predictors

Next, the Pearson's Correlations between each measure were examined. Several correlations were significant among the parent measures. PARCHISY Positive Content was significantly correlated with PARCHISY Responsiveness (r (54) = .367, p .005) and PFQ Positivity (r (54) = .271, p = .043). PARCHIY Negative Content was significantly associated with PARCHISY Positive Affect (r (54) = -.353, p = .008),PARCHISY Negative Affect (r (54) = .721, p = .000), and PARCHISY Responsiveness (r (54) = -.331, p = .013). PARCHISY Positive Affect was significantly correlated with PARCHISY Negative Affect (r (54) = -.280, p = .037). PARCHISY Negative Affect was significantly correlated with PARCHISY Responsiveness (r (54) = –.310, p = .020). PARCHISY Responsiveness was significantly correlated with PFQ Negativity (r (54) = -.551, p = .000). PFQ Positivity was significantly correlated with PFQ Negativity (r (54) = -.551, p = .000). These correlations show that in general, positive parental aspects, whether identified through questionnaires or observational coding, are positively correlated to other positive parental aspects and negatively correlated to negative parental aspects.

There were also several significant correlations among the sibling measures. Jenga Conflict was significantly correlated with Jenga Cooperation (r (54) = -.348, p = .009), Jenga Control (r (54) = .442, p = .001), and Jenga Competition (r (54) = .483, p = .000). Jenga Control was significantly correlated

with Jenga Competition (r (54) = .297, p =.026), and SRQ Rivalry (r (54) = .267, p = .046). SRQ Warmth was significantly correlated with SRQ Conflict (r (54) = -.505, p = .000), and SRQ Rivalry (r (54) = -.368, p = .005). These correlations are similar to those for the parental measures in that aspects of sibling relationship positivity, whether identified through questionnaires or observational coding, are positively correlated to other positivity measures and negatively correlated to negativity measures.

As for correlations between parent-child and sibling measures, Jenga Control was significantly correlated with PARCHISY Negative Affect (r (54) = .386, p = .003). SRQ Warmth was significantly correlated to PFQ Negativity (r (54) = -4.00, p = .002). SRQ Conflict was significantly associated with SRQ Rivalry (r (54) = .405, p = .002), and PFQ Negativity (r (54) = .378, p = .004). SRQ Rivalry was also significantly correlated with PFQ Negativity (r (54) = .403, p = .002). Finally, SRQ Power was significantly correlated with PARCHISY Responsiveness (r (54) = -.296, p = .027). These correlations all suggest that negativity in one type of familial relationship is associated with negativity in another.

For the dependent measures, all the CBCL dimensions were significantly correlated with each other: Internalizing and Externalizing (r (54) = .606, p = .000), Internalizing and Total Problems (r (54) = .818, p = .000), and Externalizing and Total Problems (r (54) = .867, p = .000). For parent measures and outcomes, PFQ Positivity was significantly correlated with CBCL Externalizing (r (54) = -.332, p = .013) and CBCL Total Problems (r (54) = -.328, p = .014), showing that the more positive the parent-child relationship, the fewer behavioral adjustment problems children will exhibit. PFQ Negativity was significantly correlated with all CBCL dimensions: Internalizing (r (54) = .381, p = .004), Externalizing (r (54) = .532, p = .000), and Total Problems (r (54) = .503, p = .000). These correlations show that the more negativity in the parent-child relationship, the poorer the adjustment outcomes of the children. For the sibling relationship and outcomes, SRQ Warmth was significantly correlated with CBCL Internalizing (r (54) = -.288, p = .033), and CBCL Externalizing (r (54) = -.363, p = .006), showing that

the more positivity reported in the sibling-child relationship, the fewer internalizing and externalizing behavior problems children will exhibit. SRQ Conflict was significantly correlated with all CBCL dimensions: Internalizing (r (54) = .507, p = .000), Externalizing (r (54) = .540, p = .000), and Total Problems (r (54) = .549, p = .000). This shows that negativity, as conflict, in the sibling relationship is associated with poorer adjustment outcomes. SRQ Rivalry was also significantly correlated with all CBCL dimensions: Internalizing (r (54) = .291, p = .031), Externalizing (r (54) = .279, p = .039), and Total Problems (r (54) = .293, p = .030). This once again suggests that negativity, this time as rivalry, in the sibling relationship is associated with poorer adjustment outcomes.

Hierarchical Linear Regressions

In the original data analysis plan, composite scores were to be created for Parental Positivity (PARCHISY Positive Control, Positive Affect, and Responsiveness, and PFQ Positivity) and Parental Negativity (PARCHISY Negative Control, and Negative Affect, and PFQ Negativity), and for Sibling Positivity (Jenga Cooperation, and SRQ Warmth) and Sibling Negativity (Jenga Conflict, Control, and Competition, and SRQ Power, SRQ Conflict, and SRQ Rivalry). Although several of these items were significantly correlated, upon further examination, the Cronbach α's were .40-.45. Therefore, each item was used as an independent predictor.

A series of hierarchical linear regression was conducted to examine the predictive power of parental positivity and negativity and sibling relationship quality for children's adjustment (See Table 2). For each model, child age and sex were entered in step one. Next, parental positivity and negativity as assessed via the PARCHISY and the PFQ Step were entered. For the Internalizing Behavior Problems model, step one approached significance (F (1, 2) = 2.727, p = .075, R = .308, R^2 = .095). Child age was a significant predictor of internalizing behavior problems (β = .302, t = 2.26, p = .028), which indicates that older children were rated as having more internalizing problems than younger

children. Step two was not significant (F (1, 9) = 1.145, p = .352, R = .432, R^2 = .186). Step three also approached significance (F (1, 17) = 1.785, p = .070, R = .671, R^2 = .451). SRQ Conflict was a significant predictor of internalizing behavior (β = .536, t = 3.11, p = .004), which indicates that greater reported sibling conflict predicted more internalizing problems during middle childhood.

For the Externalizing Behavior Problems model, step one approached significance (F (1, 2) = 2.789, p = .071, R = .311, R^2 = .097). Child age was a significant predictor of externalizing behavior problems (β = .315, t = 2.36, p = .022), which indicates that older children were rated as having more externalizing problems than younger children. Step two was significant (F (1, 9) = 2.473, p = .022 R = .575, R^2 = .331). PFQ Negativity was a significant predictor of externalizing behavior problems (β = .427, t = 2.59, p = .013), which indicates that when parents reported more negative feelings about the parent-child relationship, their children had more externalizing problems. Step three also was significant (F (1, 17) = 2.401, p = .013, R = .724, R^2 = .525). SRQ Conflict was a significant predictor of externalizing behavior problems (β = .414, t = 2.58, p = .014), which indicates that parents who reported higher levels of conflict in their children's sibling relationship also reported their children as having more externalizing behavior problems.

For the Total Problems model, step one was significant (F (1, 2) =3.519, p = .037, R = .345, R^2 = .119). Child age was a significant predictor of total problem behaviors (β = .348, t = 2.64, p = .011), which indicates that older children were rated as having more total problem behaviors than younger children. Step two was also significant (F (1, 9) = 2.253, p = .035, R = .557, R^2 = .311). PFQ Negativity was a significant predictor of total problem behaviors (β = .344, t = 2.06, p = .046), which indicates that when parents reported more negative feelings about their parent-child relationship, the children had more total problem behaviors. Finally, step three was significant as well (F (1, 17) = 2.211, p = .022, R = .710, R^2 = .504). This means that the quality of the sibling relationship affects behavioral adjustment

outcomes above and beyond all other predictive factors. SRQ Conflict was a significant predictor of total problem behaviors (β = .516, t = 3.15, p = .003), which indicates that parents who reported higher levels of conflict in their children's sibling relationship also reported their children as having more total problem behaviors.

Fisher's r to *z* Analyses

To test the hypothesis that same-sex siblings will have more similar CBCL scores than opposite-sex siblings, a series of *Fisher's r to z* analyses was conducted. The correlations for internalizing behavior problems for same-sex sibling pairs (r (54) = .495) and for opposite-sex sibling pairs (r (54) = .385) were not significantly different *(Fisher's r to z* = .30, p = .382). The correlations for externalizing behavior problems for same-sex pairs (r (54) = .388) and opposite-sex sibling pairs (r (54) = .310) were not significantly different *(Fisher's r to z* = .20, p = .421). Finally, the correlations for total problems for same-sex pairs (r (54) = .413) and opposite-sex sibling pairs (r (54) = .561) were not significantly different *(Fisher's r to z* = -.43, p = .334). Therefore, same-sex sibling pairs were not found to be more similar than opposite-sex sibling pairs on parental ratings of internalizing, externalizing, or total behavioral problems based on the CBCL.

Independent Samples *t*-Tests

To test the hypothesis that sibling pairs with older brothers, versus older sisters, are associated with higher CBCL scores for both children, independent samples *t*-tests were conducted. Twins (N = 12) were excluded from this section of analysis. When the internalizing behavior problems of sibling pairs with older male children (M = 52.06, SD = 9.74) were compared to those of sibling pairs with older female children (M = 48.26, SD = 10.70), no significance differences were found (F (1, 41) = .096, t (41) = 1.16, p =.758). Likewise, when the externalizing behavior problems of sibling pairs with older male children (M = 51.25, SD = 10.43) were compared to those of sibling pairs with older female

children (M = 49.33, SD = 10.67), no significance differences were found (F (1, 41) = .010, t (41) = 0.57, p =.921). Finally, when the total problem behaviors of sibling pairs with older male children (M = 50.25, SD = 10.43) were compared to those of sibling pairs with older female children (M = 47.67, SD = 12.01), no significance differences were found (F (1, 41) = .477, t (41) = 0.72, p =.494). Although no significant mean differences were found on the CBCL, when males versus females were the oldest child in the sibling pair, the pattern of results was in the expected direction.

Discussion

Research on the effects of familial relationships on child development has reached two consistent and robust conclusions. In general, the better the quality of the parent-child relationship, the more optimal the adjustment outcomes of the children will be (Bank et al., 2004; NICHHDECCRN, 2004; Williams, L.R. et al., 2009). Similarly, the better the quality of the sibling-child relationship, generally the more optimal the adjustment outcomes of the children (Bank et al., 2004; Brody, 2004; Richmond et al., 2005). When these two types of familial relationships are examined as interactive forces in a child's development, there is an emerging conclusion that the sibling-child relationship has more predictive power than the parent-child relationship (Bank et al., 2004; Gass et al. 2007; Stocker et al. 2002). Yet the nuances of this trend are not yet fully understood. Further, there is evidence that sibling sex composition can affect relationship quality, and therefore adjustment outcomes as well (Abramovitch et al., 1980; Dunn & Kendrick, 1981; Richmond et al. 2005; Stocker et al. 2002; Williams, S.T. et al., 2007). However, the exact mechanisms of this influence are still under investigation. To attempt to fill in these gaps, the current study examined the combined effects of the qualities of the parent-child and sibling-child relationships, and sibling sex composition on internalizing and externalizing development in middle childhood.

The current study yielded many significant correlations between measures from various

predictive categories. PFQ Positivity had negative correlations to CBCL Externalizing and Total Problems, suggesting that positive parent-child relationships (as assessed by questionnaires) are associated with fewer behavioral problems in children. PFQ Negativity had positive correlations to CBCL Internalizing, Externalizing, and Total Problems, suggesting that negative parent-child relationships (as assessed by questionnaires) are associated with more behavioral problems in children. Together, these findings support those found in the literature, that the better the relationship between parents and children, the better the adjustment outcomes of the children (Williams, L.R. et al., 2009). They also support the hypothesis that low levels of parental positivity and high levels of parental negativity will be associated with more internalizing and externalizing behavior problems in children.

For the sibling relationship, SRQ Warmth was negatively correlated with CBCL internalizing and externalizing, suggesting that positive sibling-child relationships (as assessed by questionnaires) are associated with fewer behavioral problems in children. Both SRQ Conflict and Rivalry were positively correlated with CBCL internalizing, externalizing, and total behavioral problems, suggesting that negative sibling-child relationships (as assessed by questionnaires) are associated with more behavioral problems in children. Together, these findings support those found in the literature, that the better the relationship between siblings, the better the adjustment outcomes of both children (Bank et al., 2004). However, they nullify the hypothesis that low levels of sibling positivity rather than high levels of sibling negativity will be associated with more internalizing and externalizing behavior problems among children. In fact, the sibling- child relationship matched the parent-child relationship in that both positivity and negativity affect the relationship quality.

As for interactions between relationship types, SRQ Conflict and Rivalry both had positive correlations to PFQ Negativity, suggesting that negative sibling-child relationships are associated with negative parent-child relationships. Further, SRQ Warmth had a negative correlation to PFQ Negativity,

suggesting that negative parent-child relationships are not associated with positive sibling-child relationships. These findings support the literature that states that siblings model their relationships with each other after their relationships with their parents in respect to quality (Brody, 1998).

The hierarchical linear regressions yielded many significant findings. The most important was that the sibling relationship quality explained additional variance above and beyond that of parent-child relationship quality. This corresponds to findings of the literature (Bank et al., 2004; Gass et al., 2007; Stocker et al., 2002) and supports the hypothesis that sibling relationship quality will be a better predictor of behavioral outcomes than parent-child relationship quality. However, the qualities of both the parent-child and sibling relationships are still important for explaining individual differences in adjustment. Having both a negative parent-child relationship and a negative sibling relationship would likely be associated with the worst outcome.

As for the specific coefficients used as predictors in the hierarchical linear regressions, PFQ Negativity was the only parent factor to yield any significance. This does not contradict any findings or hypotheses. However, the only significant sibling predictor was SRQ Conflict, an aspect of negativity. The significance of this predictor in the absence of any significant positivity predictors runs contrary to the literature (Dunn et al., 1994) and hypotheses. That being said, if negativity in the sibling relationship is to be a significant predictor of adjustment, one would expect that it predicts worse outcomes, rather than more optimal ones, which it does. So the effects are at least in the predicted direction. The fact that outcomes were predicted only by negative measures in each relationship type seems to indicate that negativity rather than positivity is the best measure of relationship quality.

Both sex composition hypotheses had to be rejected. The *Fisher's r* to *z* tests investigating the hypothesis that same-sex sibling pairs will have more similar behavioral outcomes than cross-sex sibling pairs yielded no significance. If anything, it showed that siblings simply tended to have

behavioral adjustment scores moderately correlated to each other's, regardless of sex composition. Perhaps this is once again evidence of the power of the quality of the sibling relationship; it is that shared factor between them that affects outcomes more than anything else. The independent samples *t*-tests investigating the hypothesis that sibling pairs with a male older sibling will exhibit more behavioral problems than sibling pairs with a female older sibling also failed to reach significance, but the trends were in the predicted directions. An interesting future investigation would be into whether any male in a sibling pair, regardless of birth order, affects the adjustment outcomes of both children, or if problem behaviors within a sibling pair increase with the addition of every male (female-female pairs with the least, cross-sex pairs with moderate amounts, and male-male pairs with the most, etc.).

Reasons for the lack of significant results could be several. First, there is the small size of the sample. Considering the directions of the trends, perhaps if more participants had been included in analysis, adequate statistical power could have been reached. This is especially true of the *t*-tests because all twins were removed from this analysis (since twins do not have older or younger status in a sibling pair), therefore reducing the *N* even more.

Second, one of the unexpected developments of this study was that the various predictive elements of theoretical constructs (Ex: the Parent's Feeling Questionnaire and observational coding for the concept of "Positive Parental Relationship") did not hang together. While it was possible to use every coefficient as an individual predictor, these results may be different from what may have occurred with composite scores. Further, without the categories of Positive Parent, Negative Parent, Positive Child, and Negative Child, certain interactions were not able to be examined. Developing measures that form more cohesive theoretical groups such as these would help future studies investigate more complex aspects of familial relationships and development.

Third, there were not any observational measures from either parent or sibling interactions that

yielded any significant correlations to any CBCL dimension or that served as any significant predictor in the regressions. This suggests that the questionnaire measures are better at targeting the type of data relevant to the outcome measures than the observational measures are. They likely did not accurately capture the theoretical concepts. For example, the only observational category for sibling positivity was Cooperation. This mainly involved responding to suggestions and reciprocating during novel play tasks. Affective positivity, such as smiling and laughing, which is coded in the parental categories, was not taken into account. Perhaps if the sibling and parent coding schemes were more parallel, the results found in the literature would have been replicated in this study. In general, if any of the behavioral coding schemes were not descriptive enough or did not generate enough distinction within the sample, the analysis did not yield significant results.

Finally, the nature of the tasks differed between the parental dyadic interactions and the triadic parent-child-sibling interactions. The Etch-A-Sketch and Marble Labyrinth tasks, which are only completed with the parent and each child separately, are designed as cooperative tasks. Communication and teamwork are imperative for strategizing in these interactions. Jenga, however, is a competitive game in which each player is competing against every other player, and winning or losing is an individual accomplishment. Therefore, a different outcome in patterns observed between cooperating parents and children, and competing siblings is not inexplicable. Future studies should use methodologies in which both the parent and the sibling interactions are similar in nature and provide equal opportunity for participants to engage in both cooperative (positive) and competitive (negative) tasks and behaviors.

This study had many strengths. In particular, its multi-informant, multi-method approach removed many of the biases often found in this area of research. However, due to the labor-intensive nature of the investigation and the somewhat limiting conditions of participation (families must contain

two children within a six year age range), mustering a large enough sample proved to be one of the studies main limitations. Especially because the sex-dependent analyses divided the sample into four different groups based on age order and sex composition, in addition to excluding a portion of the sample (twins), there was simply was insufficient power to detect anything but large effects.

In conclusion, this study was concerned with investigating the interactive, synergistic effects of the qualities of parent-child and sibling-child relationships on socio-emotional development in middle childhood. The findings show that the outcomes are of a complexity and interdependence that would never have been discovered without examining familial relationships in their interwoven, Family Systems Theory-style, mutually-influenced environment. Positive parent-child relationships are associated with optimal behavioral adjustment, as are positive sibling-child relationships. Yet this study shows that even for those without the fortune of having a positive parent-child relationship, by fostering a positive relationship with their sibling, brother or sister, older or younger, healthy socio-emotional adjustment may yet be their course of psychological development.

References

Abramovitch, R., Corter C., & Pepler, D.J. (1980). Observations of mixed-sex sibling dyads. *Child Development, 51*(4), 1268-1271. doi: 0009-3920/80/5104-0037

Achenbach, T. M. (1991). *Child Behavior Checklist (6-18)*. Burlington, VT: University of Vermont, Research Center for Children, Youth, and Families.

Bank, L., Burraston, B., & Snyder, J. (2004). Sibling conflict and ineffective parenting as predictors of adolescent boys' antisocial behavior and peer difficulties: Additive and interactional effects. *Journal of Research on Adolescence, 14*(1), 99-125. doi: 10.1111/j.1532-7795.2004.01401005.x

Brody, G.H. (1998). Sibling relationship quality: Its causes and consequences. *Annual Review of Psychology, 49*(1), 1-24. doi: 0066-4308/98/0201-0001

Brody, G.H. (2004). Siblings' direct and indirect contributions to child development. *Current Directions in Psychological Science, 13*(3), 124-126. doi: 10.1111/j.0963-7214.2004.00289.x

Brody, G.H., Stoneman, Z., & Gauger, K. (1996). Parent-child relationships, family problem-solving behavior, and sibling relationship quality: The moderating role of sibling temperaments. *Child Development, 67*(3), 1289-1300. doi: 0009-3920/96/6703-0032

Brody, G.H., Stoneman, Z., MacKinnon, C.E., & MacKinnon, R. (1985). Role relationships and behavior between preschool-aged and school-aged sibling pairs. *Developmental Psychology, 21*(1), 124-129. doi: 10.1037/0012-1649.21.1.124

Cox, M.J., Paley, B. (2003). Understanding families as systems. *Current Directions in Psychological Science, 12*(5), 193-196. doi: 10.1111/1467-8721.01259

Deater-Deckard, K. (2000). Parenting and child behavioral adjustment in early childhood: A quantitative genetic approach to studying family processes. *Child Development, 71*(2), 468-

484. doi: 10.1111/1467-8624.00158

Deater-Deckard, K., Pylas, M.V., & Petrill, S.A. (1997). *Parent-Child Interaction System (PARCHISY).* London, UK: Institute of Psychiatry.

Derkman, M.M.S., Scholte, R.H.J., Van der Veld, W.M, & Engels, R.C.M.E. (2010). Factorial and construct validity of the sibling relationship questionnaire. *European Journal of Psychological Assessment, 26*(4), 277-283. doi: 10.1027/1015-5759/a000037

Dunn, J. (1992). Siblings and development. *Current Directions in Psychological Science, 1*(1), 6-9.

Dunn, J., & Kendrick, C. (1981). Social behavior of young siblings in the family context: Differences between same-sex and different-sex dyads. *Child Development, 52*(4), 1265-1273. doi: 0009-3920/81/5204-0017

Dunn, J., Slomkowski, C., Beardsall, L., & Rende, R. (1994). Adjustment in middle childhood and early adolescence: Links with earlier and contemporary sibling relationships. *Journal of Child Psychology and Psychiatry, 35*(3), 491-504. doi: 0021-9630/94

Fleming, W.M. (2003). Family systems theory. In *The International Encyclopedia of Marriage and Family.* Retrieved from http://www.encyclopedia.com/topic/Family_Systems_Theory.aspx#1

Furman, W. & Buhrmester, D. (1985). *Sibling Relationship Questionnaire*. Ann Arbor, MI: Society for Research in Child Development.

Gaines, S.O., Rugg, M.A., Zemore, S.E., Armm, J.L., Yum, N., Law, A., ...Feldman, K. (1999). Gender-related personality traits and interpersonal resource exchange among brother-sister relationships. *Personal Relationships, 6*(2), 187-198. doi: 1350-4126/99

Gass, K., Jenkins, J., & Dunn, J. (2007). Are sibling relationships protective? A longitudinal study. *Journal of Child Psychology and Psychiatry, 48*(2), 167-175. doi: 10.1111/j.1469-7610.2006.01699.x

Hines, D.A., Kantor, G.K., Holt, M.B. (2006). Similarities in siblings' experiences of neglectful parenting behaviors. *Child Abuse and Neglect, 30*(6), 619-637. doi: 10.1016/j.chiabu.2005.11.008

Kaczynski, K.J., Lindahl, K.M., Malik, N.M., & Laurenceau, J. (2006). Marital conflict, maternal and parental parenting, and child adjustment: A test of mediation and moderation. *Journal of Family Psychology, 20*(2), 199-208. doi: 10.1037/0893-3200.20.2.199

Klein, P.S., Feldman, R., Zarur, S. (2002). Mediation in a sibling context: The relations of older siblings' mediating behaviour and younger siblings' task performance. *Infant and Child Development, 11*(4), 321-333. doi: 10.1002/icd.261

Levesque, R.J.R. (2014). Externalizing and internalizing symptoms. In *Encyclopedia of Adolescence*. Retrieved from http://link.springer.com/referenceworkentry/10.1007%2F978-1-4419-1695-2_539

McCoy, J.K., Brody, G.H., & Stoneman, Z. (2002). Temperament and the quality of best friendships: Effect of same-sex sibling relationships. *Family Relations, 51*(3), 248-255. doi: 10.1111/j.1741-3729.2002.00248.x

McHale, S.M., & Crouter, A.C. (1996). The family contexts of children's sibling relationships. *10*, 173-195.

Munn, P., & Dunn, J. (1989). Temperament and the developing relationship between siblings. *International Journal of Behavioral Development, 12*(4), 433-451. doi: 10.1177/016502548901200402.

National Institute of Child Health and Human Development Early Child Care Research Network, (2004). Fathers' and mothers' parenting behavior and beliefs as predictors of children's social adjustment in the transition to school. *Journal of Family Psychology, 18*(4), 628-638. doi:

10.1037/0893-3200.18.4.628

Pike, A., Coldwell, J., & Dunn, J.F. (2005). Sibling relationships in early/middle childhood: Links with individual adjustment. *Journal of Family Psychology, 19*(4), 523-532. doi: 10.1037/0893-3200.19.4.523

Renk, K., Roddenberry, A., Oliveros, A., & Sieger, K. (2007). The relationship of maternal characteristics and perceptions of children to children's emotional and behavioral development. *Child and Family Behavior Therapy, 29*(1), 37-57. doi: 10.1300/J019v29n01_03

Richmond, M.K., Stocker, C.M., Rienks, S.L. (2005). Longitudinal associations between sibling relationship quality, parental differential treatment, and children's adjustment. *Journal of Family Psychology, 19*(4), 550-559. doi: 10.1037/0893-3200.19.4.550

Segal, N. L., Connelly, S. L., Topoloski, T. D. (1996). Twin children with unfamiliar partners: genotypic and gender influences on cooperation. *Journal of Child Psychology and Psychiatry, 37*(6), 731-735. doi: 0021-9630/96

Steelman, L.C., Powell, B., Werum, R., & Carter, S. (2002). Reconsidering the effects of sibling configuration: Recent advances and challenges. *Annual Review of Sociology, 28,* 243-269. doi: 10.1146/annurev.soc.28.111301.093304

Stocker, C.M. (1993). Siblings' adjustment in middle childhood: Links with mother-child relationships. *Journal of Applied Developmental Psychology,14*, 485-499.

Stocker, C.M., Burwell, R.A., & Briggs, M.L. (2002). Sibling conflict in middle childhood predicts children's adjustment in early adolescence. *Journal of Family Psychology, 16*(1), 50-57. doi: 10.1037//0893-3200.16.1.50

Stocker, C.M., Dunn, J., & Plomin, R. (1989). Sibling relationships: Links with child temperament,

maternal behavior, and family structure. *Child Development, 60*, 715-727. doi: 0009-3920/89/6003-0014

Stoneman, Z., & Brody, G.H. (1993). Sibling temperaments, conflict, warmth, and role asymmetry. *Child Development, 64*(6), 1786-1800. doi: 0009-3920/93/6406-0010

Stoneman, Z., Brody, G.H., & MacKinnon, C.E. (1986). Same-sex and cross-sex siblings: Activity choices, roles, behaviors, and gender stereotypes. *Sex Roles, 15*(9-10), 495-511. doi: 0360-0025/86/1100-0495

Tucker, C.J., & Updegraff K. (2009). The relative contributions of parents and siblings to child and adolescent development. *New Directions for Child and Adolescent Development, 126,* 13-28. doi: 10.1002/cd

van Ijzendoorn, M.H., Moran, G., Belsky, J., Pederson, D., Bakerman-Kranenburg, M.J., & Kneppers, K. (2000). The similarity of siblings' attachment to their mother. *Child Development, 71*(4), 1086-1098. doi: 0009-3920/2000/7104-0024

Williams, S.T., Conger, K.J., & Blozis, S.A. (2007). The development of interpersonal aggression during adolescence: The importance of parents, siblings, and family economics. *Child Development, 78*(5), 1526-1542. doi: 0009-3920/2007/7805-0008

Williams, L.R., Degnan, K.A., Perez-Edgar, K.E., Henderson, H.A., Rubin, K.H., Pine, D.S., … Fox, N.A. (2009). Impact of behavioral inhibition and parenting style on internalizing and externalizing problems from early childhood through adolescence. *Journal of Abnormal Child Psychology, 37,* 1063-1075. doi: 10.1007/s10802-009-9331-3

Table 1. Descriptives of Variables.

Item	Mean (SD)	Range
Parent Questionnaire Measures		
PFQ Positivity	6.49 (0.53)	4.68-7.32
PFQ Negativity	2.98 (1.17)	1.00-6.96
Parent Observational Measures		
Positive Content/Control	4.40 (0.99)	2-6.5
Negative Content/Control	1.85 (0.74)	1-3.5
Positive Affect	3.71 (1.01)	1.5-6.5
Negative Affect	1.51 (0.58)	1-3
Responsiveness	5.79 (0.77)	2-7
Sibling Questionnaire Measures		
SRQ Warmth	3.51 (0.60)	2.38-4.43
SRQ Conflict	2.92 (0.81)	1.33-4.44
SRQ Power	0.23 (1.21)	-3.00-5.00
SRQ Rivalry	0.46 (0.37)	0.00-1.17
Sibling Observational Measures		
Conflict	2.04 (0.63)	1-4
Cooperation	2.52 (0.83)	2-5
Control	2.09 (.077)	1-4
Competition	2.64 (0.70)	2-4
Dependent Meaures		
Internalizing	49.58 (9.98)	33-66
Externalizing	49.62 (10.03)	33-73
Total Problems	48.56 (10.59)	25-72

Table 2. Coefficients of Hierarchical Linear Regressions.

	Internalizing			**Externalizing**			**Total Problems**		
Model	*β*	*t*	*p*	*β*	*t*	*p*	*β*	*t*	*p*
Step 1		5.57	**.000****		5.13	**.000****		4.65	**.000****
Child Age	.302	2.26	**.028****	.315	2.36	**.022****	.348	2.64	**.011****
Child Sex	-.126	-0.94	.350	-.047	-0.35	.727	-.093	-0.70	.486
F (1, 2) = 2.73, *p* = **.075***, R^2 = .095; *F*(1, 2) = 2.79, *p* = **.071*** R^2 = .097; *F*(1, 2) = 3.52, *p* = **.037****; R^2 = .119									
Step 2		1.68	.101		1.36	.181		1.27	.210
Child Age	.206	1.21	.233	.159	1.03	.309	.236	1.51	.139
Child Sex	-.082	-0.57	.572	.026	0.20	.845	-.029	-0.22	.830
Positive Control	.018	0.12	.908	-.076	-0.53	.596	-.012	-0.09	.933
Negative Control	.046	0.22	.828	.135	0.71	.479	.189	0.98	.331
Positive Affect	.056	0.37	.711	-.061	-0.45	.656	-.017	-0.12	.906
Negative Affect	-.059	-0.29	.773	-.029	-0.16	.877	-.063	-0.34	.739
Responsiveness	.000	0.00	1.00	.048	0.31	.757	.046	0.29	.772
PFQ Positivity	-.116	-0.66	.510	-.046	-0.29	.775	-.100	-0.62	.539
PFQ Negativity	.235	1.29	.203	.427	2.59	**.013****	.344	2.06	**.046****
F(1, 9) = 1.15, *p* = .352, R^2 = .186; *F*(1, 9) = 2.47, *p* = **.022****, R^2 = .331; *F*(1, 9) = 2.25, *p* = **.035****, R^2 = .311									
Step 3		0.19	.985		1.13	.265		0.04	.967
Child Age	.078	0.47	.644	-.001	-0.01	.994	.117	0.74	.464
Child Sex	-.128	-0.79	.433	.103	0.69	.496	.015	0.10	.922
Positive Control	-.172	-1.05	.300	-.164	-1.08	.288	-.170	-1.09	.282
Negative Control	.002	0.01	.993	.245	1.31	.198	.210	1.10	.279
Positive Affect	.141	0.93	.358	.095	0.68	.501	.129	0.90	.373
Negative Affect	.076	0.37	.712	-.109	-0.57	.569	-.034	-0.18	.861
Responsiveness	.137	0.82	.416	.081	0.52	.607	.107	0.68	.502
PFQ Positivity	.038	0.22	.830	-.098	-0.59	.556	-.064	-0.38	.706
PFQ Negativity	.158	0.84	.404	.275	1.57	.125	.252	1.41	.166
Conflict	.064	0.37	.711	.166	1.05	.302	.121	0.75	.459
Cooperation	-.162	1.11	.273	.023	0.17	.868	-.018	-0.13	.897
Control	.127	0.74	.463	-.281	-1.77	**.086***	-.103	-0.63	.532

Table 2. Coefficients of Hierarchical Linear Regressions (Continued).

Competition	.113	0.71	.481	.024	0.16	.870	.087	0.58	.568
SRQ Warmth	.116	0.61	.543	-.077	-0.44	.664	.135	0.75	.457
SRQ Power	.200	1.30	.200	.012	0.08	.934	.003	0.02	.983
SRQ Conflict	.536	3.11	**.004****	.414	2.58	**.014****	.516	3.15	**.003****
SRQ Rivalry	-.058	-0.36	.725	-.009	-0.06	.951	-.007	-0.05	.964
$F(1, 17) = 1.79$, $p = .$**070***, $R^2 = .451$; $F(1, 17) = 2.40$, $p =$ **.013****, $R^2 = .525$; $F(1, 17) = 2.21$, $p =$ **.022****, $R^2 = .504$									

Note: *$p < .10$. ** $p < .05$.

Appendix A.
Behavioral Coding Scheme for Sibling Interactions (modified from Stocker, Dunn, & Plomin, 1989).

1. Conflict
    1. No physical aggression or teasing, no verbal hostility, no protests or disputes.
    2. A few instances (less than half the time) of physical aggression or teasing or verbal hostility.
    3. Moderate amounts (about half the time) of physical aggression or teasing with some verbal hostility or protesting.
    4. Substantial amounts (more than half the time) of physical aggression and lots of teasing, some criticism of other's actions.
    5. Intense aggression, physical aggression, frequent criticism of other's actions.

2. Cooperation
    1. No attempts to cooperate, refusal to cooperate or follow suggestions.
    2. A few attempts to cooperates (less than half the time), or refuses to cooperate more than half the time.
    3. Moderate amounts (about half the time) of cooperation and following suggestion.
    4. Cooperates more than half the time and refuses to cooperate or follow suggestions less than half the time.
    5. Frequent attempts to cooperate with sibling, responds promptly to suggestions or questions, frequent sustained conversation, innovative suggestions for cooperative play.

3. Control
    1. No controlling, bossy, or directive statements, no physical acts of interference with other's actions.
    2. A few instances (less than half the time) of controlling or bossy behavior.
    3. Moderate amounts (about half the time) of controlling or bossy behavior and some physical acts of interference.
    4. Bossy and controlling behavior for more than half the time and physical acts of interference.
    5. Frequent bossy, directive or controlling comments, physical interference with sibling's play, takes over sibling's play.

4. Competition
    1. No signs of rivalry or competitiveness, no competitive statements, no complaints about turns, no disruption of mother-sibling interaction.
    2. A few instances (less than half the time) of rivalry or competitiveness, competitive statements, complaints about turns, and/or disruption of mother-sibling interaction.
    3. Moderate amounts (about half the time) of rivalry or competitiveness.
    4. Competitive more than half the time, many complaints about turns and some aggression about winning.
    5. Frequent signs of above, aggression in winning, mocking remarks about sibling to mother.