ADOLESCENT SIBLING RELATIONSHIPS AND DISORDERED EATING

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ABSTRACT

Researchers have begun to explore the role that family members play in maintaining or recovering from an eating disorder. However, little research has addressed the sibling relationship, including nurturance, quarreling, and favoritism. Self-report questionnaires were collected from 120 girls and 87 boys in middle school (N=161) or high school (N=46). Linear regressions, ANOVAs and mediation analyses were conducted to determine the effects of siblings on adolescents' disordered eating. Sibling favoritism and modeling of bulimic behavior were the only variables significantly related to relationship quality. Our results indicate that family dynamics and structure may play a larger role in adolescent maladaptive behavior than sibling relationship quality. Additionally, sibling relationship quality, bulimic modeling and sibling favoritism may be part of a very complex process leading to disordered eating behavior. Future research should continue to utilize the sibling subsystem as a means of understanding the development of disordered eating behavior among adolescents.

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ADOLESCENT SIBLING RELATIONSHIPS AND DISORDERED EATING

It should come as no surprise to family researchers and those in the mental health discipline that eating disorders constitute a serious problem in today's society. With the increased rates of obesity and emphasis on thinness in industrialized countries, teens and young adults are susceptible to body dissatisfaction and disordered eating. Eating disorders have existed for centuries, but in the United States they have been steadily increasing since the 1970's. The most recent version of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR) estimates that approximately 2-4% of the female population are battling Anorexia (AN), Bulimia (BN) or a combination of the two (APA,2000). This does not account for the numerous cases that go undocumented due to the secretive nature of the disorder. While 90% of documented eating disorders impact women, disordered eating among men is still an issue and continues to increase (APA, 2000). Medical complications have been connected with eating disorders including hair loss, osteoporosis, gastrointestinal dysfunction, and cardiac arrest (Klump, Bulik, Kaye, Treasure & Tyson, 2009). Eating disorders are also closely linked with mental health, including negative impacts on social and emotional well being (Vega, Rasillo, Alonso, Carretero & Martin, 2005.) This may result in a higher susceptibility to peer relational issues, isolation, suicidal thoughts, mood disorders and other internalizing behaviors (Vega et al., 2005). As adolescence is an important time for physical, hormonal, emotional, and cognitive development, potential effects of an eating disorder during this time can be damaging and even deadly (Vega et al., 2005).

Eating disorders constitute a pervasive societal problem which has caught the attention of researchers, clinicians and family members due to the destructive nature of the disorder on physical and emotional health. Researchers have acknowledged the role that family members

may play in the perpetuation of disordered eating, but little attention has been paid to sibling relationships even though this dyad can set the stage for prosocial development and is one of the longest and most significant relationships an individual may have. Therefore, the purpose of the present study was to closely examine the connections between adolescent sibling relationships and disordered eating behaviors.

Theoretical Framework

Two main theories guided the conceptualization of this project and the subsequent hypotheses. First, family systems theory guided the connection between families and disordered eating. More specifically, from a systems perspective, families work as an arrangement of interconnected relationships which all influence one another. An eating disorder in one family member may likely be the result of disruption within the larger family system. We also hope to expand the current theoretical basis of family systems theory by examining the complexity of the family while also considering the uniqueness of the sibling subsystem with a focus on specific sibling behaviors including nurturance, quarreling, and parental favoritism of a sibling. Second, this paper utilizes feminist theory as an overall lens from which to view the problem of disordered eating. This theory initially guided us in examining the disproportionate rates of disordered eating among females. Further, a major tenet of feminist theory considers the way power differences influence relationships and problems within larger society. Because we examined gender and age differences in sibling relationships, feminist theory will also serve as a mechanism to make sense of the study's results.

Disordered Eating

To date, most of the current research examining eating disorders and family relationships focuses on patients with clinical level symptoms who meet the diagnostic criteria for an eating

disorder and are receiving inpatient care (Benninghoven, Tetsch & Jantscheck, 2008; Honey, at al., 2006; Karwautz, et al., 2003). Eating disorders are considered clinical disorders because upon diagnosis they should be the primary focus of clinical attention and receive immediate attention due to their serious nature (Andreasen & Black, 2006). The DSM-IV-TR organizes disorders based on a multi-axial system with axis 1 representing serious clinical disorders that greatly disturb everyday functioning (APA, 2000). Due to their significant and detrimental impact on physical and emotional well being, Anorexia Nervosa (AN) and Bulimia Nervosa (BN) are both classified in the DSM-IV-TR as axis I disorders. AN is described as a condition in which an individual fails to maintain a body weight of at least 85% of what is expected for his or her age and height (APA, 2000). This disorder also includes fear of gaining weight, starvation and a disturbed body image. BN involves inappropriate methods of maintaining or losing weight through the use of binging and purging. Purging generally includes the use of self-induced vomiting, laxative use or excessive exercise (APA, 2000).

The distinction between clinical and subclinical level symptoms of eating disorders is not always clear, however. For example, individuals with subclinical symptoms can experience significant distress regarding body weight and shape yet do not meet the diagnostic criteria for a full blown, clinical eating disorder (Jenkins, Rienecke Hoste, Meyer & Blissett, 2011). There has been concern that the current diagnostic criteria excludes a significant number of individuals with subclinical level symptoms who experience severe distress but do not meet all the diagnostic criteria for the disorder (Bunnel, Shenker, Nussbaum, Jacobson & Cooper, 1989). For example, in a study examining college-aged dieters with subclinical levels of dieting, it was found that 15% had moved into the "probable bulimic" category by the following semester (Franko & Omiro, 1999). The probable bulimic category represented those who reported

bingeing and vomiting or laxative use in the last month but had not yet engaged in those behaviors long enough to meet the diagnostic criteria for a clinical level BN. Although participants were not yet diagnosed, if continued, their symptoms would likely lead to a clinical eating disorder. This study shows that subclinical levels of dieting can be very harmful on emotional and physical well being and may indeed lead to clinical level eating disorders (Franko & Omiro, 1999). More attention is warranted on this topic due to the harmful nature of subclinical level symptoms and their tendency to develop into clinical level symptoms.

When looking strictly at clinical symptoms the prevalence rates at first appear low with AN representing 0.15% of young females ages 12 to 22 (Hoek & van Hoeken, 2003). When partial symptoms are included, meaning those that have some clinical symptoms but do not meet the full criteria for AN, the prevalence rates increase to 0.9% (Hoek & van Hoeken, 2003).The differences between clinical and subclinical levels symptoms of BN show even greater variability. For young females ages 12 to 24, clinical level BN appears to impact 1% of this population, while subclinical levels of BN have prevalence rates as high as 5.4% (Hoek & van Hoeken, 2003; Whitehouse, Cooper, Vize, Hill, & Vogel, 1992). Other research found that approximately 15% of adolescent girls in a sample exhibited subclinical levels of BN, meaning they engaged in occasional bingeing and compensatory behaviors but not yet enough to constitute a clinical diagnosis (Stice & Killen, 1998). Clearly, the concept of gender cannot be ignored when studying eating disorders, as females are particularly vulnerable to developing disordered eating symptoms due to increased pressure to be thin, exposure to media, and internalization of the thin ideal. Sociocultural pressures to be thin and internalization of the thin ideal, especially during adolescence, encourages and helps to maintain body dissatisfaction in girls (Bordo, 1993). Adolescence is also a time when the female body begins to change

dramatically due to puberty, which involves an increase in weight and height, in turn making it almost impossible to meet societal standards for thinness. It is important that researchers acknowledge the tendency for eating disorder symptoms, including both clinical and subclinical symptoms, to surface in adolescence, particularly for females.

However, male adolescents are not immune from societal pressures regarding ideal body size. Although girls may receive more pressure to be thin, both boys and girls are influenced by internalization of cultural ideals. Body shape has been found to be central to definitions of attractiveness for both males and females in the United States (Epel, Spanakos, Kasl-Goodley & Brownell, 1996). Due to gender role stereotypes, it has been thought that the drive for muscularity may impact adolescent boys in a similar way to internalization of the thin ideal for females (McCreary, Sasse, Saucier & Dorsch, 2004; McCreary & Sasse, 2000). For example, research has shown that males who have a higher drive for muscularity are less satisfied with their bodies and therefore weight train and diet more frequently (McCreary & Sasse, 2000) However, the pressures and consequences of body image for boys are not nearly as pervasive and harmful as they are for girls, as Western culture objectifies and oppresses women and privileges male power (Bordo, 1993). While men experience pressure, they ultimately still hold privilege within society while this pressure for girls can lead to further oppression and negative consequences including disordered eating.

Researchers have proposed that disordered eating can be placed on a spectrum with subclinical level symptoms on one end and clinical level symptoms on the other (Franko & Omiro, 1999). The two levels of symptoms therefore do not represent separate disorders but rather degree of severity. This continuity hypothesis describes AN and BN as the end point on a continuum of disordered eating. This would mean that those with subclinical disordered eating

have the same type of symptoms as those with clinical AN and BN, but these symptoms are quantitatively different in terms of severity (Franko & Omiro, 1999). Subclinical disordered eating may include binge eating and vomiting, laxative use, intensive dieting and intensive exercising. Although these are the same behaviors that are present in individuals with clinical AN and BN, they are less severe in individuals with subclinical disordered eating. Less severe implies that individuals with subclinical symptoms may engage in these behaviors less often, and they may also exhibit only one or two eating disordered behaviors. Several psychological symptoms appear to be present in individuals with subclinical level eating disorders as well, including a drive for thinness, body dissatisfaction, depression and perfectionism (Franko & Omiro, 1999). These psychological symptoms are identical to those present in clinical level eating disorders, and there is little difference in severity of psychological symptoms between the two groups.

One of the main distinctions between clinical eating disorders and subclinical levels of disordered eating are the frequency of symptoms. For a clinical diagnosis of BN, inappropriate compensatory behaviors such as binging, purging, laxative use and over-exercising must occur at least twice a week for 3 months (APA, 2000). For example, when using a grouping strategy researchers found that those with clinical BN engaged in purging 3-4 times a week for at least 3 months while those with subclinical levels of BN purged once a week over a 3 month period (Stice & Killen, 1998). While the DSM-IV-TR does not stipulate a time frame, a diagnosis of AN implies a long duration of symptoms because the severity of starvation leads to significant weight loss and amenorrhea (Andreasan & Black, 2006; APA, 2000). However, with regard to subclinical disordered eating, individuals may go several weeks without symptoms and then have a recurrence of disordered eating which precludes them from a clinical diagnosis. While those

with AN and BN show a consistent pattern of symptoms over a specific period of months, those with subclinical levels of disordered eating appear to have symptoms that are more sporadic (Bunnel et al., 1989).

Interestingly, while eating behaviors like purging and exercising may be quantitatively different in clinical versus subclinical patients, there is evidence that psychological symptoms may not show as much variance (Bunnel et al., 1989). In one study, for example, individuals with subclinical anorexic symptoms and those with AN had comparable levels of psychological distress relating to body image dissatisfaction and depression, but those with AN had restrictive eating behaviors that were more severe and greater in frequency (Bunnel et al., 1989). Researchers have thus argued that psychological features of eating disorders may be core and central to the disorder, and not simply a manifestation that happens with clinical level symptoms (Bunnel et al., 1989). Therefore, while subclinical disordered eating includes physical symptoms that are less frequent and severe, individuals are likely to experience psychological symptoms that are just as severe as those with AN and BN. Therefore, it is important that researchers and clinicians do not disregard subclinical symptoms or consider them less important than clinical level eating disorders.

Due to the fact that clinical eating disorders and subclinical levels of disordered eating may represent variations of the same condition, the precursors to both may be similar. For instance, the dual-pathway model of eating disorders proposes that restrained eating and negative affect are the two main predictors of bulimic behavior (Stice, Ziemba, Margolis & Flick, 1996). Other symptoms such as perceived pressure to be thin, body dissatisfaction and body mass are also important predictors, in that they contribute to dietary restraint and negative affect. In a study examining the dual-pathway model, both those with BN and those with subclinical levels

of symptoms did not differ on levels of pressure to be thin, body dissatisfaction, hostility, and anxiety (Stice et al., 1996). However, those with subclinical levels of BN had lower levels of retrained eating and negative affect than those with clinical BN. These results support the continuity hypothesis of eating disorders since the two groups differed quantitatively in the severity of their eating behaviors but not with regard to their psychological attributes.

Clearly, subclinical levels of disordered eating warrant more attention because they are closely linked with clinical symptoms, even sharing some of the same precursors. One such precursor that deserves consideration and will be the focus of the remainder of the paper is the adolescent sibling relationship.

Siblings

While there is a wealth of data examining the potential causes and treatment of eating disorders and various ways to define this problem, very little of the data focuses on the role of family members in either facilitating or preventing disordered eating. To date, the majority of research that does exist focuses on parenting, specifically the way mothers may influence daughters. From a feminist perspective this can be explained through the pressure and scrutiny placed on mothers, which often results in "mother-blaming." Sibling relationships have been a neglected area within eating disorder research. The following sections will explore the defining features of adolescent sibling relationships and why such relationships may play a role in healthy or unhealthy development.

General relationship qualities. Over 80% of individuals in western cultures have at least one sibling, and these sibling relationships are unique for many reasons (Noller, 2005). Biological sibling relationships usually begin at a very young age and can go on to be one of the longest relationships in life. For this reason, siblings are often considered attachment figures

because they provide security, emotional support, and are often in close proximity to each other (Noller, 2005). The level of warmth, amount of self disclosure and amount of emotional understanding all relate to the quality of the sibling relationship. For the purposes of this paper, these relationship variables will be surmised and referred to as nurturance. Self disclosure is an important part of a nurturing relationship as it allows sibling dyads to develop trust as well as creates opportunities for support and guidance (Howe, Aquan-Assee, Bukowski, Lehoux & Rinaldi, 2001). More self disclosure and confiding in a sibling are related to higher levels of warmth and intimacy in the sibling relationship while lower rates of sharing information with a sibling is related to a lack of trust and emotional support within the relationship (Buhrmester & Prager, 1995; Howe et. al., 2001). Nurturing sibling relationships help foster open communication and the ability to discuss important issues. Research also suggests that siblings who perceive their relationship to be warm and supportive demonstrate greater insight into the emotional experiences of others and are better able to solve relational dilemmas (Buhrmester & Prager, 1995; Howe et. al., 2001). Warm relationships and emotional understanding are found more consistently among sister dyads, due to the emphasis on intimacy within these relationships (Buhrmester & Prager, 1995).

Nurturance within sibling relationships may be especially important as siblings transition into adolescence. Numerous studies have examined the impact that sibling relationships might have on adolescent adjustment. For example, Noller and Northfield (2000) examined the connection between adolescent anxiety, depression and self esteem and the quality of sibling relationships. These researchers found that males who experienced higher rates of depression had sibling relationships that were lower in warmth. Furthermore, among male and female adolescents, high levels of anxiety and low levels of self esteem were negatively correlated with

warm sibling relationships (Noller, 2005). Similarly, Kim and colleagues (2007) explored sibling relationships as they relate to peer adjustment, finding that positive sibling relationships were related to positive peer experiences. It is likely that siblings serve as role models, and relationships with siblings can serve as one of the first opportunities children have in learning social behavior and reinforcement. When sibling relationships are positive and nurturing, children have more opportunities to develop social skills, witness positive problem solving and can provide each other with socio-emotional support (Antonucci, 1985; Kim, McHale, Crouter, & Osgood, 2007). In contrast, prolonged conflict in relationships with siblings can teach children aggressive behaviors which may be exhibited in peer relationships (Bank, Burraston, & Snyder, 2004).

Sibling quarreling. Overall, sibling relationships can best be described as emotionally ambivalent, meaning that while they are constituted by both intense positive and negative interactions, there is usually a balance of the two (Deater-Deckard, Dunn, & Lussier, 2002). While sibling relationships can foster emotional closeness and intimacy, these relationships also endure a significant amount of conflict, with rates of conflict peaking during early adolescence (Barr & Smetana, 2010). For the purposes of this paper, the terms quarreling and conflict will be used interchangeably. Studies have found that conflict occurs more in adolescent sibling relationships than adolescents' relationships with mothers, fathers, grandparents, friends and teachers (Barr & Smetana, 2010; Furman & Buhrmester, 1985). One possible explanation for increased conflict in adolescence could be that siblings are closer in age to each other than any other family member. Additionally, the concept of kinship may play an important role in understanding conflict among siblings. Kinship often implies either a biological or emotional

closeness over a long period of time, and relationships such as these are thought to be able to withstand heavy conflict without fear that the relationship will end (Barr & Smetana, 2010).

Transition to adolescence. Age and developmental changes may play a particularly important role in the presence of conflict in sibling relationships as individuals transition into adolescence. By the time the youngest child in the sibling dyad is 12, the relationship is thought to be much more egalitarian than in childhood (Buhrmester & Furman, 1990). This has to do with the autonomy gained by the younger sibling which decreases the amount of perceived dominance he or she feels from older siblings (Buhrmester & Furman, 1990). Power and status changes happen for siblings, especially as the youngest sibling reaches adolescence and becomes more equal in development and competence (Vandell, Minnett, & Santrock, 1987). Power changes and shifts in the structure of relationships may contribute to conflict in adolescence as siblings negotiate changes in dominance and nurturance. Younger siblings now need more independence and less nurturance, and this may be difficult for older siblings to adapt to as they are not used to their younger sibling being "self sufficient" (Buhrmester & Furman, 1990; Vandell et al., 1987,).

Sibling constellations. The constellation of sibling relationships and the gender of certain dyads may impact how siblings experience relationships. Siblings that are closer in age and have less "space" between them seem to experience relationships with more fighting and dominance (Buhrmester & Furman, 1990). Increased warmth and closeness in relationships tend to be more common among siblings that are farther apart in age due to the decreased amount of conflict. Less conflict and dominance leads to more opportunities for positive interactions and prosocial behaviors within the sibling relationship (Buhrmester & Fuhrman, 1990). Also, same-sex sibling pairs tend to experience closer relationships than brother-sister dyads (Buhrmester & Fuhrman,

1990; Kim, McHale, Crouter & Osgood, 2006). When comparing sister dyads to brother dyads, sisters experience more intimacy in their relationships and this intimacy tends to stay more stable over time (Buhrmester & Fuhrman; 1990, Kim et. al., 2006). This gendered pattern can be explained by the relational nature of females and the emphasis they tend to place on maintaining connections with others, likely due to societal expectations for women to do the emotional work within families (Kim et. al., 2006). For example, as siblings age into adulthood, sister-dyads are more likely to maintain contact than brother dyads or brother-sister dyads (Noller, 2002). Furthermore, opposite-sex dyads seem to have more conflicted relationships than same-sex dyads (Buhrmester & Fuhrman, 1990; Deater-Deckard et al., 2002). It is likely that decreased amounts of intimacy which are found in opposite-sex dyads are related to increased levels of conflict between these sibling dyads. Therefore, because conflict has been associated with poorer adjustment in adolescence, being in an opposite-sex sibling relationship may pose an additional risk for poor adjustment. These findings seem to be consistent with the importance that intimacy plays in sibling relationships during adolescence (Kim et. al., 2006).

Conflict during adolescence. Regardless of gender and age differences in siblings, conflict and quarreling between siblings peaks during early adolescence and then begins to decline across middle adolescence (Kim et. al., 2006). In childhood and early adolescence, individuals may spend more time in familial settings and may interact more with their siblings. As adolescents gain autonomy and begin to establish peer and romantic relationships in middle and late adolescence, they tend to become less dependent on familial or sibling relationships. However, although frequency of interactions and dependence may decrease, sibling relationships still remain important during adolescence and across the transition from adolescence to adulthood (Buhrmester & Furman, 1990). While perceived companionship between siblings

decreases during adolescence, the level of emotional attachment remains strong and stable, often fostering egalitarian friendships (Buhrmester & Furman, 1990). With the stress that accompanies the teenage years, the ability to maintain friendships with siblings can be an important protective factor against the development of problematic behavior (Kim et. al., 2007). If these relationships continue to be positive in adolescence, there is a greater likelihood that siblings will rely on each other for support and maintain contact as they transition into adulthood (Noller, 2002). Early adolescence appears to be the time when conflict increases, and while some siblings make it through this period and become closer, many sibling relationships become more distant (Buhrmester & Furman, 1990). These sibling relationships that become more conflicted and distant have the potential to lead to problematic adjustment in adolescence.

Conflict characteristics. Research suggests that conflict in sibling relationships generally has to do with moral and personal matters (Barr & Smetana, 2010). Moral conflict concerns the well-being of others and would include teasing, while personal issues pertain to privacy and personal choices. Consistent with previous findings regarding adolescent sibling conflict, conflict over moral and personal matters peaks in early adolescence (Kim et. al., 2006; Barr & Smetana, 2010). For instance, adolescents typically tend to fight about personal issues such as borrowing each other's things, who has to do the chores, and hanging around or bothering one sibling while the other sibling has friends over (Barr & Smetana, 2010). Conflict over invasion of privacy is thought to peak during this time period due to adolescents' need to establish autonomy (Barr & Smetana, 2010). The ability to have one's own belongings and care for these things creates a sense of responsibility and control. Such responsibility in turn fosters a newfound sense of autonomy and individuality. In this way, the issue of personal space and privacy becomes a

moral issue as adolescents believe that it is their right to have control over their things (Barr & Smetana, 2010).

Intense and consistent conflict regarding personal and moral issues such as invasion of privacy has been associated with poorer relationship quality for siblings (Barr & Smetana, 2010; Kim et. al., 2006). Siblings may become resentful of one another if their space is continually being invaded which can impact the overall quality of the relationship. A desire to have their own space and to have control over what belongs to them can be hindered by the close proximity of siblings during this time period (Barr & Smetana, 2010). Even if siblings do not share a room they are generally in close proximity to one another when they are at home. This constant closeness creates a paradox for adolescents during a time when they are establishing autonomy and individuality such that they are attempting to form their own personal identity but in constant proximity to someone with their own unique personality and interests. A constant invasion of privacy as well as the conflict associated with this leads to relationship strain as well as less opportunity to establish autonomy (Barr & Smetana, 2010).

Comparison and competition. Comparison and competition between siblings may also play a large role in their understanding of the relationship and the amount of conflict experienced. Comparison of oneself against his or her siblings may be especially frequent and difficult due to the close nature of the relationship and the frequency and intensity of interactions (Noller, 2005). Due to the fact that adolescence is a time of identity formation, siblings may be comparing themselves more frequently if they look up to another sibling and wish to be like him or her. Comparing oneself to a sibling also seems to increase during adolescence, particularly for girls (Coomber & King, 2008). For example, as girls transition through adolescence they are increasingly more likely to compare their appearance and body shape against their sisters'

appearance (Coomber & King, 2008). Siblings also seek approval from one another, with younger siblings being more likely to seek approval from other siblings while older siblings place equal importance on approval from siblings and friends (Gamble & Jeong Jin, 2008). In terms of competition between siblings, Noller (2002) found higher emotional reactivity when siblings were outperformed by other siblings than when they were outperformed by friends. Sibling relationships that had increased warmth and decreased amounts of conflict seemed to relate more positively toward their sibling during times of competition and comparison (Noller, 2005). While sibling relationships can be thought of as competitive in nature due to the fact that siblings are in competition for the same resources, such as love and attention from parents, Noller contends that siblings relationships that are higher in warmth appear to be less threatened by their siblings (as cited in Dunn, 2000). High rates of comparison, approval-seeking and competition point to the value that siblings place on one another and the importance of the relationship overall.

Prolonged conflict and adjustment. Sibling conflict has been strongly linked to poorer adjustment during adolescence. For example, high levels of conflict with siblings were associated with greater externalizing behavior problems and poor peer relationships (Bank et al., 2004). Internalizing behaviors such as depression and antisocial behavior have also been linked to individuals with sibling relationships that are more conflicted and less warm (Deater-Deckard et al., 2002; Kim et. al., 2007). One explanation for these findings is the influence that sibling relationships have in developing social competence. More specifically, in sibling relationships that are continually conflicted, individuals do not learn how to appropriately solve problems, which may then contribute to maladaptive interaction styles (Kim et. al., 2007). These adolescents may, as a result, have conflicted same-sex and opposite-sex peer and partner

relationships. Further, with a lack of pro-social relationships, individuals are at greater risk for poor adjustment in other domains of life including poorer academic performance, relational problems and behavioral and emotional problems, which can affect individuals well beyond adolescence (Kim et. al., 2007).

The impact that prolonged sibling conflict and greater amounts of negative interactions can have on adolescent's social-emotional development is a finding that should not be taken lightly. For example, sibling conflict appears to be a risk factor for depression (Kim et. al., 2007; Noller, 2005). Increased rates of sibling conflict are more strongly related to an increase in depression than changes in sibling intimacy (Kim et. al., 2007). This points to the idea that while both relationship intimacy and conflict can serve as risk factors for depression, sibling conflict appears to be more detrimental (Kim et. al., 2007). Prolonged sibling conflict which is violent in nature can be a particularly potent risk factor for antisocial behaviors, which can, in turn, be a precursor to oppositional defiant disorder and conflict disorder. This has been found to be the case more often in boys than girls (Bank et al., 2004).

Sibling favoritism. Similar to sibling conflict, favoritism may impact adjustment during adolescence and lead to problematic behaviors. Sibling favoritism by parents involves preferential treatment of one sibling over the other. This favoritism may result in hostility or dysfunction between siblings and decrease the overall functioning of the sibling relationship (Brody et al., 1998). Favoritism can also have detrimental effects on the identity and emotional development of the sibling who is not favored, which likely has later repercussions on the development of prosocial relationships with peers and intimate others (Bank, 1987). In families that displayed favoritism, there was less evidence of prosocial behavior between siblings (Hetherington, 1988). The sibling who was not favored was more likely to behave in ways that

were aggressive, avoidant or unaffectionate towards the favored sibling (Brody et al., 1998). Additionally, this sibling reported an increased sense of shame and more intense fear (Brody et al., 1998). This sense of shame and fear are common within internalizing behaviors such as depression and low self-esteem, both common within eating disorder populations. Therefore, similar to what was discussed earlier regarding sibling quarreling, it is thought that sibling favoritism may have effects on personal and prosocial development. While these variables are related, researchers are unsure if strained relationships are a result of parental favoritism or vice versa. Clearly, more research on this topic is needed.

From a family systems perspective, sibling favoritism and conflict may come about when there is disruption within the larger family system. For example, favoritism has been found to be related to lower family cohesion, higher disengagement and higher family conflict. (Brody et al., 1998). As mentioned above, this disruption in family functioning may be detrimental to adolescent adjustment and result in internalizing behaviors. Sibling relationship quality, including favoritism, has been examined in relation to antisocial behavior and depression. However, there is very little research that examines the connection between sibling relationships and disordered eating. The following section will discuss the limited research that has focused on this topic.

Influence of Siblings on Disordered Eating

Siblings may influence one another in a variety of ways due to shared genetics and being reared in similar environments. This section will address three specific ways that siblings may influence development of disordered eating. First, familial factors specific to being reared in the same environment will be examined and then socio-cultural factors regarding how siblings may influence development of body image through comparison and modeling will be explored.

Finally, a discussion regarding the quality of sibling relationships in the development and treatment of disordered eating will be examined.

Family size and birth order. Historically, researchers hypothesized that patients with AN were more likely to be only children and those with BN were more likely to have more than one sibling (Kay, Schapira & Brandon, 1967; Vandereycken & Van Vreckem, 1992). However, current research has not supported these hypotheses, and studies have not demonstrated a significant relationship between eating disorders and family size (Vandereycken & Van Vreckem, 1992). This means that eating disorders can impact individuals in a variety of different familial constellations including those with only one child, very large families and anything in between. Similarly, past research has suggested that those with AN are more likely to be first or second born children, but current research has not replicated these findings nor has any consistent pattern regarding birth order and eating disorders been found (Vandereycken & Van Vreckem, 1992). However, other studies have found that for females with AN, the number of female siblings in a family is significantly higher than the general population (Becker, 1980; Vandereycken & Van Vreckem, 1992). Therefore, it is possible that having a female sibling may be related to increased levels of disordered eating patterns, and that more than one sister may even further increase these chances. This suggests that there may be something significant regarding the role of sisters which increase the chance of AN symptoms. A possible explanation may be the closer nature of sister relationships compared to brother-sister or brother-brother dyads and the influential nature that sisters have on one another. In contrast, the number of females in a family was not significant when looking at those with BN (Dolan, Evans & Lacey,1989; Vandereycken & Van Vreckem, 1992).

Personality. An argument has been made that distinct personality traits may exist in those with eating disorders, and personality differences in individuals with eating disorder and their siblings have been examined. For instance, researchers found that those with AN were less spontaneous and less impulsive than their non-affected sisters (Casper, 1990; Vandereycken & Van Vreckem, 1992). Due to the rigid nature of AN, which is characterized by strict adherence to specific ways of eating and exercising it would seem appropriate that this sample exhibited less spontaneity and less impulsivity than their non-affected sisters. Those with AN also scored lower than sisters on tests of dominance, sociability, and self acceptance (Casper, 1990). It is possible that the sibling with the eating disorder may feel controlled by another sibling and use AN as a way to try to gain power within the relationship, which may explain the lower rates of dominance in those with AN (Guilfoyle, 2009). Decreased sociability can be explained by the fact that having an eating disorder is often secretive and time consuming and tends to detract from time spent with peers. Therefore, non-affected sisters likely spend more time with friends and family members than those with AN. However, while those with AN scored the lowest on dominance, sociability and self-acceptance, sisters also scored lower on these traits than the control group comprised of non-affected sister dyads (Casper, 1990). This suggests that those with eating disorders and their sisters do not have categorically different personalities, but rather exhibit different levels of the same personality traits (Casper, 1990). Personality traits can be thought of as a continuum with those with eating disorders on one end, the control group on the other end and sisters in the middle. Since those with eating disorders and their non-affected sisters are more likely than control groups to exhibit certain personality traits, there may be something unique about these families which decreases dominance, sociability and self-acceptance.

Eating disorders among family members. When researching the prevalence of eating disorders in more than one member of the family, studies are scarce. A study done several decades ago sampled 70 patients with AN and found that none of the patients' siblings reported symptoms of an eating disorder at any point in their lives (Cremieux & Dongier, 1956). Other, more recent studies have shown similar results; however, if a sibling does have an eating disorder he or she is more likely to be a sister than a brother (Vandereycken & Van Vreckem, 1992). Interestingly, sisters of those with eating disorders have a higher level of body dissatisfaction and drive for thinness than sisters of those without eating disorders (Vandereycken & Van Vreckem, 1992). This suggests that the presence of an eating disorder in one sibling may increase body dissatisfaction in the other sibling. While sisters of those with eating disorders may not end up with full blown clinical-level symptoms, they are at an increased risk for body dissatisfaction (Vandereycken & Van Vreckem, 1992). Since both siblings are experiencing body dissatisfaction and live in the same home, this finding may also suggest something about the familial environment in which parents or other family members may encourage dieting and thinness. One of the most extensive studies done regarding this topic found that female first degree relatives of those with AN are the most susceptible to developing eating disorders than any other sub-group of relatives (Strober, Lampert, Morrell, Burroughs, & Jacobs, 1990). This findings suggests both a biological and environmental explanation since first degree relatives are likely to be blood-related and are also more likely to be reared in the same or similar environment as the family member with AN.

Sociocultural pressures and body image. Sociocultural pressures to be thin are often used to describe aspects of the social environment that reinforce messages regarding thinness and beauty, especially for girls. These include but are not limited to, media, family members and peer

groups, which reinforce societal messages regarding body shape and size (Coomber & King, 2001; Tsiantas & King, 2001). Internalization of the thin ideal is especially salient in Western industrialized countries like the United States where there is easy access to the media and consistent socio-cultural pressure from friends and family members regarding appearance (Tsiantas & King, 2001). This pressure is experienced more often by girls than boys, though it has been found in both. When examining sociocultural pressures in siblings, it was found that younger and older siblings were both impacted by internalization of the thin ideal and closest-in-age sisters had similar levels of body dissatisfaction (Tsiantas & King, 2001). For younger and older siblings, body dissatisfaction and body shape concerns increased as sociocultural pressures regarding appearance increased (Tsiantas & King, 2001). One explanation for these findings is the shared environmental experiences of being female in a familial and sociocultural setting that reinforces the thin ideal (Coomber & King, 2001; de Leeuw, Snoek, can Leeuwe, van Strien & Engels, 2007; Tsiantas & King, 2001). Current societal standards can perpetuate disordered eating by objectifying girls and placing undue emphasis on the size and shape of female bodies (Bordo, 1993). Such societal standards may be further reinforced within families or sibling dyads that emphasize the importance of appearance and weight.

In general, younger siblings appear to have greater overall levels of body size distortion, body dissatisfaction, and body shape concerns (Tsiantas & King, 2001). This may be related to the fact that sibling social comparison is higher in younger siblings because they look up to older siblings and are more likely to evaluate their appearance by comparing it to an older sibling (Tsiantas & King, 2001). Younger siblings may be more influenced by older siblings while older siblings are more influenced by peers. Therefore, younger siblings might be more susceptible to

body image dissatisfaction within the sibling relationship than older siblings (Tsiantas & King, 2001).

Social comparison. The social comparison theory suggests that there is an innate drive for humans to compare themselves to others on psychologically important attributes (Rieves & Cash, 1996). How people "measure up" on these attributes compared to others then influences evaluation of self worth. Due to the emphasis on thinness and appearance in Western cultures, it has been suggested that comparison of appearance is a significant way to measure self worth (Rieves & Cash, 1996). Comparison and body image dissatisfaction appear to be closely related in that regular comparison of oneself to another person increases the risk of body image dissatisfaction (Heinberg & Thompson, 1992; Tsiantas & King, 2001). Due to the amount of time spent together and the close proximity to one another, siblings represent an outlet for constant comparison and can influence body image dissatisfaction (Honey et al., 2006; Rieves & Cash, 1996). Because higher levels of appearance-based comparisons tend to increase body image dissatisfaction, this places siblings at an increased risk for body image dissatisfaction (Tsiantas & King, 2001). Sisters and female peers appear to be particularly influential targets of social comparison (Coomber & King, 2008; Tsiantas & King, 2001). For older siblings during adolescence, as appearance comparisons against younger siblings became more frequent a preference for thinness increased (Tsiantas & King, 2001). Recent research has found that during adolescence, females compare their physical appearance to peers more so than sisters; however, as these individuals transition to young adulthood there is a greater tendency to compare their physical appearance to sisters (Coomber & King, 2008). In a society where females continue to experience oppression in comparison to males, it is possible that females look to one another as role models. On the one hand, females may view each other as allies within a patriarchal culture

(Campell, Muncer & Bibel, 1998). On the other hand, because women are trying to gain power in society, females may see one another as sources of competition, which may lead to increased appearance comparisons. (Campell, Muncer & Bibel, 1998).

Modeling of disordered eating. Due to the impact of societal pressure regarding the thin ideal among girls, modeling of disordered eating is likely to occur among sisters. For example, sisters appear to contribute significantly to the development of bulimic behavior and dietary restriction through modeling (Coomber & King, 2008). The sibling relationship is one of the first places that adolescents may be exposed to dieting behaviors, and thus individuals pick up on cues from sisters regarding how to relate to their body. Due to the fact that body dissatisfaction is so prevalent among females, it would not be uncommon for one sister to view her body negatively and exhibit dieting behaviors; this may increase body dissatisfaction and dieting behaviors in the other sister. One study examined three patterns of maladaptive eating and the connection between eating patterns among sisters (de Leeuw et al., 2007). These behaviors were broken up into emotional, external and restrictive eating. Emotional eating refers to eating in response to stress anxiety or fear, while external eating involves the consumption of food in response to the sight, smell or availability of food and restrained eating involves the self imposed resistance to food. Surprisingly, younger siblings appeared to influence older siblings in the domains of emotional and external eating (de Leeuw et al., 2007). Researchers expected that younger siblings would be more influenced due to the older sibling serving as a role model, though this did not appear to be the case (de Leeuw et al., 2007). A possible explanation may be that older siblings are more likely to have undergone puberty, which generally results in weight gain. Social comparison and internalization of the thin ideal may cause the older sibling to

compare herself to the younger sibling and imitate her eating behavior because that sibling had not yet undergone puberty (de Leeuw et al., 2007).

Appearance-related teasing. Another construct that appears to be strongly related to body dissatisfaction and eating disturbances is appearance-related teasing. Appearance-related teasing is extremely common during childhood and adolescence. The majority of adolescent girls in one study were teased by peers, friends and brothers and this teasing was generally directed at facial features or weight, which imply a focus on beauty and thinness (Rieves & Cash, 1996). .Emerging research has examined the specific role that family members play in appearance-related teasing and the impact this has on the development of eating disorders in adolescence. Appearance-related teasing by family members has been significantly correlated with body dissatisfaction and eating disturbances for adolescent females (Neumark-Sztainer, Falkner, Story, Perry, & Hannan, 2002). In a study of 372 female adolescents in middle school, it was found that one-third were teased about their appearance by at least one sibling (Keery, Boutelle, Berg, & Thompson, 2005). These results are especially noteworthy because when comparing between siblings, fathers and mothers, participants reported the most teasing from siblings. Teasing by any sibling appeared to increase body dissatisfaction, but the highest negative outcomes were associated with teasing by older brothers (Keery et al., 2005). Such negative outcomes on behalf of the sisters who were teased included higher rates of depression, poor body dissatisfaction, lower self esteem and higher likelihood of restricting food intake. This supports the notion that male perceptions reinforce cultural ideas regarding thinness and are particularly influential in development of female body image and disordered eating.

Sibling rivalry. Sibling rivalry and sibling jealousy have often been hypothesized as a potential cause of eating disorders. In their review, Vandereycken and Van Vreckem (1992)

found that rivalrous and ambivalent relationships are likely to occur between those with eating disorders and the sibling that is closest in age to them. Whether that sibling is a brother, sister, older or younger did not appear to matter. A possible explanation is that siblings that are closer in age may have stronger relationships due to similarity in developmental stage and increased amount of time spent together. Thus, when one sibling develops an eating disorder, it might be especially distressing to the sibling that he or she is closest to and create a strain on this particular relationship. Sibling rivalry has also been found to occur more frequently in sister dyads in which one sister is struggling with either AN or BN (Vandereycken & Van Vreckem, 1992). As sister relationships may be closer in nature than other sibling relationships this might perpetuate and sustain rivalry within the dyad. Also, it has been found that sibling jealousy may be related to less favorable outcomes for those with eating disorders, such as a longer course of the disorder, more time spent in treatment and a higher likelihood of relapse of symptoms after an initial recovery (Dally, 1970; Vandereycken & Van Vreckem, 1992).

Quality of sibling relationships. Quality of sibling relationships may influence modeling and dieting behaviors. Siblings who have high quality relationships, meaning one characterized by high levels of warmth, empathy and affection, tend to have eating behaviors that are more similar (de Leeuw et al., 2007). This is especially true in the case of emotional eating. Siblings that communicate more openly and experience higher levels of warmth tended to be more similar in their levels of emotional eating (de Leeuw et al., 2007). A possible explanation of this could be similarities among siblings in that siblings with higher quality relationships may have more in common and experience shared interests. As one sibling begins to develop an interest in dieting, he or she may influence the other sibling if they have a close relationship and communicate openly (de Leeuw et al., 2007). However, it is also possible that a high quality

sibling relationship could serve as a protective factor if one sibling has high body satisfaction and does not exhibit disordered eating patterns.

Quality of sibling relationships can be particularly important during the treatment phase of eating disorders. In sister dyads in which one sister was receiving clinical treatment for an eating disorder, the sibling relationship had both a positive and negative impact (Honey, Clarke, Halse, Kohn, & Madden, 2006). The relationship can serve as a mechanism for support during treatment, but it can also lead to added stress if the non-affected sibling exhibits frustration, resentment and a lack of understanding regarding the condition (Honey et al., 2006). In one study, individuals with AN who were receiving inpatient care perceived themselves as significantly less autonomous than their sisters and viewed the family as significantly more cohesive (Karwautz et al., 2003). The lack of perceived autonomy can be explained by their current status in an inpatient setting, and the sense of familial cohesiveness could be due to the support they received from family members during treatment (Karwautz et al., 2003). The level of emotional connection and support from siblings and family members during treatment may be related to the quality of the relationship. For example, in sibling relationships that exhibit high levels of warmth and responsiveness, individuals can utilize those factors during treatment and help the individual with the eating disorder sustain recovery. On the other hand, relationships that are distant and lack understanding of the condition may create added strain during an especially stressful time.

To date, there is little research that examines the impact that familial support may play in adolescents' recovery from disordered eating during family therapy. Furthermore, although siblings may be included in family therapy, no known studies have focused specifically on the role of the sibling relationship in family therapy. However, limited research exists that is mainly

qualitative in nature but does not examine the role that relationship quality may play in perpetuating or recovering from an eating disorder. For instance, in one study, the authors discuss siblings' experiences in caring for a sibling with an eating disorder but do not examine the experience of both siblings or the influence of the relationship on disordered eating behaviors specifically in family therapy (Karwautz et al., 2003). Examining sibling relationships may have important clinical implications for family therapists who work with families impacted by eating disorders. It is clear that sibling relationships can impact the development of disordered eating behavior, as well as the treatment and recovery process (de Leeuw et al., 2007; Honey et al., 2006; Karwautz et al., 2003). However, more research is needed to examine specific qualities of sibling relationships and how these relationships serve as either risk of protective factors in the development of disordered eating

Based on the current literature, it appears that sibling conflict, nurturance and favoritism on behalf of parents may be related to adjustment outcomes during adolescence. The connection between both sibling conflict and favoritism during adolescence and poorer outcomes in adjustment provides a rationale for examining these two variables in connection with disordered eating. Intense and consistent conflict has been associated with poorer relationship quality for siblings (Barr & Smetana, 2010; Kim et. al., 2006). In the present study, conflict is examined using the variable of quarreling. Additionally, siblings who perceived their relationship as more warm and supportive demonstrated better prosocial development and greater relational skills (Buhrmester & Prager, 1995; Howe et. al., 2001). This provides a rationale for examining the connection between warmth in sibling relationships and adjustment outcomes such as disordered eating. Warmth and responsiveness in the present study is examined through the variables of sibling nurturance.

PROPOSED HYPOTHESES

As discussed, siblings appear to influence each other in a variety of ways. However, little attention has been given to the specific influences that sibling relationships may play in the development of disordered eating, a problem that tends to develop during adolescence. Therefore, the present study sought to examine the connections between sibling relationships, both positive and negative, and disordered eating. Subclinical levels of disordered eating that include body dissatisfaction and negative eating attitudes were considered. In regards to sibling relationship quality the variables of quarreling, nurturance and favoritism were examined.

First, it was hypothesized that sibling relationships that were more conflicted and experienced higher levels of quarreling might serve as a risk factors for disordered eating. Second, it was hypothesized that sibling relationships that were lower in levels of nurturance might increase the chances of disordered eating. Third, it was hypothesized that sibling favoritism by parents of one sibling may serve as a risk factor for disordered eating in the other sibling. Depending on the outcome of our initial analyses, we planned to examine mediation models to attempt to better explain the relationship between variables. For example, if better relationship quality led to more disordered eating, we anticipated that modeling behaviors between siblings or feedback by siblings regarding appearance would explain this pattern. On the other hand, if better relationship quality led to less disordered eating, then this relationship could likely be explained by lower levels of quarreling.

Finally, the variables of gender and age were examined. It was hypothesized that sister-sister dyads would display more eating disorder behaviors than opposite-sex dyads and brother-brother dyads. It was also hypothesized that within all sibling dyads, younger siblings would display more eating disorder behaviors than older siblings.

METHOD

Participants

The data used in the present study came from a larger study investigating sociocultural influences on adolescents' eating patterns and body image (see Blodgett Salafia & Lemer, 2012 for more information about the larger study). Over the time span of two years, 207 adolescents were recruited to participate in the current study Participants were either in middle school (N = 161) or high school (N = 46) and ranged in age from 12 to 19 (M = 14.40, SD = 1.52). This sample consisted of 120 girls (58%) and 87 boys (42%). The middle school as a whole had roughly 800 students in grades 7-9 while the high school had roughly 1300 students from grades 10-12, indicating a response rate of approximately 20% for the middle school and 3% for the high school. The differences in response rate may be due to student access to the study. The entire middle school had the opportunity to participate while only one teacher's classes from the high school were recruited. Within these specific high school classes, there was 100% participation. According to city statistics during the years in which the study took place, 30% of the student population in middle school received free and reduced lunch, and 15% received some form of special education services. In terms of gender composition, the middle school had approximately equal numbers of females (49.5%) and males (50.5%). Information regarding special education services and gender composition was not available for the high school.

Consistent with the ethnic composition of the city, most of the sample identified themselves as White (92%). Based on participants' self reports, the average Body Mass Index (BMI) was calculated to be 21.5 for girls and 22.4 for boys (both in the normal range). See Table 1 for a summary of demographic information on the participants. See Table 2 for a summary of the frequencies of girls and boys who had siblings.

Table 1

Participant Demographics

Characteristic	Frequency	Percent
Grade		
7	41	19.8
8	71	34.3
9	48	23.2
10	16	7.7
11	15	7.2
12	16	7.7
Ethnicity		
Hispanic	3	1.4
Native American	9	4.3
White	190	91.8
Other	4	1.9
Gender		
Female	120	58
Male	87	42
Total	207	100

Procedure

Students from a middle school and high school in a Midwestern city were recruited through flyers and parental consent forms distributed at the school. Participants under the age of 18 who returned parental consent forms were then invited to complete assent forms and a packet of surveys. Individuals aged 18 or older did not complete parental consent forms but filled out assent forms and surveys. Adolescents completed these surveys before or after school and this process took 1-2 hours. In compensation for their participation, participants received a $25 gift card to a local mall.

Table 2

Sibling Constellations

	Female Participants (N=120)	Male Participants (N=87)
1 or more sisters	58%	76%
1 or more brothers	76%	76%
At least 1 older sister	32%	42%
At least 1 younger sister	46%	42%
At least 1 older brother	39%	44%
At least 1 younger brother	46%	55%

Measures

Disordered eating. Disordered eating was measured using the children's version of the Eating Attitudes Test (ChEAT) (Maloney, McGuire & Daniel, 1988). This measure was designed to assess eating attitudes and behaviors of individuals under the age of 15. It is considered a simplified version of the Eating Attitudes Test (Garfinkel & Garner, 1982) and thought to be particularly useful in identifying girls at risk for eating disorders (Smolak & Levine, 1994). The ChEAT is a 26 item questionnaire in which participants' were asked to circle a number regarding how often they engage in certain behaviors on a 6-point scale from 0 (never) to 5 (always). Sample items include, "Do you stay away from food when you are hungry?", "Do you think about having fat on your body?" and "Do you think about wanting to be thinner?" See Appendix A.

ChEAT scores were moderately correlated with self report measures for weight management and body dissatisfaction, representing adequate concurrent validity in previous work (Smolak & Levine, 1994). The ChEAT has also been shown to have adequate test-retest reliability and internal reliability when given to a sample of third through sixth graders (Smolak & Levine, 1994). Cronbach's alphas for this sample were reported to be .76 with a test-retest reliability of .81 (Smolak & Levine, 1994). In a second study examining third through eighth graders, the internal consistency of the scale was adequate but appeared to be more reliable with those in higher grades, indicating that some of the language used on the scale may be difficult to interpret at younger ages (Maloney, McGuire & Daniels, 1988; Smolak & Levine, 1994). Cronbach's alpha for the ChEAT was .87 in the present study.

Sibling relationship quality. In the present study, sibling relationship quality was examined through the use of the Sibling Relationship Questionnaire (SRQ) (Buhrmester & Furman, 1990). Participants are asked to focus on one particular sibling when answering items. The SRQ consists of 16 scales containing items that represent various domains of relationship quality including: nurturance, dominance, affection, companionship, antagonism, similarity, intimacy, competition, quarreling, admiration and maternal or paternal partiality. See Appendix B for the complete scale.

In previous studies measuring sibling relationship quality, the SRQ has been shown to have internal consistency reliability coefficients that exceeded .60 (Brody & Stoneman, 1992; Buhrmester & Furman, 1990; Furman & Buhrmester, 1985). The SRQ has also been shown to have high test re-test reliability with a ten day test-retest reliability of .71 (Brody & Stoneman, 1992; Furman & Buhrmester, 1985). Recently, the SRQ has also been shown to have adequate construct validity in comparison to a similar measure, the Family Environment Scale (Moser &

Jacob, 2002). Convergent validity has been demonstrated in that the warmth subscale of the SRQ was significantly related to the affect and activity subscale of the Family Environment Scale(Moser & Jacob, 2002). Cronbach's alpha for the entire SRQ was .93 in the present study.

Quarreling. In the present study, sibling conflict was measured using the subscale of quarreling from the SRQ (Buhrmester & Furman, 1990). This subscale was designed to assess the amount of conflict experienced within the sibling relationship. The subscale included three questions regarding disagreements, arguments and getting mad at a sibling. A sample question from the quarreling subscale was "How much do you and this sibling get mad at and get in arguments with each other." Items were scored on a 5 point scale from 0 (hardly at all) to 4 (extremely much) and were reverse-scored such that lower scores indicated more frequent quarreling. Cronbach's alpha for the quarreling subscale was .86 in the present study.

Nurturance. Sibling relationship quality was measured through the nurturance subscale of the SRQ (Buhrmester & Furman, 1990). This subscale was designed to examine the amount of care that is given and received within the sibling dyad. The nurturance subscale consists of six questions, half of which ask about nurturance of a sibling (e.g., "How much do you show this sibling how to do things he doesn't know how to do?") and half about nurturance by a sibling (e.g. "How much does this sibling show you how to do things you don't know how to do?"). Other questions ask about teaching siblings how to do things and helping one another ("How much do you help this sibling with things he or she can't do by himself or herself?"). Items were scored on a 5 point scale from 0 (hardly at all) to 4 (extremely much), with higher scores indicating greater sibling nurturance. Cronbach's alpha for the nurturance subscale was .84 in the present study.

Favoritism. The SRQ was also used to measure sibling favoritism, but a slightly different rating scale was used. Items were assessed on a 6 point scale from 0 (my sibling almost always gets treated better) and 5 (I almost always get treated better). In total the subscale included six questions, three inquiring about partial treatment by mothers and three for partial treatment by fathers. The subscale included three questions regarding attention, favoritism and treatment (e.g., "Who usually gets treated better by your mother, you or your sibling"; "Who gets more attention from your father, you or this sibling?"). Lower scores indicated favoritism and better treatment of the sibling. Cronbach's alpha for the favoritism subscale was .75 in the present study.

Sibling modeling. Modeling of eating disordered behavior among siblings was measured using the Bulimic Modeling Scale created by Stice (1998). Such disordered eating behaviors included binge eating episodes, vomiting, dieting or exercising excessively to control weight. Items also inquired about the amount of preoccupation and body dissatisfaction experienced (e.g., "One or more of my friends felt bad about themselves because of their weight"). The original scale included 15 questions regarding how often an individual has seen family members, friends or people in the media engage in these behaviors. The present study adapted the original scale to include sibling items. Only five adapted sibling items were used in the present study. Items were scored on a 5 point scale indicating frequency of behaviors with 0 (never) to 4 (often). Sample items included, "My siblings have vomited to lose weight" and "My siblings have felt bad about themselves because of their weight". See Appendix C.

Because the original scale was adapted, reliability and validity data do not exist for the sibling items. However, the subscales of family, peer and media modeling have all been shown to have internal consistency above .78 (Stice, 1998). The subscales of the Bulimic Modeling Scale have also been found have high test-re-test reliability within a two week period (Stice,

1998). Both family and peer modeling subscales averaged above .77 for test-retest reliability, and the media modeling subscale was slightly lower at .51 (Stice, 1998). Construct validity has been demonstrated for the bulimic modeling scale such that the three subscales of the bulimic modeling scale were negatively correlated with the body esteem scale (Stice, 1998). In the present study, Cronbach's alpha for the bulimic modeling subscale for siblings was .66.

Sibling appearance related feedback. Appearance related feedback by siblings regarding weight and shape was measured using the Perceived Sociocultural Influences on Body Image and Body Change Questionnaire (McCabe & Ricciardelli, 2001). The scale was designed to measure perceived feedback, encouragement, and teasing from family and peers regarding appearance, weight, and muscles tone (e.g., "Does your father tease you about gaining weight"). The original scale included questions that asked about feedback provided by mothers, fathers, closest male friend, and closest female friend. An additional set of questions inquiring about siblings was adapted for use in the current study. Three of these questions dealt specifically with appearance related feedback. Participants were asked about the feedback they received from siblings regarding their body shape and size, eating patterns, and level of exercise. Items were assessed on a 5 point scale from 0 (extremely negative) to 4 (extremely positive). A sample question includes, "What type of feedback do you receive from your siblings about your level of exercise to change your body size and shape?" See Appendix D for these items. Because the original scale was adapted, reliability and validity data do not exist for the sibling items. All other versions of this scale (e.g., for mothers, fathers, male peers, and female peers) have been shown to have a reliability score of .72 (McCabe & Riccardelli, 2001). Additionally, a confirmatory factor analysis found the perceived media influences scale to be a reliable measure

for both boys and girls (McCabe & Riccardelli, 2001). Cronbach's alpha for the three sibling items used in the present study was found to be .92.

Table 3

Description of Measures

Dependent Variable	Variable name	Measurement Properties
Disordered eating		ChEAT – 26 item questionnaire, 6 point scale
Independent Variables		
Sibling relationship quality	Quarreling	6 item subscale of SRQ 5 point scale
	Nurturance	6 item subscale of SRQ 5 point scale
	Favoritism	6 item subscale of SRQ (3 for mothers, 3 for fathers) 5 point scale
Sibling modeling		5 items adapted for siblings from original Bulimic modeling scale (Stice 1998) 5 point scale
Appearance related feedback		16 items adapted for siblings from Sociocultural Influences on Body Image and Body Change Questionnaire (McCabe & Ricciardelli, 2001).

RESULTS

Analysis Plan

Hypotheses for the present study were tested using linear regressions, mediational analyses and analysis of variance (ANOVAs). The first hypothesis was tested using linear regressions to examine whether sibling relationships with higher levels of quarreling were associated with increased levels of disordered eating. The second hypothesis used linear regressions to determine whether sibling dyads with lower levels of nurturance were associated with higher levels of disordered eating. The third hypothesis also used linear regressions to determine whether higher levels of sibling favoritism by parents were associated with higher levels of disordered eating within the sibling dyad. Depending on the outcome of these linear regressions, mediational analyses were conducted in order to determine if modeling of sibling behaviors or appearance related feedback would mediate the connection between relationship quality and disordered eating. Finally, the fourth hypothesis used ANOVAs to determine if sister-sister dyads displayed more eating disordered behaviors than opposite-sex dyads and brother-brother dyads. ANOVAs were also be used to examine if younger siblings displayed more eating disordered behaviors than older siblings. For all analyses in the present study, SPSS 19.0 was used, and the alpha level was set at .05 to determine if the relationships were significant.

Model Testing

Regressions. Three linear regression analyses were conducted to determine the effects of siblings on adolescents disordered eating. Boys and girls were tested separately, resulting in six total regressions. First, a linear regression was conducted to evaluate the prediction of disordered eating from the overall measure of sibling nurturance. Results indicated no significant

relationship between sibling nurturance and disordered eating in girls (β= -.14, p=.14) and boys (β= -.05, p=.70). Second, a linear regression was conducted to evaluate the prediction of disordered eating from the overall measure of sibling quarreling. There was no significant relationship between sibling quarreling and disordered eating in girls (β= -.09, p=.36) and boys (β= -.07, p=.52). Finally, a linear regression was conducted to evaluate the prediction of disordered eating from the overall measure of sibling favoritism. The relationship between sibling favoritism and disordered eating was not significant for boys (β= -.12, p=.29). For girls, in contrast, the two variables were linearly related such that less favoritism of the adolescent (and more for the sibling) was associated with more adolescent disordered eating ($\beta = -.22$, $p < .05$). The regression equation for predicting disordered eating for girls was:

$$\textit{Predicted Disordered Eating} = -1.1\ \textit{sibling favoritism} + 42.7$$

The 95% confidence interval for the slope, -1.95 to -.14 does not contain the value of zero, and therefore sibling favoritism is significantly related to disordered eating. Approximately 4% of the variance of the disordered eating was accounted for by sibling favoritism.

Mediation. Because this relationship was significant, we went on to conduct a linear regression between the mediator and predictor variable for girls. A linear regression analysis was conducted to evaluate the prediction of bulimic modeling from the overall strength of sibling favoritism. The two variables were not linearly related ($\beta = .14$, $p > .05$). The regression equation for predicting modeling of the disordered eating behavior was:

$$\textit{Predicted Bulimic Modeling} = .09\ \textit{Sibling Favoritism} + .07$$

The 95% confidence interval for the slope, -.04 to .22 does contain the value of zero, and therefore sibling favoritism is not significantly related to bulimic modeling. There was not a significant relationship between the mediator variable of bulimic modeling and the predictor

variable of sibling favoritism. Thus, no mediation occurred. Because this relationship was not significant, we did not go on to conduct a linear regression between the outcome and predictor variable.

ANOVAs. A one-way analysis of variance was next conducted to evaluate the relationship between disordered eating within younger and older siblings. The independent variable, sibling type, included three levels: older siblings, younger siblings and both. The dependent variable was the level of disordered eating in all groups. The ANOVA for girls was not significant, $F(2,105)=1.06$, $p=.35$. The ANOVA for boys was also not significant, $F(2,80) =.42$, $p=.66$. Follow up tests were not conducted because the ANOVAs were not significant; however, some interpretation of mean differences can be made. Girls with younger siblings had higher rates of disordered eating ($M=32.98$) than those with older siblings ($M=31.00$), or both younger and older siblings ($M=27.04$). Boys with older siblings had higher rates of disordered eating ($M=26.33$) than those with younger siblings ($M=23.73$), or both younger and older siblings ($M=22.65$). See table 1 for descriptive statistics of all study variables.

A one-way analysis of variance was also conducted to evaluate the relationship between having a brother or sister. The independent variable, sibling type, included three levels: having a sister, having a brother, or both. The dependent variable was the level of disordered eating in all groups. The ANOVAs for girls and boys were not significant, with $F(2,107)=.20$, $p=.81$ and $F(2,80)=.55$, $p=.58$ respectively. Follow up tests were not conducted because the ANOVAs were not significant; however, some interpretation of mean differences can be made. Girls with both a sister and a brother had higher rates of disordered eating ($M=31.88$) than those with a brother ($M=29.59$), or a sister (30.68). Boys with a brother had higher rates of disordered eating ($M=27.00$) than those with a sister ($M=22.09$), or with both a brother and a sister ($M=24.14$).

Table 4

Descriptive Statistics

Variable	*M*	*SD*	Actual Range	Potential Range
Disordered Eating	27.88	15.66	3.00-79.00	0 – 130
Bulimic Modeling	1.50	2.28	.00 – 12.00	0 – 20
Appearance Feedback	4.87	2.92	.00 – 12.00	0 – 12
Sibling Favoritism	11.50	3.47	.00 – 23.00	0 – 30
Sibling Nurturance	12.77	5.23	.00 – 24.00	0 – 30
Sibling Quarreling	6.24	3.09	.00 – 12.00	0 – 15

Table 5

Correlations Among Study Variables for Girls and Boys

Variable	*1*	*2*	*3*	*4*	*5*	*6*
1. Disordered eating	---	.32**	.14	-.22*	-.14	-.09
2. Bulimic Modeling	.58**	---	.04	.14	-.08	-.17
3. Appearance feedback	-.01	.14	---	-.09	-.24*	.06
4. Sibling Favoritism	-.12	.21	-.07	---	.01	-.08
5. Sibling Nurturance	-.05	-.06	-.10	.07	---	.23*
6. Sibling Quarreling	-.07	-.07	-.19	-.03	.18	---

Note. Results for girls are presented above the diagonal, and results for boys are presented below.

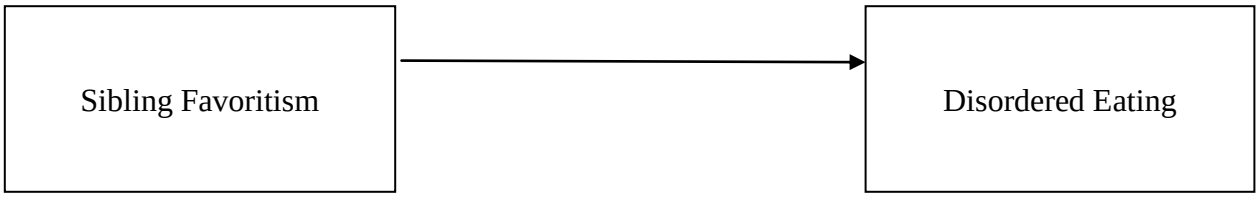
*p <.05 and **p<.001.

Table 6

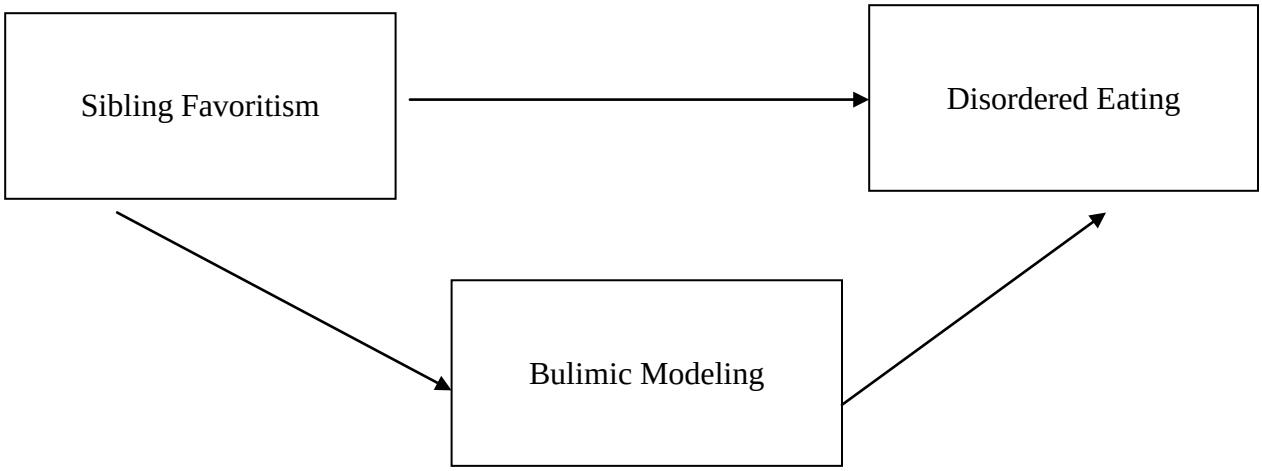
Regression Results for the Mediating Effects of Bulimic Modeling on the relation between Sibling Favoritism and Disordered Eating for Girls

Model	B	Std. Error	β
Model 1			
Outcome: Disordered Eating			
Predictor: Favoritism	-1.0	.46	-.22*
Model 2			
Outcome: Bulimic Modeling			
Predictor: Favoritism	.09	.07	.14
Model 3			
Outcome: Disordered Eating			
Predictor: Bulimic Modeling			
Model 4			
Outcome: Disordered Eating			
Predictor: Favoritism			
Mediator: Bulimic Modeling			

Note. *$p < .05$. Because the relationship between favoritism (predictor) and bulimic modeling (mediator) was not significant, additional analyses were excluded from this table.



a) Direct Effects Model



b) Mediation Model

Figure 1. Model investigating whether bulimic modeling mediates the relationship between sibling favoritism and disordered eating.

DISCUSSION

The purpose of the present study was to examine the connection between sibling relationships and disordered eating. Specifically, we focused on three dimensions of sibling relationship quality: nurturance, quarreling, and favoritism. Subclinical levels of disordered eating which include body dissatisfaction and negative eating attitudes were considered. Additionally, bulimic modeling was tested as a mediator to help explain the relationship between relationship quality and disordered eating. Family systems theory served as a theoretical framework to understand the results as they pertained to family relationships. Our hope is that these findings will expand the current understanding of family systems theory by making a theoretical place for the sibling subsystem. Additionally, feminist theory guided our understanding of group differences regarding age and gender of siblings and also shaped our perceptions of the implications for family therapy and prevention efforts.

Summary of Findings

Nurturance. Our results showed that disordered eating was not significantly related to sibling nurturance for either boys or girls. This may be a result of the age group of the sample. It has been found that as younger siblings transition into adolescence they need less nurturance from siblings because they are gaining more status and autonomy (Buhrmester & Furman, 1990; Vandell et al., 1987). Therefore, the level of nurturance between adolescent siblings may not be as important in predicting disordered eating as other relationship variables. Additionally, not all types of disordered eating behaviors are associated with sibling relationship quality. Studies suggest that the emotional eating behaviors of siblings are more similar as the relationship quality increases (de Leeuw et al., 2007; Feinberg & Hetherington 2000). For example, siblings dyads who had closer relationships with higher levels of warmth and affection tended to be more

alike in their emotional eating behaviors (de Leeuw et al., 2007). However, this relationship did not remain significant after a one year follow up. Additionally, in contrast to emotional eating, measures of external and restrained eating were not significantly related to sibling relationship quality (de Leeuw et al., 2007). Restrained eating in the previous study is closer to the type of eating behavior measured in our study. Therefore, the lack of relationship between restrained eating and sibling relationship quality in the de Leeuw study fits with the non-significant relationship between nurturance and disordered eating found in the present study.

Sibling nurturance and appearance feedback were significantly, negatively correlated for girls. This indicates that relationships with more nurturance had less appearance related feedback. This is consistent with previous research which suggests relationships that are more nurturing have more room for positive interactions and pro-social behavior (Buhrmester & Fuhrman, 1990). Critical discussion of a sibling's body can be considered a negative behavior, so it fits with the findings that a more nurturing relationship with a sister would result in less appearance related feedback. This also pertains to research which suggests that those with sibling relationships that are higher in warmth appear to be less threatened by their siblings (Noller, 2005 as cited in Dunn, 2000). The absence of appearance related comments might help foster a less threatening environment, which leads to a more nurturing relationship between siblings overall.

The inclusion of boys in this study is important as boys are often excluded from eating disorder research. In the present study, there were no significant relationships between nurturance and any other variable for boys, including disordered eating and appearance related feedback. The lack of significance among these variables may partially be explained through feminist ideology. Being nurturing and caring is a societal expectation for females in our culture.

These qualities are not typically reinforced for males and in fact, men are often discouraged from showing emotions (Brown, 1994). Within our results, this may help explain why nurturance was significantly related to appearance related feedback for girls only. Due to societal norms, males and females may receive comments about their appearance differently. This may help explain why appearance related feedback was more common for females, as it is more socially acceptable for females to discuss their appearance with one another and provide feedback or criticism. It is also possible that, due to societal expectations, nurturance and appearance related feedback are represented differently for males, which could explain the lack of significant findings in the current study. For example, perhaps appearance related feedback looks more like teasing or criticism in males as these are ways that men are often socialized to show their emotions.

Quarreling. The finding that conflict within sibling relationships was not related to disordered eating among girls and boys is in contrast to previous research on externalizing behaviors. For example, previous research has demonstrated a clear relationship between highly conflicted sibling relationships and antisocial behavior, which results in a lack of prosocial skills and increases in externalizing behaviors (Bank et al., 2004). Our results may then suggest that eating disorders are more closely connected to internalizing behaviors in boys and girls. Depression and negative affect are the two most common internalizing behaviors associated with eating disorders. In fact, depression is expected to be three times higher in women with eating disorders when compared to control groups (Wilksche & Wade, 2004; Gellar et al., 1998). Current research suggests that internalizing behaviors and eating disorders are more likely to be correlated in females than males (Grabraek & Cooper, 2008). The lack of conflict and quarreling may also suggest the presence of conflict avoidance. Some research has indicated that those with

eating disorders and their families are often conflict avoidant (Latzer & Gaber, 1998). These families were found to have limited tolerance for conflict and difficulty acknowledging and resolving problems (Minuchin, 1978). The lack of conflict in sibling relationships in those with disordered eating behaviors in the present study would fit with this current research.

Favoritism and disordered eating. The relationship between sibling favoritism and disordered eating was significant for girls only, such that more perceived favoritism of the sibling was associated with more disordered eating. It is possible that females place a higher value on the opinion of their parents, which may be a result of the closeness of the relationship. In general, females tend to have closer relationships with their parents than males and thus may be more influenced by parental perceptions (Caron, Lafontaine, Bureau, Levesque, & Johnson, 2012). Feminist theory would suggest that this is due to the reinforcement of expectations from the dominant culture. Within our society, mothers are expected to teach their children about connection and care for others while fathers are responsible for reinforcing the development of independence (Kenemore & Spira, 1996). As the cycle continues, daughters internalize the need to connect to others, such as their parents, while sons attempt to form a separate identity. This may help explain the closer nature of parent-daughter relationships and the significance of sibling favoritism among females in the current study.

The relationship between favoritism and disordered eating in girls in the present study may also be tied to competition and comparison. Favoritism involves an aspect of comparison between siblings as one feels as though she or he is being treated differently than another. For girls, as they transition through adolescence they are increasingly more likely to compare their appearance to their sisters (Coomber & King, 2008). Social comparison of physical attributes has historically been linked to disturbances in body image which could lead to disordered eating

(Thompson, Coovert, & Stormer, 1999.) The current findings fit with the previous research and hypothesis that increases in social comparison may be linked to disordered eating. Additionally, competition is also common among siblings, and favoritism is a behavior that involves competition for the emotional resources of the parents (Noller, 2005 as cited in Dunn, 2000). Competition within sibling relationships may manifest itself in comparisons, favoritism or competition of emotional resources. Social leaning theory suggests that eating disorders are perpetuated by imitation and competition (Vandereycken, 2011), two dynamics often found within sibling relationships. All of these factors may help explain the connection between competition and disordered eating within sibling relationships.

In the follow up mediation analyses we conducted, the relationship between favoritism and bulimic modeling among siblings was not significant. Therefore, sibling modeling could not mediate the relationship between favoritism and disordered eating. There is no evidence that modeling of bulimic behavior explains the connection between favoritism and disordered eating. Although not investigated in the present study, it remains possible that other sibling behaviors may explain the link between favoritism and disordered eating.

Bulimic modeling. The relationship between disordered eating and modeling of bulimic behavior was significant for both boys and girls. It is interesting to note that this was also the only significant correlation for boys. For both boys and girls, as the level of bulimic modeling within the sibling dyad increased, so did the level of disordered eating symptoms. This finding in girls fits with previous research that shows a significant relationship between dietary restriction and development of bulimic behavior in sister dyads (Coomber & King, 2008). Our findings are also consistent with previous research which suggests the presence of eating disordered behavior symptoms in one sibling may increase body dissatisfaction in the other sibling (Vandereycken &

Van Vreckem, 1992). The proximity of siblings to one another as well as the quality of the relationship may help explain these findings. Siblings that share the same space for a greater amount of time, such as those who share a room, may be more likely to model each other's behavior. Additionally, siblings who have close relationships and share interests may be more likely to pick up on eating disordered behaviors from each other. Previous research shows that siblings with relationships characterized by high levels of warmth, empathy and affection tend to have eating behaviors that are similar (de Leeuw et al., 2007). For example, as one sibling begins to develop an interest in dieting, he or she may influence the other sibling if they have a close relationship and communicate openly.

Group differences according to age. There were no statistically significant differences in the rates of disordered eating according to whether girls and boys had older, younger, or both older and younger siblings. However, there were differences between those who had an older sibling, younger sibling or both. In comparing these three groups for girls, those with younger siblings only had the highest rates of disordered eating. This is consistent with previous research examining emotional and external eating which found that younger sisters were more likely to influence older sisters in these two domains (de Leeuw et al., 2007). The findings in the present study of higher levels of disordered eating in girls with younger sisters may be influenced by the onset of puberty. For females, one outcome of puberty is weight gain. When the oldest sibling begins puberty she may have growth and weight changes while the younger sister does not. During adolescence, as appearance comparisons against younger siblings who have yet undergone puberty became more frequent, a preference for thinness was increased in older sisters (Tsiantas & King, 2001). However, the findings in the present study contradict other previous research which found that younger siblings have greater overall levels of body size distortion,

body dissatisfaction, and body shape concerns (Tsiantas & King, 2001). This previous research argues that sibling social comparisons may be a unidirectional process. From this perspective, younger sisters are more likely to engage in upward social comparisons while older siblings are less likely to make appearance comparisons with their younger siblings (Tsiantas & King, 2001). Our contradictory findings to this study could partially be explained by the argument that the sibling relationship is not a unidirectional process. Both siblings in a dyad are influenced by one another as well as the external forces that increase body dissatisfaction. Sisters, regardless of their place within the family, cannot escape the influence of the thin ideal. The extent that the thin ideal influences each sister may vary, but our study suggests that both siblings are influenced in a bidirectional way.

Contrary to the findings for girls, boys with older siblings had higher rates of disordered eating than those with younger siblings, or both younger and older siblings. This fits with current research which suggests that younger siblings are more likely to be teased by older siblings, which often results in eating disordered behavior (Eagles, Johnston, & Millar, 2005; Keery, Boutelle, van den Berg, & Thompson, 2003). From a feminist perspective, rates of teasing may be higher in younger brothers compared to younger sisters because teasing is a more acceptable form of interaction for boys, thereby resulting in higher levels of disordered eating among boys with older siblings. Additionally, the higher rates of disordered eating in boys who have older siblings, represents a dynamic interplay between gender, age and power. In our society, younger male siblings reflect a contradiction between these varying intersections of identity. On the one hand, males have more power within society; on the other, younger siblings typically have the least amount of power within the family dynamic. This contradiction might help explain the rates of disordered eating among younger brothers in the present study. Group

differences according to gender. Similarly to the previous findings, there were no statistically significant differences in the rates of disordered eating between participants that had a brother, sister, neither or both. However, differences between groups were found. We found that girls with both a sister and a brother had higher rates of disordered eating than those with only a brother or only a sister. However, boys with a brother only had the highest rates of disordered eating. Therefore, in both boys and girls, the highest levels of disordered eating included those with brothers. This suggests that the presence of a brother may increase the development of disordered eating behavior. From a feminist perspective, due to more power, perhaps brothers are more influential on the behavior of siblings.

Additionally, having a brother may serve as a risk factor for disordered eating due to the influence of teasing as a form of communication, especially regarding appearance. Appearance related teasing is a risk factor for body dissatisfaction and the development of disordered eating. Although peers are the most likely culprits of teasing, the rates of teasing by brothers is only slightly lower than that of peers (Rieves & Cash, 1996). Among family members, brothers are the most likely to perpetrate appearance teasing and criticism, and many participants indicated that brothers were worse teasers than sisters (Rieves & Cash, 1996). Further, when examining appearance related teasing by family members and peers, the most negative outcomes, including high levels of body image concerns, were associated with teasing perpetrated by older brothers (Keery et al., 2005). However, the results of the present study suggesting that higher levels of disordered eating exist in those who have a brother are also in contradiction to previous research which has suggested that having a female sibling may be a risk factor for disordered eating (Becker, 1980; Vandereycken & Van Vreckem, 1992). Perhaps the contradictory findings and

the lack of significant differences in the present study indicate that gender may not be as influential in the development of disordered eating as other variables.

Limitations

A limitation of this study was that our participants were relatively homogeneous in terms of ethnicity and socioeconomic status, such that the majority identified themselves as White and were living in a middle-class Midwestern city. In the past, eating disorders were thought to be "culture bound disorders" and specific to white, affluent women in the United States (Smolak & Striegel-Moore, 2002). However, recent research has shown that the lifetime prevalence rates of AN, BN, and BED are similar across non-Latino White, Latina, Asian, and African American women in the United States (Marques et al., 2011). Therefore, a homogenous sample may not be an issue, but care should be taken when generalizing results beyond non-white, middle-class samples.

This study also had measurement limitations. First, the study only considered subclinical symptoms, as clinical levels of disordered eating were not measured. Therefore, we cannot claim that various aspects of sibling relationships will lead to diagnosable eating disorders. However, based on the continuum hypothesis discussed previously, it is still worthwhile to study various levels of disordered eating. Subclinical and clinical levels of disordered eating are detrimental to both physical and emotional well-being. Second, we did not assess the frequency of contact that participants had with siblings. Differences in the type and amount of contact may result in differences in relationship dynamics, such that more contact which is positive in nature may increase nurturance. In the same way, higher levels of negative conflict may increase the level of fighting between siblings. Third, quality of relationship was assessed only through one sibling's perspective, which may have resulted in a bias. Measurement of both siblings' perceptions may

have provided more accurate and complete results. Additionally, methods which allow for observation of actual sibling interactions may provide different, or potentially richer, information. Observations would provide additional information pertaining to the variables studied, such as the intensity of conflict, what the conflict is about, and whether or not it involves violence. Also, observation of sibling interactions would provide insight into the dynamics of the relationship as well as the potential differences between the sibling with disordered eating symptoms compared to the sibling without. Adding parents into the observation would further provide a more accurate assessment of sibling favoritism.

There may also be several limitations in our measurements of sibling behaviors. As siblings are an understudied population when considering disordered eating, the subscale for the Perceived Sociocultural Influences on Body Image and Body Change Questionnaire had to be adapted for the present study. Therefore, there is no existent statistical information on the use of this scale in siblings with which to compare the current findings, and the reliability and validity of this scale with siblings is unknown. Similarly, our study was limited to examining four variables of sibling relationships, including nurturance, conflict, favoritism and bulimic modeling. Future research could investigate other sibling behaviors measured by the SRQ or focus on other constructs completely that have been studied within sibling research. For example, previous research on nurturance within sibling relationships has examined warmth, self disclosure and the number of positive interactions within the dyad (Buhrmester & Furman, 1990; Noller, 2005). Other variables relating to sibling conflict have included competition, dominance and autonomy (Buhrmester & Furman, 1990; Casper, 1990).

Due to the cross-sectional nature of the data, our results are purely correlational in nature. We are unable to conclude that difficulties within sibling relationships cause unhealthy behaviors

due to our lack of longitudinal or experimental data. Future studies should seek to replicate the findings of this study using more diverse samples, clinical assessments, more complete sibling assessment, and longitudinal data.

Strengths

While limitations must be considered, this study had several strengths and contributes to the field in a number of ways. Our sample was relatively large (N= 207) and representative of both males and females in middle school and high school. The inclusion of males is important as the prevalence of eating disorders within both genders continues to increase, but eating disorders are still often thought of as a "female-only" disorder. Males constitute an understudied population within eating disorder research. Both males and females within society experience a tremendous amount of pressure regarding body image, though the content may differ (Epel, Spanakos, Kasl-Goodley & Brownell, 1996). Men are more likely to experience pressure regarding the drive for muscularity which can have similar psychological consequences as the thin ideal (McCreary, Sasse, Saucier & Dorsch, 2004; McCreary & Sasse, 2000). Inclusion of both males and females within our sample allows for interpretation of similarities and differences in body image pressures and resulting disordered eating behaviors based on gender.

Although our results cannot be generalized beyond the limited age group, the use of an adolescent sample between the ages of 12 and 19 is a strength. The majority of studies on risk factors for disordered eating tend to focus on late adolescents or emerging adults. However, younger adolescents are also particularly vulnerable to the development of disordered eating. Body shape is a central way that people in American culture define attractiveness, and children internalize pressures to meet body shape ideals at a young age (Epel, Spanakos, Kasl-Goodley & Brownell, 1996). In particular, pressure regarding body shape is likely to increase during early

adolescence. Especially for girls, appearance comparisons begin to increase during the early stages of puberty, and this trend continues throughout adolescence (Tsiantas & King, 2001). Appearance related teasing is also thought to begin in childhood, with many girls reporting experiences of teasing by peers, friends and brothers (Rieves & Cash, 1996).

This age group of adolescence is also significant because subclinical symptoms may be especially high in adolescent populations with rates as high as 5.4% in a sample of 12-24 year olds (Hoek & van Hoeken, 2003; Whitehouse et al., 1992). An additional study found rates of subclinical BN to be as high as 15% in an adolescent sample (Stice & Killen, 1998). By studying younger adolescents at risk for eating disorders, it is possible to identify specific risk and protective factors at an earlier age. Such attention on early to mid-adolescence may provide insight into the development and prevention of disordered eating behaviors during later adolescence and early adulthood. Information regarding risk factors in earlier adolescence can also be useful knowledge for families and professionals. Thus, they can become be more educated regarding the signs and symptoms of disordered eating and more likely to detect symptoms and encourage individuals to seek help.

Furthermore, research focused only on child or adult siblings would miss the complexity that occurs when the youngest sibling reaches puberty and the relationship become more egalitarian (Buhrmester & Furman, 1990). Our study may provide insight into the changes in power, status and autonomy that occur within sibling adolescent dyads, particularly as they transition through puberty. At this age, siblings also play a significant role in the development of social skills and prosocial behavior. Adolescent sibling relationships that are high in conflict have been associated with the development of both internalizing and externalizing behaviors (Bank et al., 2004; Deater-Deckard et al., 2002; Kim et. al., 2007).

Our study had several methodological strengths. By using regressions, mediation and ANOVAs, our statistical methods were comprehensive. Regressions provided a baseline interpretation of correlations between variables while a mediation analysis provided possible explanations for these correlations. Additionally, ANOVAs allowed for the explorations of between group differences such as the constellation of the sibling dyad. By using ANOVAs, we were able to explore possible effects of age and gender on the sibling dyad.

This study also included the use of well- established measures including the ChEAT and the SRQ. These measures have demonstrated evidence of reliability and validity in both past research as well as the present study. The use of multiple subscales from the SRQ provided for a comprehensive examination of sibling relationships. By using the nurturance and conflict subscales, both positive and negative aspects of relationships were examined. Furthermore, by including the sibling favoritism variable, we used a family systems perspective to extend previous research on the impact of family subsystems and disordered eating. A family systems perspective of eating disorders examines the various familial subsystems which may serve as either risk or protective factors for disordered eating. Prior work on disordered eating has tended to isolate family subsystems, focusing separately on either the parent-child relationship or the sibling relationship. Most studies have focused primarily on the mother-daughter dyad, which have led towards mother-blaming. Researchers are trained to focus on the parent-child relationship as primary, and thus siblings are often left in the shadows (Blessing, 2007). However, sibling relationships are also primary in the family, and the quality of parent-child relationships can determine how well siblings relate to one another (Blessing, 2007). Therefore, inclusion of the sibling favoritism variable provides a valuable opportunity for exploration of

three family members and two primary relationships, which extends prior research using the family systems explanation of disordered eating.

Clearly, the inclusion of multiple sibling variables and examining the sibling relationship as a separate family subsystem makes this study unique. In fact, perhaps the most significant contribution of this study is the simple inclusion of siblings, which is an understudied population. Current literature shows support for the connection between disturbances in sibling relationships and disordered eating (Coomber & King, 2008; Vandereycken & Van Vreckem, 1992). However, it has been suggested that this research area has not grown due to the lack of an adequate place for siblings within current family, psychoanalytic and developmental theories (Blessing, 2007). Additionally, sibling relationships have often been treated as an extension of the parent-child relationship. Our study allows researchers to adjust their perspective slightly and consider the unique aspects of sibling relationships which make them distinct from any other relationship. Using family systems theory as a guide, our study makes the argument that while siblings function within the family system, they are a separate subsystem. Our study will ultimately expand the current literature base by making a theoretical place for siblings within family systems theory.

Implications

Implications for family therapy. Our results suggest numerous avenues for family therapy research and practice. Feminist family therapy is used as a lens to guide the expansion of therapeutic interventions using the concepts of autonomy, intentionality and equity. When therapists work to include these in family therapy for disordered eating they increase the likelihood that all voices of the family system are heard and all experiences understood. While family therapy is well researched, current studies are mixed regarding the effectiveness of

various approaches. Family therapy research for those with eating disorders would benefit from an increase in randomized-control studies as well as those that focus on the spectrum of disordered eating rather than just clinical AN (Smith & Cook-Cottone, 2011). However, family therapy is a well-established intervention for adolescents with AN and is on its way to being established across other eating disordered behaviors (Keel & Haedt, 2008; Smith & Cook-Cottone, 2011). Recently, family therapy was moved into the category of being "probably efficacious" for adolescents with BN and appears to be a viable treatment option for those with disordered eating (Keel & Headt, 2008; Lock et al., 2010). Additionally, due to the large amount of clinical research on eating disorders, there are few therapeutic models that work specifically with subclinical symptoms. Therefore, we are careful in applying our findings from a subclinical sample to models designed specifically for clinical symptoms. Due to the overlap in emotional distress as discussed in the continuity hypothesis, it is still a worthwhile effort to use findings from the current study to expand current clinical models and future subclinical models of family therapy.

Current studies on family therapy and eating disorders focus mainly on the relationship between the individual with disordered eating and her or his parents. For example, the Maudsley Method is a family-based treatment (FBT) that is well researched and has received empirical support for decreasing AN symptoms in adolescents (Loeb & le Grange, 2009). This method seeks to empower families as resources in recovery and lays treatment out into very specific phases. Family interventions for adolescents can be particularly difficult to navigate because teens are at an age where they are developing a balance between autonomy and connection to others. An important aspect of the Maudsley model is respect for adolescent autonomy (Keel & Haedt, 2008). This method is intentional to not undermine adolescent autonomy by ensuring

family members are not over-involved in therapy (Keel & Haedt, 2008). Future models for family therapy with eating disorders should mimic the Maudsley method by incorporating respect for adolescent autonomy.

While the Maudsley method shows promise, it includes interventions specific to only the parent-child subsystem, such as increasing parental support and decreasing parental self-blame (Loeb & le Grange, 2009). If it is an intervention in which all family members would be expected to attend, such as family meals, it is not specified in the model that siblings be included. As adolescents are often still living in the home with parents and siblings, including all family members in treatment can be important. Leaving out siblings does a disservice to clinicians as this relationship may have important implications for diagnosis, treatment and prevention. In the future, models for family therapy should be intentional about including siblings. Interventions should be specific to each subsystem within the family as well as the entire subsystem as a whole. For example, certain lines of questioning or interventions can be specific to the parent-child dyad or the sibling dyad. Other stages of therapy may involve all members at the same time equally. Additionally, feminist family therapy would guide the therapist to consider the lived experience of all members of the family by allowing each member to vocalize his or her experience with the eating disorder. This benefits the individual with the eating disorder as it shifts some of the focus on to other people. However, therapists need to be cautious about discussing the impact of the problem on the family without blaming the individual with the eating disorder.

The limited research that currently exists regarding sibling participation in therapy is qualitative in nature and not specific to disordered eating (Gustafsson, Engquist & Karlsson 1995). However, this research can provide insight into the role of siblings in therapy. In previous

work of individuals living with Schizophrenia, siblings were considered essential helpers in the process of therapy (Falloon et al., 1984). In a qualitative study which examined the family therapy experiences of children with psychiatric concerns and their family members, children were more likely to view sibling involvement in therapy as favorable than unfavorable (Gustafsson et al., 1995). Additionally, in a follow up test, all of the children in the study and their siblings had a decrease in disruptive behavior symptoms, which might indicate systemic change set into motion by family therapy (Gustafsson et al., 1995).

Clearly, siblings play an important role in therapy for treatment of psychiatric disturbances such as schizophrenia. It can then be assumed that siblings may play a similar role in the treatment of an eating disorder, as it is considered to be a psychiatric disturbance in the DSM-IV (APA, 2000). Similar to findings with clinical samples, including all members of the family in treatment specific to disordered eating allows for exploration of subclinical behaviors which are often learned within the family system. For example, previous research shows a significant relationship between dietary restriction and development of bulimic behavior in sister dyads (Coomber & King, 2008). From the perspective of the continuity hypothesis, both dietary restriction and bulimic symptoms are subclinical behaviors which can later develop into full blown eating disorders. Parallel to research with clinical samples, family therapy provides a place to explore the existence of these subclinical behaviors within various family subsystems. If these behaviors are identified while still in subclinical stages, it may allow for prevention of disordered eating.

In considering the different types of family therapy, clinicians have the options of conjoint therapy with all members together in session, or separated therapy. Conjoint family therapy has been found to result in greater improvements in patient-reported Eating Disorder

Inventory (EDI) scores than separated family therapy (Eisler et al., 2000). Therefore, having all family members together for treatment appears to be a worthwhile effort. Two family-based theories with interventions that can be applied specifically to those with eating disorders include Structural Therapy and Narrative Therapy (Nichols & Schwartz, 2008). Structural therapy was created specifically through working with adolescents with eating disorders and their family members (Liebman, Minuchin, & Baker 1974). This type of therapy allows families to examine their roles, boundaries and patterns of interaction to restructure the family system, which results in decreasing eating disorder symptoms. As mentioned, in the past, family therapists have unintentionally left out siblings during treatment. In attempt to intentionally incorporate siblings into structural family therapy, some of the key interventions may need to be reworked while paying closer attention to the sibling subsystem. For example, therapists can be intentional about exploring the roles and patterns of the sibling dyad, instead of only focusing on the parent and identified child.

Narrative therapy helps families to separate themselves from the eating disorder. In this way, the individual with the eating disorder and the family members work together to decrease the influence of the eating disorder. Instead of fighting with one another, they unite to combat the effects of disordered eating on the individual and family (Nichols & Schwartz, 2008). Narrative therapy would provide an effective way for each family member to share his or her experience of the eating disorder. Siblings may be hesitant to participate in therapy because so much of the family's time and energy has been focused on the individual with the eating disorder. Narrative therapy provides an excellent avenue to give siblings a chance to voice their experience. Narrative questioning would consider what the eaten disorder has stolen from the family and from the sibling relationship specifically. Therapy would center around the steps families can

take together to combat these effects and if there is anything positive that the family would like to hold on about this experience after the symptoms of the eating disorder have diminished.

Implications for family systems theory. As suggested by our study's results and consistent with previous research, families impacted by disordered eating may have decreased levels of quarreling due to conflict avoidance within the family system. Family therapy provides an avenue to address some of these systemic issues which might be avoided at home. Therapy also provides a space for therapists to hold family members accountable for addressing issues which may be uncomfortable and otherwise avoided. From a systems perspective, eating disorders are a symptom of issues within the larger familial system, and therapy can be a place to identify underlying familial problems that may have contributed to the disorder (Keel & Haedt, 2008). For those already at risk for eating disorders, there is also evidence that familial factors such as family conflict may serve as a moderating factor in the development of disordered eating behavior. (Klump et al., 2009). Family therapy can serve as a space to work through family conflict with the help of a trained professional and the inclusion of all members of the family system.

Treatment that includes parents, siblings and the identified client can quickly become complicated. Triangulation is common when there is disruption in a family system and involves a third member being pulled into the conflict between two others (Dallos & Vetere, 2012). A therapist may be helpful in decreasing this behavior in family systems. In the present study, sibling favoritism was one of the only variables to be significantly related to disordered eating. Therefore, professionals should be conscious of sibling favoritism and work to incorporate it into treatment with family systems. From a systems perspective, favoritism is thought to be associated with rigid patterns of family functioning. Within enmeshed families, parents project

"good" feelings on to the sibling who is favored and "bad" feelings onto the other sibling(s) (Brody et al., 1998). Parents and children then become locked into these patterns of behavior which are characterized by the perception that one child is good and the other bad. Favoritism is worth addressing within the context of families and eating disorders due to the presence of shame. Siblings who perceive themselves as disfavored are more likely to experience shame and internalizing behaviors, the result of which may be disordered eating (Brody et al, 1998). Our finding regarding the significant relationship between favoritism and disordered eating supports this connection.

However, clinicians need to be careful to address favoritism and shame within the family context without blaming parents. One way to do this is to discuss the prevalence of favoritism and remind parents that it is fairly common. One study found that 50% of a sample of 600 high school students reported perceived favoritism in their families (Harries & Howard, 1984). In another study, 65% of a sample of both siblings and parents reported that favoritism existed within their family system (Brody et al., 1998). Whenever there are more than two people in a family system, the dynamics become complex and parents can engage in this behavior without fully realizing it. Also, children may be more sensitive to preferential treatment and are more likely to state that it occurs than parents are (Brody et al., 1998). Clinicians need to find a balance between normalizing this behavior with parents but also holding them accountable for the detrimental effects of favoritism and shame. Similar to narrative therapy, once parents realize they are engaging in this behavior they can take responsibility for going along with it, but can also take a stand against it.

In the present literature on siblings and family therapy, it appears that just getting siblings to follow through on treatment is a barrier. In one study, the majority of siblings participated in

the initial session of family therapy but were less likely to follow through on subsequent sessions; only 11 of the 76 siblings attended three or more therapy sessions (Gustafsson et al., 1995). Clinicians should be mindful of this issue and work with parents to make sure that all members of the family are able to follow through with treatment. Barriers to sibling attendance in treatment might include sibling involvement in school or extracurricular activities and an inability to coordinate the schedules of all family members involved. Additionally, as therapy has traditionally focused on the identified patient and the parents, siblings may pick up on their lack of significance in therapy. Siblings might then be less likely to actively participate in therapy. The intentional efforts mentioned before to include sibling dyads as well as the questions which explore the lived experience of the sibling are crucial in increasing sibling follow through in treatment.

The sibling relationship should not be thought of as an extension of the parent-child relationship, or subsystem. Although influenced by parents, sibling subsystems have their own unique characteristics Clinical interventions specific to siblings would be important for several reasons. Certain factors like age and gender of a sibling have been found to be correlated with disordered eating (Vandereycken & Van Vreckem, 1992), but they are stable traits and cannot be changed. However, relational aspects are more flexible and may respond well to clinical interventions. For example, sibling knowledge of disordered eating and inclusion in family interventions are malleable (Honey et al., 2006). Clinical research can examine the impact that both of these have on the recovery of the sibling with disordered eating. By considering the unique aspects of sibling relationships, therapists can draw on strengths of the sibling subsystem and incorporate them into therapy. In a qualitative study mentioned previously, some children found it less embarrassing and anxiety-provoking to attend therapy if siblings were present

(Gustafsson et al., 1995). Therefore, similar to findings with clinical samples, professionals can use sibling relationships as a way to draw in children or adolescents who might otherwise be too uncomfortable to participate. Siblings reared in the same environment have a shared history and experience that is unlike any relationship with caregivers, friends or other family members. Therapists should draw on this shared sibling history to strengthen the alignment within the sibling subsystem. From a systems perspective, by strengthening alignments of various subsystems, the entire family system will be more likely to benefit from therapy.

Additionally, in our study, we found that the highest levels of disordered eating included sibling dyads with brothers. Clinical interventions should be mindful of including male siblings in treatment. Therapy involves communication, sharing emotions and expressing feelings which are thought to be the job of females in society. Feminist-informed clinical interventions would take into consideration the detrimental impact that socialization processes have on both males and females (Kannan & Levitt, 2009). To combat this, therapists informed from a feminist perspective would actively work to make sure that all members of the family system, regardless of gender, participate equally in therapy. In an attempt to treat all members of the family system equally, therapists adopt an egalitarian approach and incorporate a contextual perspective by considering the high rates of eating disorders among females (Kannan & Levitt, 2009). Through facilitation by a professional, family members would discuss the impact that male privilege has on the development of disordered eating. Both males and females within the family system would be asked to take accountability for the ways that they may promote the thin ideal or other behaviors that may lead to body dissatisfaction.

Prevention. Although parents and siblings can be extremely important during clinical treatment for eating disorders, a primary goal of eating disorder research is identification,

elimination and prevention of eating disorders at a larger systemic level. Prevention can begin first at the family level. Prevention efforts targeting subclinical behaviors such as body dissatisfaction can be easily woven into family settings that go beyond the clinical environment. Efforts should be made to educate family members in identifying various subclinical behaviors, who participates in them, and how they are reinforced within the home. Personal awareness is one of the first steps in eating disorder prevention, as it allows for family members to recognize which subclinical behaviors they may exhibit. Family members are then less likely to inadvertently reinforce unhealthy behaviors or attitudes towards body image (Carney & Scott, 2012; Akos & Levitt, 2002). Identifying underlying familial problems that may have contributed to the disorder is an important aspect of prevention work that can be infiltrated through a family assessment (Keel and Haedt, 2008.) In this way, family members become conscious of subclinical behaviors that they may be modeling and reinforcing to others.

At the next level, prevention of disordered eating happens through collaboration and consultation with adolescents, family members, teachers, professionals and community agencies (Carney & Scott, 2012). Often times, in schools and larger community settings, a needs consultation can be done to assess the significance of disordered eating within a particular population (Carney & Scott, 2012). Teachers and other professionals can help facilitate the same type of assessment in schools and larger communities. This can be done by having teachers, coaches and school board members consider the extent of body image issues within a particular school and student body population. Some aspects to consider in this assessment would include the prevalence and degree of severity of body image issues within the given population. This can be done through the use of standardized assessment tools designed for measuring body image disturbances and disordered eating. For example, the Eating Disorder Diagnostic Scale (EDDS)

is a brief self-report measure of Anorexia, Bulimia, and Binge-Eating Disorder. As it encompasses a large range of disordered eating symptoms and is shorter than most assessment tools it would be ideal for use in middle and high school populations (Stice & Telch, 2000). These assessments would provide schools with a baseline of the extent of body image issues within a given school. From here, school professionals can decide on the amount of education and prevention services that should be implemented within the school. Promoting healthy exercise, providing nutritional information and promoting body acceptance are all aspects of prevention efforts which would have an impact on overall health and well-being and could be implemented at a school or community level (Carney & Scott, 2012).

There are various prevention programs that already exist and are being used within school settings. For example, "The Body Project" is a widely used and empirically validated program that helps promote body acceptance in children and adolescents (Stice & Presnell, 2007). Examples of activities from this program that would be appropriate in educational settings would include discussion of the thin ideal, exploring "fat talk" and role playing ways to challenge negative body talk (Stice & Presnell, 2007). Many people participate in fat talk and promoting the thin ideal without realizing it. These behaviors can then lead to an increase in subclinical disordered eating symptoms. Implementation of programs like "The Body Project" would provide classroom discussion of ways to decrease fat talk and the thin ideal within the classroom and larger school. These education and prevention efforts by schools would encourage students and teachers to take accountability for the subclinical behaviors which they may exhibit. It would also encourage students and teachers to find concrete ways to stand against this type of behavior in an effort to increase body acceptance across the entire school setting.

Conclusion

In conclusion, studying the sibling subsystem and its relation to disordered eating has implications for family therapy, prevention efforts and extending the theoretical foundation of the family system. The significant relationship between disordered eating and modeling of bulimic behavior in both boys and girls supports previous research on body dissatisfaction and sibling relationships. Additionally, the use of a feminist lens to interpret gender and age differences helps us to conceptualize the significance of power among males and older siblings. The mean differences in gender and age suggest that sibling relationship quality is part of a very complex process and one of many variables that can lead to disordered eating behavior. The fact that sibling favoritism was one of the only significant direct relationships we found between siblings and disordered eating speaks to the importance of the entire family system. Future research should continue to utilize the sibling subsystem as a means of understanding the development of disordered eating behavior among adolescents. In order to ensure quality research in this area, siblings must be considered a legitimate part of the family system and not simply an extension of the parent-child relationship.

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APPENDIX A. CHILDREN'S VERSION OF THE EATING ATTITUDES TEST

(MALONEY, MCGUIRE & DANIEL, 1988)

Please circle the answer that best fits how often you do certain things.

How often….	Never	Rarely	Sometimes	Often	Usually	Always
1. Are you scared about becoming overweight?	0	1	2	3	4	5
2. Do you stay away from eating when you are hungry?	0	1	2	3	4	5
3. Do you think about food a lot?	0	1	2	3	4	5
4. Have you gone on binges where you feel that you might not be able to stop?	0	1	2	3	4	5
5. Do you cut your food into small pieces?	0	1	2	3	4	5
6. Are you aware of calorie content in foods that you eat?	0	1	2	3	4	5
7. Do you stay away from carbohydrates (e.g., breads, rice)?	0	1	2	3	4	5
8. Do you feel that others want you to eat more?	0	1	2	3	4	5
9. Do you vomit after eating?	0	1	2	3	4	5
10. Do you feel guilty after eating?	0	1	2	3	4	5
11. Do you think about wanting to be thinner?	0	1	2	3	4	5
12. Do you think about burning energy (calories) when you exercise?	0	1	2	3	4	5
13. Do others think you're too thin?	0	1	2	3	4	5

	Never	Rarely	Sometimes	Often	Usually	Always
14. Do you think about having fat on your body?	0	1	2	3	4	5
15. Do you take longer than others to eat?	0	1	2	3	4	5
16. Do you stay away from foods with sugar in them?	0	1	2	3	4	5
17. Do you eat diet foods?	0	1	2	3	4	5
18. Do you think that food controls your life?	0	1	2	3	4	5
19. Can you show self-control around food?	0	1	2	3	4	5
20. Do you feel that others pressure you to eat?	0	1	2	3	4	5
21. Do you give too much time and thought to food?	0	1	2	3	4	5
22. Do you feel uncomfortable after eating sweets?	0	1	2	3	4	5
23. Have you been dieting?	0	1	2	3	4	5
24. Do you like your stomach to be empty?	0	1	2	3	4	5
25. Do you enjoy trying new rich foods?	0	1	2	3	4	5
26. Do you have the urge to vomit after eating?	0	1	2	3	4	5

APPENDIX B. SIBLING RELATIONSHIP QUESTIONNAIRE (BUHRMESTER & FURMAN, 1990)

Note. [a]Sibling nurturance items used in study. [b]Sibling quarreling items. [d]Sibling favoritism items

Think of a sibling and answer the following questions about this sibling. If you do not have any siblings or if you do not have any contact with your siblings, please skip this section.

The phrase "this sibling" refers to _____ (please fill in brother/sister and age). For example, if you are answering these questions about your 20-year-old brother, Sam, write in "brother" and "20" in the blank space provided.

	Hardly at all 0	Not too much 1	Somewhat 2	Very much 3	Extremely much 4
1. Some siblings do nice things for each other a lot, while other siblings do nice things for each other a little. How much do both you and this sibling do nice things for each other?	0	1	2	3	4
2. How much do you show this sibling how to do things he or she doesn't know how to do?[a]	0	1	2	3	4
3. How much does this sibling show you how to do things you don't know how to do? [a]	0	1	2	3	4
4. How much do you tell this sibling what to do?	0	1	2	3	4
5. How much does this sibling tell you what to do?	0	1	2	3	4
6. Some siblings care about each other a lot while other siblings don't care about each other that much. How much do you and this sibling care about each other?	0	1	2	3	4
7. How much do you and this sibling go places and do things together?	0	1	2	3	4

	Hardly at all 0	Not too much 1	Somewhat 2	Very much 3	Extremely much 4
8. How much do you and this sibling insult and call each other names?	0	1	2	3	4
9. How much do you and this sibling like the same things?	0	1	2	3	4
10. How much do you and this sibling tell each other everything?	0	1	2	3	4
11. Some siblings try to out-do or beat each other at things a lot, while other siblings try to out-do each other a little. How much do you and this sibling try to out-do each other at things?	0	1	2	3	4
12. How much do you admire and respect this sibling?	0	1	2	3	4
13. How much does this sibling admire and respect you?	0	1	2	3	4
14. How much do you and this sibling disagree and quarrel with each other? [b]	0	1	2	3	4
15. Some siblings cooperate a lot, while other siblings cooperate a little. How much do you and this sibling cooperate with other?	0	1	2	3	4
16. How much do you help this sibling with things he or she can't do by him or herself? [a]	0	1	2	3	4
17. How much does this sibling help you with things you can't do by yourself? [a]	0	1	2	3	4
18. How much do you make this sibling do things?	0	1	2	3	4
19. How much does this sibling make you do things?	0	1	2	3	4
20. How much do you and this sibling love each other?	0	1	2	3	4

	Hardly at all 0	Not too much 1	Somewhat 2	Very much 3	Extremely much 4
21. Some siblings play around and have fun with each other a lot, while other siblings play around and have fun with each other a little. How much do you and this sibling play around and have fun with each other?	0	1	2	3	4
22. How much are you and this sibling mean to each other?	0	1	2	3	4
23. How much do you and this sibling have in common?	0	1	2	3	4
24. How much do you and this sibling share secrets and private feelings?	0	1	2	3	4
25. How much do you and this sibling compete with each other?	0	1	2	3	4
26. How much do you look up to and feel proud of this sibling?	0	1	2	3	4
27. How much does this sibling look up to and feel proud of you?	0	1	2	3	4
28. How much do you and this sibling get mad at and get in arguments with each other? [b]	0	1	2	3	4
29. How much do both you and your sibling share with each other?	0	1	2	3	4
30. How much do you teach this sibling things that he or she doesn't know? [a]	0	1	2	3	4
31. How much does this sibling teach you things that you don't know? [a]	0	1	2	3	4
32. How much do you order this sibling around?	0	1	2	3	4
33. How much does this sibling order you around?	0	1	2	3	4
34. How much is there a strong feeling of affection (love) between you and this sibling?	0	1	2	3	4

	Hardly at all 0	Not too much 1	Somewhat 2	Very much 3	Extremely much 4
35. Some kids spend lots of time with their siblings, while others don't spend so much. How much free time do you and this sibling spend together?	0	1	2	3	4
36. How much do you and this sibling bug and pick on each other in mean ways?	0	1	2	3	4
37. How much are you and this sibling alike?	0	1	2	3	4
38. How much do you and this sibling tell each other things you don't want other people to know?	0	1	2	3	4
39. How much do you and this sibling try to do things better than each other?	0	1	2	3	4
40. How much do you think highly of this sibling?	0	1	2	3	4
41. How much does this sibling think highly of you?	0	1	2	3	4
42. How much do you and this sibling argue with each other? [b]	0	1	2	3	4

	My sibling almost always gets treated better 0	My sibling often gets treated better 1	We get treated about the same 2	I often get treated better 3	I almost always get treated better 4
43. Who usually gets treated better by your mother, you or this sibling? [d]	0	1	2	3	4
44. Who usually gets treated better by your father, you or this sibling? [d]	0	1	2	3	4
45. Who gets more attention from your mother, you or this sibling? [d]	0	1	2	3	4

46. Who gets more attention from your father, you or this sibling? [d]	0	1	2	3	4
47. Who does your mother usually favor, you or this sibling? [d]	0	1	2	3	4
48. Who does your father usually favor, you or this sibling? [d]	0	1	2	3	4

My sibling almost always gets treated better	My sibling often gets treated better	We get treated about the same	I often get treated better	I almost always get treated better
0	1	2	3	4

APPENDIX C. BULIMIC MODELING SCALE (STICE, 1998) WITH ADAPTED SIBLING ITEMS

Please indicate the frequency of each of the following occurrences. If you do not have contact with your mother, father, or siblings, please skip those particular sections.

	Never		Sometimes		Often
1. My mother has dieted to lose weight	0	1	2	3	4
2. My mother has felt bad about herself because of her weight	0	1	2	3	4
3. My mother has fasted, exercised excessively, or used laxatives or diuretics to lose weight	0	1	2	3	4
4. My mother has gone on out-of-control eating binges (eaten huge amounts of food in a short period)	0	1	2	3	4
5. My mother has vomited to lose weight	0	1	2	3	4
6. My father has dieted to lose weight	0	1	2	3	4
7. My father has felt bad about himself because of his weight	0	1	2	3	4
8. My father has fasted, exercised excessively, or used laxatives or diuretics to lose weight	0	1	2	3	4
9. My father has gone on out-of-control eating binges (eaten huge amounts of food in a short period)	0	1	2	3	4
10. My father has vomited to lose weight	0	1	2	3	4
11. My friends have dieted to lose weight	0	1	2	3	4
12. My friends have felt bad about themselves because of their weight	0	1	2	3	4
13. My friends have fasted, exercised excessively, or used laxatives or diuretics to lose weight	0	1	2	3	4
14. My friends have gone on out-of-control eating binges (eaten huge amounts of food in a short period)	0	1	2	3	4
15. My friends have vomited to lose weight	0	1	2	3	4

	Never		Sometimes		Often
16. My siblings have dieted to lose weight [a]	0	1	2	3	4
16. My siblings have dieted to lose weight [a]	0	1	2	3	4
17. My siblings have felt bad about themselves because of their weight[a]	0	1	2	3	4
18. My siblings have fasted, exercised excessively, or used laxatives or diuretics to lose weight[a]	0	1	2	3	4
19. My siblings have gone on out-of-control eating binges (eaten huge amounts of food in a short period)[a]	0	1	2	3	4
20. My siblings have vomited to lose weight[a]	0	1	2	3	4
21. I've seen people in the media (e.g., magazines, TV) diet to lose weight	0	1	2	3	4
22. I've seen people in the media (e.g., magazines, TV) feel bad about themselves because of their weight	0	1	2	3	4
23. I've seen people in the media (e.g., magazines, TV) fast, Exercise excessively, or use laxatives or diuretics to lose weight	0	1	2	3	4
24. I've seen people in the media (e.g., magazines, TV) go on out-of-control eating binges (eaten huge amounts of food in a short period)	0	1	2	3	4
25. I've seen people in the media (e.g., magazines, TV) vomit to lose weight	0	1	2	3	4

APPENDIX D. PERCIEVED SOCIOCULTURAL INFLUENCES ON BODY IMAGE AND BODY CHANGE QUESTIONNAIRE (McCABE & RICCIARDELLI, 2001) WITH ADAPTED SIBLING ITEMS

Note. [a]Items used in present study to measure sibling bulimic modeling

Please circle the answer that best fits how you perceive feedback from your *siblings*. If you do not have any siblings or if you do not have any contact with your siblings, please skip this section.

	Extremely Negative	Negative	Neutral	Positive	Extremely Positive
1. What type of feedback do you receive from your siblings about your body size and shape?	0	1	2	3	4
2. What type of feedback do you receive from your siblings about your eating patterns to change your body size and shape?	0	1	2	3	4
3. What type of feedback do you receive from your siblings about your level of exercise to change your body size and shape?	0	1	2	3	4