Using distance regulation for the study of sibling relationship quality, romantic relationships, and interpersonal and intrapersonal factors

DISSERTATION

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Abstract

The sibling bond is likely the longest, most resilient relationship in one’s life. Subsequently, the sibling relationship is a strong predictor of outcomes across the lifespan, including positive intimate relationships, feelings of self-worth, and social skills. The purpose of this dissertation was to use Bowen Family Systems Theory (BFST) to examine individual’s perception of their sibling relationships and the connection with interpersonal and intrapersonal factors, and to explore the congruence of sibling and romantic relationship distance regulation.

Online research listservs were used to recruit participants (N=476). A cross-sectional descriptive survey design was used to explore quantitative survey items. The Lifespan Sibling Relationship Scale (LSRS) was used to assess the sibling relationship in childhood and adulthood. The Social Connectedness Scale-Revised (SCSR) and the Separation-Individuation Test of Adolescence (SITA) were used to measure distance regulation. Interpersonal and intrapersonal factors included depression, general perceptions of health, and couple relationship satisfaction.

BFST was used to explore four hypotheses: 1) The “closest” siblings will be same-sex dyads, with sisters being the closest among all the dyads; 2) Siblings that are <= 2.5 years of age will have a closer relationships than those > 2.5 years apart in age; 3) Individuals’ perceptions of the sibling relationship in childhood and adulthood are related; and 4) The sibling relationship in childhood and adulthood are predictive of
inter/intrapersonal factors. In addition, three research questions were explored: 1) Are there common characteristics of the selected “influential sibling” for participants with more than one sibling?; 2) What is the relationship between sibling and couple distance regulation?; and 3) To what extent does sibling and couple distance regulation mediate the influence of the sibling relationship on inter/intrapersonal factors?

Correlations confirmed a significant relationship between the sibling relationship in childhood and adulthood \((r(476) = .45, p < .001)\). A one-way ANOVA demonstrated sisters were the closest on both the LSRS \((F(3, 458) = 7.87, p < .001)\), and the SCSR \((F(3, 458) = 5.38, p = .001)\). There were not significant differences between siblings > or <= 2.5 years apart in age.

The subsample of participants in a romantic relationship was used \((n=338)\) to test the conceptual model using structural equation modeling. First, a direct effects model assessed the influence of the adult and sibling relationship on depression, general perceptions of health, and couple relationship satisfaction. Results showed significant paths from the child sibling relationship to depression \((\beta = -.14, p < .05)\) and couple relationship satisfaction \((\beta = .21, p < .05)\). Then, sibling and couple distance regulation were added as mediating variables to complete the model. Fit indices for the overall model were strong: \(X^2(56) = 76.41\ (p = .036);\) NFI = .974; CFI = .993; RMSEA = .033. There were significant indirect effects of the paths from the child sibling relationship, through couple distance regulation, to general perceptions of health \((\beta = .04, p < .05)\), depression \((\beta = -.02, p < .05)\), and couple relationship satisfaction \((\beta = .29, p < .05)\).
These results provide evidence for the importance of the sibling relationship in childhood on interpersonal and intrapersonal factors in adulthood. Additionally, distance regulation may be a useful concept to examine how this influence occurs. Applications of the results to mental health clinicians, and strengths, limitations and future directions are discussed herein.
This dissertation is dedicated to

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to Vance and Vincent, who are my sources of pure joy and fun,

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Chapter 1: Introduction

Approximately 85% of the individuals living in the United States (U.S.) have at least one sibling (Milevsky, 2013), and it is likely that the sibling relationship will be the longest and most resilient in one’s life (McHale & Crouter, 1996; Sanders, 2004). Researchers in family science have shown that qualities of the sibling relationship can be a strong predictor of outcomes across the lifespan, including more positive intimate relationships (Updegraff, McHale, & Crouter, 2001), feelings of self-worth (Feinberg, Solmeyer, & McHale, 2012), and social skills (Pike, Coldwell, & Dunn, 2005). Furthermore, the sibling relationship may be protective against adverse outcomes, like being bullied and negative parenting practices (Bank, Burraston, & Snyder, 2004; Noland, Liller, McDermott, Coulter, & Seraphine, 2004).

Despite the high prevalence of individuals in the U.S with siblings, and the current literature that demonstrates the positive and protective influence of the sibling relationship, family scholars have paid considerably less attention to siblings compared to other family relationships (i.e., co-parent, parent-child; Feinberg, et al., 2012). To advance the sibling literature, ecologically-based, systemic theoretical frameworks to study sibling processes and the development of the sibling relationship within the family context are needed (McHale, Updegraff, & Whiteman, 2012). This research could aid in the design of future family–based clinical interventions that include siblings, a current gap in the sibling literature (Feinberg, Solmeyer, McHale, 2012; Milevsky, 2013).
One of the first theoretical frameworks to operationalize family systems is Bowen Family Systems Theory (BFST). Recently, researchers have used the concept of distance regulation to study differentiation, the hallmark concept of BFST, to examine the sibling relationship (Ferriby, 2015). Therefore, the purpose of this study was to: 1) investigate whether the relationship between sibling structural variables (i.e., age difference, gender composition) and the sibling relationship in the current sample aligns with the consensus amongst scholars that study siblings; 2) examine individual’s perceptions of the sibling relationships and the connection with interpersonal (i.e., relationship satisfaction) and intrapersonal (i.e., mental health) factors; and 3) explore the congruence of sibling and romantic relationship distance regulation. Figure 1 illustrates the original conceptual model of the relationships between these variables that was tested using structural equation modeling (SEM).

To accomplish this purpose, data on sibling relationships, romantic relationships, and inter/intrapersonal factors were collected using online surveys. Chapter 1 provides a summary of the current study, introduction to the background and significance, research questions and hypotheses, and concludes with a brief review of the methodology and analysis. Chapter 2 contains a review of the research on BFST, sibling relationship quality and influence on individual outcomes, and concludes with the hypotheses and research questions. Chapter 3 contains a description of the methodology. Detailed results are provided in Chapter 4. Finally, a discussion of results, limitations, recommendations for future research, and clinical implications, including recommendations for family-based clinical interventions including siblings, are discussed in Chapter 5.
Background and Significance

To understand the sibling relationship and its impact on inter/intrapersonal outcomes in the family context, BFST was the theoretical framework used for the current study. The foundation of BFST is the concept of differentiation, defined by Bowen (1972) as one’s ability to balance feelings of independence and connectedness in relation to others. Simply put, it is one’s ability to regulate emotional and physical distance from other members of a system. Although the research on BFST and differentiation are limited, the available literature shows an association between differentiation and interpersonal (i.e., marital satisfaction; McCullough, 2006) and intrapersonal factors (i.e., psychological symptomatology; Bartle-Haring, Rosen & Stith, 2002; Bartle-Haring & Lal, 2010).

Another concept of BFST is sibling position (Bowen, 1972; Kerr & Bowen, 1988). Historically, the research on siblings has focused on variables, like position, and other structural aspects of two siblings that compose a dyad, like gender composition (Feinberg, Solemeyer, McHale, 2012). For example, sibling research has historically examined the effect of sibling position or birth order on individual outcomes, like IQ (Galton, 1874). Structural aspects of the sibling dyad, including age difference, gender composition, and genetic relatedness are still of interest to contemporary scholars that study siblings to determine how these variables affects the sibling relationship. This dissertation aimed to confirm the current consensus that certain structural variables of the sibling dyad, like gender composition and difference between siblings’ ages, have an influence on sibling relationship quality (SRQ). Specifically, this study tested whether
same-sex siblings were closer than mixed-sex siblings, with sisters being the closest of the dyads, and whether siblings <= 2.5 years apart in age were closer than those that are >2.5 years (Objective 1).

In the 1980’s, researchers that study siblings shifted their focus from structural variables to sibling relationship processes (i.e., influence) and the impact of process variables on individual developmental trajectories (Howe & Recchia, 2014). Scholars suggest that components of the sibling relationship that differentiate it from other intimate relationships, like the overlap of the environment and genetics, give siblings the opportunity to be highly influential on one another, beyond that of parents and peers (Caspi, 2010; Feinberg, Solmeyer, & McHale, 2012; McHale et al., 2001; Milevsky, 2013).

More recently, scholars that study sibling relationships have been interested in bidirectional processes, like interaction and influence (McHale et al., 2012; Feinberg et al., 2012; Whiteman et al., 2011). Siblings influence one another’s socioemotional development, psychological adjustment, and cognitive development, with older siblings having more influence on younger siblings (McHale, Updegraff, & Whiteman, 2012). This dissertation aimed to expand this literature on sibling influence by exploring the connection between sibling relationship quality (SRQ) and inter/intrapersonal factors (Objective 2). The definition of SRQ includes the bidirectional and reciprocal levels of warmth and conflict between two siblings, where warmth refers to feelings of closeness, support, trust, and general positive feelings about the sibling relationship (Lee, Mancini, & Maxwell, 1990).
Positive SRQ, defined as high levels warmth and lower levels of conflict, is associated with intrapersonal factors for each member of the sibling dyad like, the development of morality, better psychological adjustment (Dunn, Brown, & Maguire, 1995; Gass, Jenkins, & Dunn., 2007), higher levels of self-esteem (Brody, 2004), and lower levels of externalizing behaviors (Milevsky, 2005). Additionally, positive SRQ can compensate for risk factors and their associated interpersonal adverse outcomes, including the impact of poor peer relationship quality on adjustment outcomes (East & Rook, 1992; Milevsky, 2005; Updegraff & Obeidallah, 1999), and the effects of negative mother-child interactions on academic outcomes (Milevsky & Levitt, 2005). Conversely, negative SRQ, classified by high levels of conflict and low levels of warmth, is associated with higher levels of externalizing issues, delinquent behaviors (Slomkowski et al., 2001), and the development of problem behaviors later in life (Gass et al., 2007).

The third objective of the current study was to examine distance regulation within the sibling relationship and the potential congruence with distance regulation within romantic relationships. Distance regulation is rarely studied in the sibling relationship; those who have studied it within siblings suggest that distance regulation may influence SRQ, individual outcomes, and offer new insight into sibling interactions (Ferriby, 2015). Sibling relationship processes that are frequently cited in the literature, like modeling (i.e., development of similar characteristics, behaviors, or qualities between siblings) and de-identification (i.e., one sibling intentionally differentiating from the other; Whiteman, Jensen, & Maggs, 2014) could be interpreted as sibling distance regulation processes. Additionally, sibling scholars have started to explore the influence of sibling relationships...
on romantic relationship formation. Many qualities of sibling and romantic relationships are similar, like companionship, intense display of emotions, power, and control. The sibling relationship may be the initial context where skills are developed to manage relational issues (i.e., negotiating conflict; Doughty, McHale, & Feinberg, 2015). Thus, it is possible that distance regulation in sibling relationships is congruent with the distance regulation in romantic relationships.

**Research Questions and Hypothesis**

To investigate the three objectives, the following hypothesis and research questions were developed for the current study.

Based on previous research, it was expected that:

H1: Within the selected sibling dyads, the closest siblings will be same-sex dyads, with sisters being the closest.

H2: Within the selected sibling dyads, siblings <= 2.5 years of age will have a closer relationship than siblings with an age gap > 2.5 years.

H3: Perceptions of the sibling relationship in childhood are related to perceptions of the sibling relationship in adulthood.

H4: Sibling relationship quality in childhood and adulthood are predictive of intrapersonal (i.e., depression) and interpersonal factors (i.e., relationship satisfaction).

To investigate the relationship between SRQ, sibling distance regulation, couple distance regulation, and inter/intrapersonal factors, a conceptual model was tested using Structural Equation Modeling (SEM) to explore the following research questions:
R₁: Are their common characteristics of the “influential sibling” for participants that have more than one sibling?

R₂: What is the relationship between sibling distance regulation and couple distance regulation?

R₃: To what extent does couple distance regulation and sibling distance regulation mediate the relationship between SRQ and inter/intrapersonal factors?

**Research Design and Methodology**

To investigate the hypothesis and research questions, surveys were administered to participants to measure their relationship with their most influential sibling, sibling distance regulation, romantic relationship distance regulation and satisfaction (if applicable), and inter/intrapersonal factors. The study was conducted online using survey methodology. If participants were between the ages of 18 and 75, had one sibling growing up (full, half, adopted, etc.), and could read English and answer the survey questions, they were eligible to participate. Power analysis revealed that a minimum of 92 participants would be needed to provide statistical power to complete the intended analysis (α=.05, d=.8). Participants were recruited through the online research listservs, ResearchMatch© and Study Search. If participants indicated they were interested in the study, they were sent a link that directed them to a Qualtrics survey. After consenting to participate in the study, participants were instructed to answer several questionnaires. The final sample used for analysis was 476, with 338 of those participants indicating they were in a romantic relationship. A cross-sectional descriptive design will be used to explore the quantitative survey items. Structural equation modeling was used to examine
the direct and indirect relationships between the variables. Results, a discussion of those results, strengths, limitations, and implications for future research and current clinical practice are discussed in Chapters 4 and 5.
In Chapter 2, an overview of BFST is provided as the theoretical framework for this study, including a discussion of differentiation and distance regulation. The current body of research on sibling relationships used to develop the conceptual model (Figure 1), specifically SRQ, the associations of SRQ and influence on individual developmental trajectories are summarized. Finally, the chapter concludes with the purpose, hypothesis, and research questions for the study. For this study, siblings are defined as “people who lived in the same home the majority of the days (> 4 days) per week growing up.” This definition is intentionally broad to be inclusive of the variety of sibling dyads (e.g., ‘raised as siblings’) instead of using a traditional definition that requires a level of genetic relatedness (e.g., half or full) to include siblings in family science research. For a list of other key terms and their operational definitions, see Table 1 (Appendix B).

**Theoretical Framework**

A variety of theoretical frameworks have been used to guide sibling research, including: social contagion theory (e.g., Rende et al., 2005), attachment theory (e.g., Whiteman, McHale, & Soli, 2011), family systems theory (FST; e.g., Whiteman, McHale, & Crouter, 2003), and social learning theory (SLT; e.g., Slomkowski et al., 2001). SLT is the most common framework used to study sibling dynamics, but the principles of SLT do not account for sibling relational variables (i.e., SRQ) and the incongruent behaviors between the sibling and other family subsystems (Whiteman, McHale, & Soli, 2011). The study of sibling relational variables on individual outcomes
across the need to conceptualize the sibling subsystem within the family context suggests the use of ecologically-based theories, like FST and BFST (McHale, Whiteman, Kim, & Crouter, 2007; McHale, Updegraff, & Whiteman, 2012). The following paragraphs discuss the history of FST, Murray Bowen’s process of operationalizing FST concepts to create BFST, and relevant tenants of BFST used for this study applied to the sibling relationship within the family context.

**Family Systems Theory**

Family systems theory originated from von Bertalanffy’s (1973) seminal work on General Systems Theory. According to FST, family systems and its subsystems are hierarchically organized, interdependent, and reciprocally influence each other. Subsystems in a healthy family have flexible boundaries and adapt to changing contexts whereas unhealthy families have too rigid or too permeable boundaries, and attempt to maintain homeostasis and viability through rigid adherence and frequent fluctuation of family roles and rules. Families are open systems and are influenced by their environment, including larger societal, economic, and cultural forces (Bowen, 1966; Minuchin, 1967). Therefore, FST encourages scholars to study siblings within their familial and greater environmental context.

**Bowen Family Systems Theory**

Murray Bowen, a psychiatrist, developed BFST in the 1940’s and 50’s based on his work with patients diagnosed with schizophrenia and their families. During this time, Bowen used FST to conceptualize schizophrenia as a pathology related to the dysfunction of the family unit, as opposed to an individual pathology. He noted when patients would
recover from symptoms of their psychopathology (i.e., schizophrenia), they would often relapse upon reunion with their families, or another member of the family would exhibit negative symptoms (Bowen, 1966). Many acknowledge his work with schizophrenia in families as the development and first application of FST (Kerr & Bowen, 1988). Additionally, BFST was one of the first theories employed in the field of marriage and family therapy (MFT; Olson, 1970).

In the seventies, Bowen’s students Michael Kerr, Philip Guerin, and Thomas Fogarty continue to develop BFST. In the late eighties, Monica McGoldrick and Betty Carter contributed a feminist, ‘multi-contextual’ lens to the theory (Carter & McGoldrick, 1988). More recently, David Schnarch used BFST as the foundation for his work with sexual dysfunction in *The Sexual Crucible* (Kerr & Bowen, 1988; Schnarch, 1991). There are six original tenants of BFST, with two that developed later: 1) Differentiation of self, 2) Triangles, 3) Multigenerational transmission process, 4) Nuclear family emotional system, 5) Family projection process, 6) Sibling position, 7) Emotional cutoff, and 8) Societal emotional processes (Kerr & Bowen, 1988). Differentiation of self and sibling position are expanded upon below due to their relevance to the dissertation.

**Relevant Concepts of BFST**

**Differentiation-of-self.** The concept of differentiation is the cornerstone of BFST and applies to individual, subsystem, or family system levels. Differentiation is the degree to which one’s emotions and intellect are fused (Bowen, 1985). It is more simply defined as self-knowledge (Carter & McGoldrick, 1988), or the ability to regulate one’s emotional and physical distance from others (Skowron, Holmes, & Sabatelli, 2003).
Family science scholars use the term “distance regulation” in place of Bowen’s concept of differentiation because both address the same dimensions of autonomy and intimacy within the individual and the family system, with differentiation more focused on intrapsychic characteristics and distance regulation more focused on physical and emotional distance in interpersonal relationships (Allison & Sabatelli, 1988; Bowen, 1976). The philosophical underpinnings of differentiation are complex and difficult to measure, there are very few reliable and frequently used measurements of differentiation and the term ‘differentiation’ is often used in the sibling literature in a colloquial manner (e.g., siblings differentiate themselves from each other by having different interests), so this study will use the concept of distance regulation (Day, Gavazzi, & Acock, 2001; Miller, Anderson, & Keala, 2004). The concept of distance regulation will be defined using Bowen’s conceptualization of differentiation at the system-level. The “undifferentiated family ego mass” is a concept introduced by Murray Bowen to illustrate system level differentiation. Bowen (1961) suggested, "On one level each family member is an individual, but on a deeper level, the central family group is as one" (p. 45). A differentiated system allows individual members to experience a balance of separateness and togetherness that is not to the detriment of the other individual members and the overall system functioning (Cohen, Vasey & Gavazzi, 2003; Gavazzi, 1993; Sabatelli & Anderson, 1991). After the following review of the literature on differentiation, the term ‘distance regulation’ is used in place of differentiation.

Individuals with low levels of differentiation are easily influenced by the others who are part of a group (i.e., family, peers, and community), and will adapt to blend-in or
conform to the group norm. Bowen labeled this experience as the “pseudo-self.” Family members with low levels of differentiation may be co-dependent and highly reactive. In times of stress and high anxiety, poorly differentiated people are quick to exhibit emotionally-charged reactions and often look to others for direction on how to manage the situation (Bowen, 1966).

Those with high levels of differentiation stay calm and levelheaded when facing stressful circumstances. Their personal value system is not easily influenced by others and serves as their guide in situations where high levels of anxiety are present. Their emotions do not overrun their logic and intellect, so they can choose how to manage those situations. Differentiation exists on a continuum and can change during different life stages and transitions, but the overall goal is to be highly differentiated (Bowen, 1985). An individual that is highly differentiated or, as Bowen labels it the “solid-self,” can separate feelings from facts, making them less vulnerable to anxiety and are more able to recover from disruptions in their relationships (Bowen, 1991).

Highly differentiated individuals are more skilled in managing or regulating, their emotional distance from others than those with low levels of differentiation. People fluctuate the need to be emotionally close or distant from others across their lifespan. Those that are not able to effectively regulate that distance may become “fused” (lose their identity to a couple or group identity) or “cutoff” (sacrificing a group identity for total autonomy). Distance regulation that is considered “healthy” is the ability to balance separateness and closeness so that one can maintain a solid-self while still holding membership in a couple or group. Obtaining this balance between separateness and
closeness with others is a fundamental aspect of maturation and personal growth (Brown, 1999).

Much of the empirical research on BFST uses the concept of differentiation. Per the literature, lower levels of differentiation are associated with increased stress and psychological symptoms (Harvey & Bray, 1991; Bartle-Haring, Rosen & Stith, 2002). Higher levels of differentiation can predict better overall health, well-being, and lower distress (Bartle-Haring & Lal, 2010). Differentiation is also linked to marital satisfaction and adjustment (McCullough, 2006; Adams, 2004; Skowron, 2000), coping with stress (Murdock, Gore, & Horosz, 1998), lower potential for young adults to physically abuse their children (Skowron & Platt, 2001), and higher levels of psychological and interpersonal well-being over time (Skowron, Stanley, & Shapiro, 2009). Scales used to measure the Bowenian concept of differentiation include, The Chabot Emotional Differentiation Scale (Chabot, 1993), the Crucible Differentiation Scale (Schnarch, & Regas, 2012), the Personal Authority in Family Systems Questionnaire (Bray et al., 1984), and the Adult Behavioral and Emotional Reactivity Index (Bartle-Haring et al., 2005). The most frequently cited scale in the literature is the Differentiation of Self Inventory (DSI; α= .88). The DSI has four subscales that measure emotional reactivity (α=.84), taking an “I” position (α=.83), emotional cutoff (α=.82), and fusion with others (α=.74; Skowron & Friedlander, 1998).

Although the DSI has categories that examine facets of closeness (i.e., fusion) and separateness (i.e., cutoff), the scale conceptualizes differentiation as a sum of all the subscales, with higher scores indicating higher levels of differentiation. This is inherently
problematic, as there are many points across the lifespan where varying levels of closeness or separateness are healthy or necessary. For example, it is an important developmental task of an adolescent to explore her identity, which requires a healthy level of separateness from her family of origin. Furthermore, researchers suggest that a bidimensional model of measuring differentiation (i.e., measuring both closeness and separateness separately) is a better fit than the use of a unidimensional model, like the DSI (Cohen, Vasey, & Gavazzi, 2003). Therefore, this study uses the Family Distance Regulation (FDR) measure, which assesses closeness and separateness as separate constructs. The FDR includes selected items from the Social Connectedness Scale-Revised (SCS-R; Lee, Draper, & Lee, 2001) and the healthy separation subscale of the Separation-Individuation Test of Adolescence (SITA: Levine, Green, & Millon, 1986).

**Sibling Position.** Bowen’s concept of sibling position is based on the original work of Walter Toman (Toman, 1959). Sibling position is the birth order of those in the sibling subsystem, including the prescribed roles associated with birth position. A classic example of sibling position is the tendency of the first child or the eldest, to be the “leader” or “in charge” (Bowen, 1985). Bowen aimed to expand upon this work by suggesting that siblings can take on roles beyond what is stereotypical for their sibling position. Building on the previously mentioned example, if the eldest sibling in a two-sibling dyad has a disability, she may be the functional younger sibling while the younger sibling takes on more leadership roles, and thus, is the functional older sibling. Bowen was also interested in the transmission of sibling roles to subsequent generations, which sibling position(s) are most vulnerable to triangulation, and encouraging differentiation
by helping others think beyond the prescribed traits of their sibling position (Brown, 1999).

As previously mentioned, there is limited empirical support for the tenants of BFST. A review of the empirical research on BFST conducted by Miller, Anderson, & Keala, (2004) revealed that, overall, there are very few studies that utilize BFST. Some research on sibling position, intergenerational transmission, and family projection process is available, but it does not examine the concept with a BFST lens or within the context of therapy. The previously mentioned research on differentiation does show some support for the topic, but research does not support Bowen’s assumption that people partner with someone who has a similar level of differentiation. Lastly, there are no known empirical studies that examine the overall effectiveness of BFST.

**Bowen Applications to Siblings**

The use of BFST to study siblings can support the conceptualization of the sibling subsystem within its context without neglecting important sibling dyad variables (i.e., dyad structure), and individual-level variables (i.e., depression); a current critique of the sibling literature. The tenant of BFST, sibling position, can help researchers that study siblings hypothesize how the structure of the sibling dyad may affect SRQ. Bowen discussed 11 sibling positions in his work, including variations based on gender composition and twins (Brown, 1999). Sibling position may also help researchers understand how two siblings in the same family can be different from each other and experience their FOO differently. A family that is poorly differentiated may also promote
siblings that have a rigid adherence to or completely reject the prescribed role of their position (Bowen, 1974).

Bowen family systems theory can describe the mutual influence between the sibling subsystem and FOO. For example, conscious and unconscious rules governing the FOO affects the way siblings related to each other and other members of the family system. These rules may include prescriptions for family distance regulation (e.g., children can go away to college but they must move close to home after graduation, we don’t share negative emotions in our family). Distance regulation within the sibling subsystem and FOO may also impact the development of SRQ over the lifespan, thereby influencing individual-level outcomes. Ferriby (2015) found that FOO processes were related to distance regulation in the sibling subsystem for female/male dyads. Specifically, she discovered that the brother’s separateness/autonomy was associated with the younger sister’s perception of warmth in the relationship.

The concept of triangles can help conceptualize how other family members, particularly parents, may become involved in sibling conflict. When there are high levels of tension in the sibling dyad, siblings may triangulate a parent to diffuse the tension. Interlocking triangles in the family can occur and encourage sibling rivalry if one sibling perceives that the parents favor the other sibling. Lastly, a sibling can be easily triangulated with parents if she recognizes parental conflict and attempts to manage her parents’ emotional distance. Bowen did not explicitly say how triangulation could impact the development of SRQ, but Ponappa, Bartle-Haring, Holowacz, & Ferriby (2017) found that when a sibling was triangulated in parent-child conflict, the belief that the parents
gave him or her preferential treatment increased. This increased perception of preferential treatment was negatively associated with perceptions of warmth in the sibling relationship.

**Sibling relationships in the family context**

Bowen Family Systems theory suggests that the sibling relationship develops within the larger family system and thus, there is a reciprocal and bidirectional influence on the characteristics of the family system and its subsystems (Bowen, 1986; Milevsky, 2013). An overall positive family environment is linked to better SRQ (Lussier, Deater-Deckard, Dunn & Davies, 2002). Children living in high-conflict homes are more likely to have an aggressive and hostile relationship with their siblings, although some contradictory research shows that there can also be a compensatory relationship, where siblings grow closer (Milevsky, 2005). There is evidence that demonstrates how the sibling relationship adapts to the FOO’s context, like living in a disadvantaged neighborhood or gender role expectations in the family (e.g., Brody et al., 2003; McHale, Crouter, & Tucker, 1999; Nuckolls, 1993, McHale, Whiteman, Kim, & Crouter, 2007).

The influence of parental subsystem on SRQ is also bidirectional. Authoritative and Permissive parenting styles are associated with higher sibling support when compared to authoritarian and neglectful parenting styles (Milevsky, 2005). Closer and less conflictual sibling relationships are related to high levels of maternal and paternal responsiveness and the ability of parents to effectively manage a child with a difficult temperament (Brody, Stoneman, & Gauger, 1996; Derkman et al., 2011). Furthermore, parental differential treatment of siblings is related to more adverse outcomes for the
sibling that perceives herself as less favored and poorer SRQ, unless siblings interpret that differential treatment as fair (i.e., sibling with a disability or chronic illness; Kowal & Kramer, 1997). Also, siblings’ perceived parental marital satisfaction is a significant predictor of higher SRQ (Milevsky 2004). In contrast, when fathers report less marital satisfaction over time, siblings have closer and less conflictual relationships, which may indicate a potential compensatory function of SRQ (Kim et al., 2006).

**Limitations**

There are many critiques of BFST. Betty Carter and Monica McGoldrick included issues in diversity in BFST and added a developmental component to the theory in their interpretations of BFST in the late 80’s and early 90’s (e.g., Carter & McGoldrick, 1988). Still, some concepts of BFST are not well defined within the literature. For example, the concept of anxiety is critical to the understanding of BFST. It would be incorrect to interpret anxiety using a diagnostic definition; anxiety, used by Bowen, is also inclusive of stress, trauma, and other psychopathology. As previously stated, differentiation is an abstract and philosophically complex concept. One consequence of this BFST limitation is the lack of valid and reliable measurement. This study attempts to address this gap by using the more concrete, general, and widely understood concept of distance regulation. Using distance regulation will allow processes of closeness and separateness to be studied a new way within the sibling and couple relationship. As stated previously, the empirical research on BFST is limited, and applications of BFST to siblings even more so. But, BFST may be useful when interpreting findings from the current body of sibling literature. Examples of this are discussed later in the chapter.
The Study of Siblings

Scholars believe components of the sibling relationship that differentiate it from other intimate relationships, including a shared environment and genetics, give siblings the opportunity to be highly influential on each other (Caspi, 2010; McHale et al., 2012) and despite the decreasing size of U.S families, the majority of children will have at least one sibling (Milevsky, 2013). Furthermore, children in the U.S. spend more time with their siblings than any other person, and it is likely that the sibling relationship will be the longest and most resilient relationship in one’s life when compared to parental, spousal, and peer relationships (McHale & Crouter, 1996; Sanders, 2004). Indeed, research shows that beyond parent, peer, and genetic influence, siblings continue to have a strong influence on each other’s behaviors (Feinberg, Solmeyer, & McHale, 2012). Lastly, in their longitudinal study, Waldinger & colleagues (2007) found that sibling relationship quality is one of the more robust predictors of mental health diagnosis, including major depression, up to 30 years later in life.

Historically, the research on siblings has focused on variables like sibling position and other structural aspects of the dyad (i.e., gender composition; Feinberg, Solmeyer, McHale, 2012). The oldest sibling literature examines the effect of sibling position (i.e., birth order, oldest, youngest) on individual outcomes (i.e., IQ; Milevsky, 2013). Structural components of the sibling dyad, including age difference, sex composition, and genetic relatedness, are still of interest to contemporary scholars that study siblings to determine how in these variables impact the development of sibling relationship qualities (i.e., warmth, conflict). Indeed, research shows that positive associations between sibling
behaviors (e.g., delinquency; Slomkowski et al., 2001) are the strongest when members of the dyad are more similar (Feinberg, Solmeyer, McHale, 2012).

In the 1980’s, researchers shifted their focus to sibling relationship process variables (i.e., influence, relationship quality) and their impact on individual developmental trajectories (Howe & Recchia, 2014). Qualities of the sibling relationship, like warmth and support, can be a strong predictor of many positive outcomes across the lifespan, including positive intimate relationships and peer acceptance (Feinberg, et al., 2012; Updegraff, McHale, & Crouter, 2000), greater feelings of self-worth (Stocker, 1994), and social skills (Pike, Coldwell, & Dunn, 2005). Furthermore, a supportive and warm sibling relationship may be protective for children experiencing adverse life events, bullying, or negative parenting practices (Bank, Burraston, & Snyder, 2004; Noland, Liller, McDermott, Coulter, & Seraphine, 2004).

Limitations

To advance the sibling literature, researchers studying the sibling relationship need to address the current methodological challenges. First, as mentioned previously, researchers should utilize a systemic, ecologically-based theoretical framework to study siblings. Learning theories, like SLT, conceptualizes sibling influence as linear, behavior-centered, and focused on transmission from older sibling to younger sibling (Feinberg et al., 2012). Theoretical frameworks, like BFST, can be employed in the study of siblings to address these limitations.

Next, scholars should define what constitutes a “sibling study.” The current body of sibling research includes effects of sibling position and other structural variables on
individual outcomes, using monozygotic twins (and even more recently, full siblings) within a research design to control for genetic influence, the presence or absence of a sibling (i.e., singlets), and more recently, sibling process variables like interaction and influence (McHale et al., 2014; Feinberg et al., 2012; Whiteman et al., 2011). Frequently, conclusions about these processes within the sibling relationship are made based on a pre-determined dyad with little consideration of other siblings in the subsystem (McHale et al., 2014). This study attempts to address these limitations by collecting data on all siblings of the participant to explore possible common characteristics of the sibling selected as most influential.

Last, the operational definition of siblings should be further clarified. Within the scholarly literature, the operational definition of siblings has traditionally been very strict and only inclusive of people who share the same biological parents (Cicirelli, 1991). Current estimates suggest that less than half of all children in the U.S. currently reside with both biological, still-married parents, who are in their first marriage (Wang & Parker, 2014). Researchers argue that the societal shift from traditional to different family structures will lead to a greater reliance on the sibling system as support for families across the lifespan (Van Volkom, 2006). Despite these statements, families that include non-biologically related siblings (i.e., step, half, other) are often not represented, or intentionally excluded, in research. Researchers that study siblings should aim to have a more inclusive definition of a sibling, and capture level of genetic relatedness variables to control them in their analysis or examine group differences in outcomes. The current
study aims to address this critique by adopting an inclusive definition of siblings and assessing structural variables of the sibling dyad.

**Sibling Relationship Quality**

Sibling relationship quality is a construct comprised of bidirectional and reciprocal warmth, closeness, conflict, and rivalry between siblings. Generally, empirical explorations of SRQ was negative in nature and focused on aggression, antisocial, negative health, rivalry, and conflict outcomes, with positive SRQ defined as the absence of these negative characteristics (Feinberg et al., 2012). In this study, positive SRQ is defined as higher levels warmth and support and low levels of conflict, and negative SRQ is classified by high levels of conflict and low levels of warmth (Dunn, Brown, & McGuire, 1995). Currently, the most popular measures of SRQ are a summation of positive and negative sibling qualities. The most commonly cited measures of sibling relationship quality are The Sibling Relationship Questionnaire (SRQ; Furman & Buhrmester, 1985, The Sibling Relationship Inventory (SRI; Stocker & McHale, 1992), The Sibling Inventory of Behavior (SIB; Volling & Blandon, 2005), and 4) the Parental Expectations and Perceptions of Children’s Sibling Relationships Questionnaire (PEPC- SRQ; Kramer & Baron, 1995).

**Influence of SRQ on individual developmental outcomes**

**Younger Siblings.** Early in the lifespan, positive SRQ is associated with intrapersonal protective factors for each member of the sibling dyad including the development of morality, better psychological adjustment (Dunn, Brown, & Maguire, 1995; Gass et al., 2007), and higher levels of self-esteem (Brody, 2004). Sibling warmth
is also positively associated with peer competence (Kim et al., 2006), is negatively associated with externalizing behavior problems in intellectually disabled children (Floyd, et al., 2009), and is a moderator of childhood stress (Gass et al., 2007). Also, researchers found that poor SRQ between young siblings was predictive of major depressive disorder and use of psychoactive drugs at age 50 (Waldinger et al., 2007).

Additionally, feelings of sibling support are associated with lower levels of externalizing behaviors (Milevsky, 2003). Samek and Reuter (2011) found that the more warmth and closeness younger siblings reported feeling toward an older sibling, the less likely they were to use substances three years later. This effect was not moderated by older sibling substance use, suggesting independent protective effects of positive SRQ. Younger siblings in affect-intense sibling relationships, characterized by high levels of warmth and high levels of conflict, may generalize this pattern of interaction to other relationships, which may lead to decreased ability to manage negative emotions, poor communication skills, and more challenges developing peer relationships (Feinberg et al., 2012).

**Older Siblings.** For adolescent and young adult siblings, negative SRQ is a risk factor for delinquent behaviors (Slomkowski et al., 2001), and development of problem behaviors later in life (Gass et al., 2007). Sibling aggression is predictive of antisocial behaviors and substance misuse, after controlling for peer norms and parental effects (Feinberg et al., 2012). Older sibling substance use patterns and attitudes are highly correlated with the attitudes and behaviors of their younger siblings (Caspi, 2010). Sibling researchers have found that siblings that exhibit increased conflict have a ten-time
greater risk of being depressed than those that do not, even after controlling for parent and peer effects (McHale et al., 2012).

Like younger siblings, affect-intense SRQ may be predictive of negative outcomes for adolescent and young adults. Researchers theorize that affect-intense SRQ may create the ideal environment for the older sibling to act as a gatekeeper for negative behaviors (McHale & Crouter, 2006) and engage in “sibling deviancy training,” wherein close siblings are “partners in crime” and participate negative behaviors together (McHale, Updegraff, & Whiteman, 2012). The similarity in sibling substance use, risky sex, and delinquent behaviors are greater in siblings with affect-intense SRQ (McHale et al., 2014).

Despite this finding, current scholars that study SRQ advocate that warmth and conflict are not opposite characteristics on the same continuum, but separate dimensions of SRQ. Furthermore, researchers suggest the emotional intensity of sibling relationships, often described as extreme love-hate, is an important developmental experience and ‘healthy’ sibling relationships contain levels of warmth, support, and conflict (Brody, 2004). In fact, researchers that conducted a retrospective qualitative interview of adults found that increases in sibling conflict post-parental divorce were inconsequential for the individuals and their SRQ (Bush, 2003).

To date, research on how sibling relationships change across the lifespan is mixed. Longitudinal research has shown that sibling relationship patterns may change around seven years old and fluctuate through early adulthood when SRQ appears to remain steady throughout the rest of the lifespan. These patterns also vary based on
structural variables of the dyad; mixed sex dyads become increasingly closer during adolescence, and same-sex siblings have a high level of intimacy in early adolescence and then exhibit small declines through middle and late adolescence (Kim et al. 2006). Findings also show sibling intimacy may increase before and after older siblings move out of the family home (Whiteman, McHale, & Crouter 2011). Overall, the researchers suggest that SRQ is stable over time, with positive relationships in childhood predicting positive relationships in adolescence and adulthood (Gass, Jenkins, & Dunn, 2007).

**Limitations**

As previously mentioned, there is some discrepancy between sibling researchers on the operational definition of SRQ. Previously, SRQ has been measured by an absence of conflict indicating higher levels of SRQ (Katz et al., 1992). Now, researchers suggest that like other intimate relationships, it is not the absence of conflict, but the ability to manage conflict that contributes to a positive SRQ (Carstensen, Gottman, & Levenson, 1995; Kramer, 2010). Future measurement efforts may consider facets of SRQ, like conflict and warmth, as separate dimensions and assess SRQ at different times across the lifespan. This study aims to address this issue by utilizing The Lifespan Sibling Relationship Scale (LSRS; Riggio, 2000) to measure dimensions of the sibling relationship in both childhood and adulthood and by applying the concept of distance regulation to the sibling relationship to assess levels of closeness and separateness.

Research on the fluctuation of sibling closeness across the lifespan has yielded mixed results, particularly for adolescent siblings (Sanders, 2004). These mixed results may be partially explained by the lack of longitudinal research in the sibling literature.
Kim and colleagues (2006) conducted a longitudinal analysis that showed there was no significant change for same-sex siblings and decreases for mixed-sex dyads in intimacy levels from early childhood through adolescence. This gap in the research may be due to the lack of theoretical frameworks that incorporate a lifespan developmental perspective. In future studies, it will be important to replicate these longitudinal findings and to examine variations based on family-level variables (i.e., race, ethnicity, and structure).

Solmeyer, McHale, and Crouter (2014) found that sibling conflict was a risk factor for females, but not for males, with the participation of some health-risk behaviors. This difference may be explained by gender socialization that encourages “rough play” in boys and more passive-aggressive fighting in females (McHale, Updegraff, Helms-Erikson, & Crouter, 2001), thus reliability of measurement of the constructs of SRQ, like gender bias for the construct of conflict, should be further examined. This task may be especially important for understanding the circumstances in which higher SRQ has a positive (i.e., buffering effect) or negative (i.e., delinquency training) impact for siblings. This study will examine differences in the sibling relationship quality and sibling distance regulation based on individual level demographic characteristics and dyadic level sibling structural variables.

Last, sibling scholars have just begun to explore how sibling relationships may influence romantic relationships. Many qualities of sibling and romantic relationships overlap such as companionship, intense display of emotions, power, and control. The sibling relationship may be the initial context where skills are developed to manage these relational issues (i.e., negotiating conflict; Doughty, McHale, & Feinberg, 2015). Thus, it
is possible that emotional distance regulation in sibling relationships mirrors romantic relationships, but more evidence is needed. This study aims to contribute to this area of the sibling literature.

**Clinical Implications**

Despite the current foundation of research that shows that the sibling bond can affect cognitive, emotional, moral, health, and social domains, there are almost no interventions designed specifically for the sibling relationship (Feinberg, et al., 2012). Family systems and BFST are theories commonly employed by Marriage and Family Therapists, but there is no known literature to date on the intentional inclusion of siblings in family therapy. Additionally, researchers that study siblings rarely include clinical implications in their published manuscripts.

The use of siblings in treatment has been advocated for in clinical literature for decades. For example, Bryant and Litman (1987) suggest that sibling therapy may be a positive alternative for families where one or both parents are physically distant, physically absent, mentally or physically ill, or the parent had a deep conflict with a child. Furthermore, developmental tasks like conflict resolution and social skills may be easily learned within the sibling subsystem as opposed to the parent-child subsystem due to a more egalitarian power and authority hierarchy within the sibling relationship. Positive communication and behavioral skills may not be modeled in the child's’ home by the parent but could be promoted and practiced with the sibling group in therapy. This dissertation addresses this gap by detailing the clinical implications of the results of the current study in Chapter 5.
**Purpose Statement and Goals**

Therefore, the purpose of this study was to: 1) investigate whether the relationship between sibling structural variables (i.e., age difference, gender composition) and the sibling relationship in the current sample aligns with the consensus amongst scholars that study siblings; 2) examine individual’s perceptions of the sibling relationships and the connection with interpersonal (i.e., relationship satisfaction) and intrapersonal (i.e., mental health) factors; and 3) explore the congruence of sibling and romantic relationship distance regulation. Results from this study will be used build evidence on the importance of SRQ on individual outcomes across the lifespan and promote the intentional inclusion of siblings in current clinical family therapy practice and treatment.

**Research Questions and Hypothesis**

To investigate the aforementioned objectives, the following hypothesis and research questions guided the current study. Based on previous research, it was expected that:

H₁: Within the selected sibling dyads, the closest siblings will be same-sex dyads, with sisters being the closest.

H₂: Within the selected sibling dyads, siblings that are <= 2.5 years of age will have a closer relationship than siblings that have an age gap > 2.5 years.

H₃: Perceptions of the sibling relationship in childhood are related to perceptions of the sibling relationship in adulthood.

H₄: Sibling relationship quality in childhood and adulthood are predictive of intrapersonal (i.e., depression) and interpersonal factors (i.e., relationship satisfaction).
To investigate the relationship between SRQ, sibling distance regulation, couple distance regulation, and inter/intrapersonal factors, a conceptual model was tested using SEM to explore the following research questions:

R₁: Are there common characteristics of the “influential sibling” for participants that have more than one sibling?

R₂: What is the relationship between sibling distance regulation and couple distance regulation?

R₃: To what extent does couple distance regulation and sibling distance regulation mediate the relationship between SRQ and inter/intrapersonal factors?
Chapter 3: Methodology

The overall objectives of this study were to: 1) investigate whether the relationship between sibling structural variables (i.e., age difference, gender composition) and the sibling relationship in the current sample aligns with the consensus amongst scholars that study siblings; 2) examine individual’s perceptions of the sibling relationships and the connection with interpersonal (i.e., relationship satisfaction) and intrapersonal (i.e., mental health) factors; and 3) explore the congruence of sibling and romantic relationship distance regulation.

To test these objectives, several questionnaires were used to investigate participants’ relationship with a close sibling. If applicable, participants received questionnaires that measure distance regulation and satisfaction within a romantic relationship. The current chapter describes the characteristics of the participants, details the data collection procedures, and presents the questionnaires used to capture the dependent and independent variables.

Data Collection Procedures

This study, including recruitment methods, measures, was determined to be “exempt” by the Institutional Review Board (IRB # 2017E0046; Appendix A). Individuals that participated in the project met the following inclusion criteria: 1) they are over 18; 2) can read and speak English; and 3) had at least one sibling growing up. Participants were not required to be in a romantic relationship so if they indicated that they are not in a romantic relationship, they skipped the questions measuring couple
distance regulation within the survey. The sample was obtained through Research listservs, like ResearchMatch© and StudySearch. ResearchMatch© is an online registry designed to bring together researchers and potential participants for research studies. At the time of data collection, 134 institutions (e.g., research-focused universities), 50 partner organizations (e.g., Alzheimer’s Association), and 110,000 potential participants use ResearchMatch©. Of the volunteers on ResearchMatch©, 70.8% are female, 28.9% are male, and .3% are transgender. Volunteers reside in all 50 states across the U.S., with Ohio having the densest population of volunteers (~13,500) followed by Tennessee (~8,400) and California (~8,200). Lastly, 37.5% of volunteers report no current medical diagnosis, but 10.6% of report depression, 7.8% report hypertension, and other diagnoses like asthma, anxiety, migraines, allergies, and ADHD (ResearchMatch©.org/metrics). Through the recruitment process of this study, 13,403 potential participants were randomly selected and emailed for interest, 893 of those indicated they would like more information and 320 refused to participate. Of those who expressed interest, 554 of those consented to participate in the survey.

A power analysis using RMSEA (Preacher & Coffman, 2006) was used to determine the number of participants needed to detect significant effects within the sample and decrease the probability of a Type II error. The power analysis revealed that a minimum of 92 participants required to complete the intended analysis using SEM ($\alpha=.05$, $d=.8$).

After participants had indicated their interest in the study through ResearchMatch© and StudySearch, research personnel of the current study received their
contact information. Then, those potential participants received an IRB approved email that described the purpose of the study, the inclusion criteria, and an anonymous link to complete the survey through the Qualtrics survey platform (Appendix A). When participants followed the link, they were directed to a consent form. Participants had to agree to participate in the survey before they were permitted to answer any survey questions. The participants completed all survey questions at one-time. If participants decided to take a break, they could return to their survey and their saved responses of the same link, browser and IP address were used. The average duration of the survey was 145.54 minutes ($SD=765.67$, range: 4.0-8328.58). Participants taking a break from the survey may explain the large standard deviation and range. At the end of the survey, a thank-you message appeared that includes the PI’s contact information for any additional questions. Within Qualtrics, 589 surveys were initiated, and most the sample ($n=455$) completed over 90% of the questions. All data from the on-line surveys were downloaded and stored in SPSS files and were fully de-identified for analysis.

**Instrumentation**

All participants were administered the same surveys in the same order. If participants indicated they were not currently in a romantic relationship, a skip-pattern embedded in Qualtrics would bypass all surveys related to the romantic relationship.

**Demographics**

Participants completed questions about their individual demographic information (i.e., age, ethnicity, race, marital status) and questions about their sibling relationship, including their level of genetic relatedness (i.e., twin, step) and sibling position (i.e.,
Participants also answered retrospective questions to assess sibling structural variables earlier in life (e.g., “How many years did you live with this sibling in the same household?”). The sibling structural variables collected as sibling demographics were used to explore hypothesis related to sibling closeness and research questions about common characteristics of the chosen sibling. Current research demonstrates that siblings are most influential if they are closest in age and the current average age difference between siblings in the U.S. is 2.5 years, so that number was used as the established cut-point to test hypothesis 2 (Martinez, Daniels, & Chandra, 2012; Whiteman, McHale, & Soli, 2011). Cronbach’s alpha and descriptive statistics for each scale can be found in Table 2 and Table 3, respectively.

**Exogenous Variables**

**Child and Adult Sibling Relationship.** The Lifespan Sibling Relationship Scale (LSRS; Riggio, 2000) was used to gather data on the current state of the participant’s sibling relationship and their perception of the same relationship in childhood. If the participant has more than one sibling, he or she was instructed to select the sibling that had the greatest impact on his or her life to focus on when answering the survey questions. The LSRS is a 48-item self-report scale that measures three dimensions of the sibling relationship in childhood and adulthood: affection toward the sibling, behavior toward the sibling, and beliefs about the sibling/sibling relationship. This scale was chosen for the study because it is the only known sibling relationship scale that measures perceptions of both the adult and childhood sibling relationship. Responses to all questions on the LSRS are Likert-style and range from 1 (strongly disagree) to 5.
(strongly agree). The sum of items 1-24 measure the adult sibling relationship, 25-48 measure the childhood sibling relationship, and all individual items reflect overall satisfaction and attitude toward the sibling relationship. The LSRS has demonstrated internal reliability for the overall scale ($\alpha = .96$) and subscales ($\alpha = .84-.91$). Riggio (2000) also reported a test-retest reliability of .91, and discriminant validity with measures of psychological well-being and social support.

A Principal Component Analysis (PCA) was used to examine items grouped together to form the three subscales the author originally intended. The Kaiser-Meyer-Olkin value was above .6 and Bartlett’s Test of Sphericity was significant, but the individual items intended for three separate subscales were not distinguishable. All items loaded on the first factor, with only eight loading on factor two and three items on factor three. Therefore, the adult sibling relationship subscale was treated as a singular observed variable. Correlations and the scale-item deleted procedure were used to determine the strongest items to comprise the scale. Eleven items were selected resulting in a final alpha of .97. The same process was repeated for the child sibling relationship subscale. Correlations and reliability statistics for the created child sibling relationship scale were compared against the statistics for selecting the corresponding items from the adult sibling relationship subscale. The corresponding questions had a stronger alpha, thus those 11 questions were selected to create the child sibling relationship scale ($\alpha = .90$). This process required the sibling relationship variables to be altered in the model accordingly (Figure 2), but did not affect the initial theoretical conceptualization.
Endogenous Variables

**Intrapersonal Factor: Depression.** The Patient Health Questionnaire (PHQ-9), was used to measure the observed outcome variable of depression. This measure includes nine questions about depressive symptoms such as whether the participant has “little interest or pleasure in doing things” or is “feeling down, depressed, or hopeless.” To assess the severity of the depressive symptoms, participants indicated their answers to these questions on a 4-point Likert scale: not at all, several days, more than half the days, and nearly every day. Responses receive a 0, 1, 2, or 3 score, and the overall depression score is the sum of these individual item’s scores with higher scores indicating more depressive symptoms. The reliability measures range from .86-.89 (Kroenke, Spitzer, & Williams, 2001).

**Intrapersonal Factor: General Perception of Health.** To measure general perceptions of health, three items were selected from The Healthy Living Questionnaire, commonly known as the SF-8 (Quality Metric). The SF-8 is a short-form version of the SF-36, one of the most used health status surveys in the U.S., with each question providing a subjective assessment for one of eight global health domains. Each item has a five-or-six-point response range, a four-week recall period, and is appropriate to use with adults over 18 years old (Turner-Bowker, Bayliss, Ware, & Kosinski, 2003). For the purposes of this study, items measuring an intrapersonal perspective of health were selected. Three items were selected, including, “Overall, how would you rate your health during the past 4 weeks?” (Overall perception of health; item 1), “During the past 4 weeks, how much did physical health problems limit your physical activities (such as
walking or climbing stairs)?” (Physical Health; item 2), and, “During the past 4 weeks, how much have you been bothered by emotional problems (such as feeling anxious, depressed or irritable)?” (Emotional Health; item 7). Other items measuring social and occupational roles were determined to have interpersonal facets, and thus, did not meet the definition of intrapersonal factors, and were dropped. Cronbach’s Alpha for the created scale confirmed the reliability of the measurement ($\alpha = .72$).

**Interpersonal Factor: Relationship Satisfaction.** Relationship satisfaction was measured on a 10-point scale with “1” indicating not at all satisfied and “10” indicating completely satisfied. This single item has been used in previous studies and is highly correlated with the Kansas Marital Satisfaction Scale, a commonly used measure of relationship satisfaction (Crane, Middleton, & Bean, 2000).

**Mediating Variables**

**Couple Distance Regulation** was assessed with two scales: selected items from the Social Connectedness Scale-Revised (SCS-R; Lee, Draper & Lee, 2001) and the healthy separation subscale of the Separation-Individuation Test of Adolescence (SITA; Levine, Green & Millon, 1986). Both scales have been reworded to reflect a dyadic relationship between the couple members. Sample items from the SCS-R include “I feel distant from my partner” and “My partner is able to relate to me.” Sample items from the SITA healthy separation subscale include: “I feel I can be myself, with my partner,” and “If my partner disagrees with something I am doing, he/she usually feels free to say so.” The revision of the SCS-R includes nine items, and the SITA healthy separation subscale includes five items to assess levels of, “togetherness” and “separateness,” respectively.
The participants answer the 14 items with respect to themselves and their partner, totaling 28 items. These revised scales have been used in recent research (e.g., Hartwell, 2013) and reported reliability for the connectedness scale for adult participants was .82, the reliability for the separateness scale was .72 (Bartle-Haring, Younkin, & Day, 2012).

**Sibling Distance Regulation.** To compare distance regulation between the sibling relationship and intimate romantic couple relationship, and to decrease rater bias, the The Social Connectedness Scale-Revised (SCS-R; Lee, Draper & Lee, 2001) and the Separation-Individuation Test of Adolescence (SITA; Levine, Green & Millon, 1986) questionnaires were adapted to measure sibling distance regulation. Sample items from the SCS-R include “I feel distant from my *sibling*” and sample items from the SITA healthy separation subscale include: “I feel I can be myself, with my *sibling*,” and “If my *sibling* disagrees with something I am doing, he/she usually feels free to say so.”

Reliability of measurement was assessed for both Couple and Sibling Distance Regulation as latent constructs. The SITA and SCSR were considered separate for both constructs, based on the systemic theoretical framework and recommendations from the literature (Bartle-Haring, 1997; Gavazzi, 1993). The SITA and SCSR were also separated to distinguish the perspective that was measured. For example, items one through five for the SITA couple measured the participants assessment of the relationship (Indicated with the suffix added to the variable name “I2CPL”). Items six through 10 measured the participants perceptions of their partner on the same items (indicated with the suffix added to the variable name “CPL2ME”). Therefore, four subscales comprised each
construct of couple and sibling distance regulation. The scale alphas, descriptive
statistics, and the number of items are indicated in Table 2 and Table 3.

Analytic Plan

Preliminary Analysis

A cross-sectional descriptive design was used to explore the quantitative survey
items. Descriptive statistics for demographic variables and all questionnaires were
summarized, and categorical variables with small sample sizes were collapsed.
Descriptive statistics for continuous variables included means, standard deviations, and
ranges and counts and percentages for categorical variables. Pearson’s R statistic was
used to determine congruence of sibling and romantic relationship distance regulation.
All analyses were done using SPSS Statistics, except the SEM, which was completed in
SPSS AMOS.

Missing Data

SPSS will perform the many of the intended analysis with missing data by using
the deleted cases list wise procedure. Missing data were analyzed using the missing data
analysis procedure in SPSS. If less than three percent of items were missing within an
observed measure, the data were replaced with individual mean substitution. This
approach is advantageous because the participants’ responses on the given measure are
used to estimate the missing item(s) (Widaman, 2006).

As mentioned previously, participants were not excluded from the study if they
were not in a couple relationship and all responses for the couple relationship measures
were coded as missing. The full sample (N=476) was used in all analysis, apart from the
SEM analysis. Participants that indicated they were not currently in a relationship ($n=131$) did not complete the couple relationship measures. Therefore, their data were not appropriate to include in the model because conclusions could not be made about the mediating role of couple distance regulation and the congruence between couple and sibling distance regulation. The sample size for the SEM analysis was $n=338$.

**Structural Equation Model**

Structural equation modeling was used to model the complex relationships between the variables. Structural equation modeling was the ideal analytic approach for many reasons. First, observed variables were used to create latent variables that represented more abstract concepts in the conceptual model (i.e., couple distance regulation). The conceptual model was used to examine multiple relationships between variables, simultaneously. Next, SEM is an appropriate analytic technique to use with dependent data, and thus, may correct some of the bias in the data incurred through non-probability sampling procedures. After adjustments were made to the sibling variables in the conceptual model, there are now 13 observed and two latent variables in the updated model (Figure 2) including two observed exogenous variables “Childhood Sibling Relationship” and “Adult Sibling Relationship,” and three observed endogenous variables that measure inter/intrapersonal factors: depression, relationship satisfaction, and Perceptions of Health. The latent variables “Couple Distance Regulation” and “Sibling Distance Regulation” were added to the model for the mediation analysis. Both latent variables that measure distance regulation are comprised of the same four observed
variables measuring two perspectives (i.e., SITA12SIB, SITASIB2ME) that were adapted to measure the romantic or sibling relationship.

To construct the model, Pearson’s R correlations were conducted to examine the relationship between all latent and observed variables. The relationships between the observed variables that comprise latent variables were tested for reliability using Chronbach’s alpha to develop the measurement scales. Then, an initial confirmatory factor analysis, or “mini” measurement model, was constructed to examine the factor loadings of the observed variables on the couple and sibling distance regulation latent variables. All factor loadings were strong, significant, and in the correct direction. Only the subsample was used in the development and initial tests of the measurement scales.

After constructing the models for factor analysis, the direct effects model was developed to examine the impact of the child and adult sibling relationship on inter/intrapersonal endogenous variables (Figure 3). To test for mediation, sibling and couple distance regulation was added to create the full model. To estimate indirect effects of the mediating variables, syntax was written for user-defined estimands within AMOS. Model fit was determined using the following three guidelines: 1) Normed Fit Index (NFI) > .95 (Schumacker & Lomax, 2004); 2) Goodness of Fit Index (CFI) >.93 (Byrne, 1994); and 3) Root mean square error of approximation (RMSEA) > .05 (Stieger, 1990). The chi-square statistic was also used to evaluate model fit, but previous research shows that chi-square statistic with sample sizes of approximately 400 and a model with correlations between variables typically produce significant chi square values and thus,
should not be the single determinant of overall model fit. Results from model
development and fit are discussed in Chapter 4.
Chapter 4: Results

In this chapter, means, standard deviations, and correlations of the study variables are presented first. Then, the results section is organized by each hypothesis, including the analysis of the SEM Model.

**Demographic variables**

Within the full sample (N=475), there were 119 males (25.0%) and 356 females (74.8). Most the sample identified as white (87.8%) than non-white (12.0%). As previously mentioned, 338 (72.1%) participants indicated that they were currently in a romantic relationship, and thus answered the couple specific questions, while 131 participants indicated they were not currently in a relationship (27.9%). All descriptive statistics for the demographic variables of the sample are in Table 4. Descriptive statistics for the demographic variables of the subsample used for the SEM model are in Table 5. Finally, descriptive statistics for the structural variables of the sibling dyad are in Table 6.

Hypothesis 1: Within the selected sibling dyads, the “closest” siblings will be same-sex dyads, with sisters being the closest.

A one-way ANOVA compared the four sibling dyad structures of sisters, brothers, and mixed (participant is male or participant is female) using the average score of four subscales that measured closeness in the sibling relationship. There was a significant difference between groups on the adult sibling relationship subscales of the LSRS ($F(3, 458)= 7.87, p<.001$), and the and SCSR for siblings ($F(3, 458)=5.38, p=.001$). The child sibling relationship was not significant ($F(3, 458)=.68, p=.536$). The
closest sibling pairs were sisters, and mixed dyads where the participant selected a female/sister as their most influential sibling were second closest.

**Hypothesis 2:** Within the selected sibling dyads, siblings that are \( \leq 2.5 \) years of age will have a closer relationship than siblings that have an age gap > 2.5 years.

Independent t-tests were calculated to examine the influence of age difference on sibling closeness within the selected dyad. The absolute value of the age difference between siblings was calculated. A cut-point of 2.5 years was established to create two groups, \( \leq 2.5 \) years apart \((n=148)\) and > 2.5 years apart \((n=298)\). Sibling closeness was measured with the same four scales and subscales in hypothesis 3. Results of the t-test indicated that based on age group, only the child sibling relationship subscale had significant differences \((t(444)= 2.09, p=.037)\), with siblings \( \leq 2.5 \) years in age indicating greater closeness \((M=3.36, SD=.98)\) than siblings > 2.5 years apart in age \((M=3.17, SD=.93)\). The adult sibling relationship subscale \((t(444)= 1.05, p=.294)\), total LSRS \((t(444)= 1.778, p=.076)\), and SCSR for siblings \((t(444)= 1.61, p=.109)\), indicated no significant differences in closeness. Correlations using age difference as a continuous variable and sibling closeness can be found in Table 7.

A two-way ANOVA was used to examine the interaction of gender composition and age group on sibling closeness. Results showed that brothers tended to be closer when they were > 2.5 years apart, whereas all other gender compositions tended to be less close (Figure 4).

**Hypothesis 3:** Perceptions of the sibling relationship in childhood are related to perceptions of the sibling relationship in adulthood.
Pearson’s correlation indicated a significant relationship between perceptions of the sibling relationship in childhood and adulthood ($r(338)=.45, p<.001$). Correlations for all model variables are in Table 8.

**Hypothesis 4:** *Sibling relationship quality in childhood and adulthood are predictive of intrapersonal (i.e., depression) and interpersonal factors (i.e., couple relationship satisfaction).*

The relationship between the sibling relationship and inter/intrapersonal factors was examined using the direct effects SEM model (Figure 3). Results of this model demonstrated that the adult sibling relationship was not significantly related any of the inter/intrapersonal outcome variables. The child sibling relationship was also not significantly related to general perceptions of health, but was significant related to depression ($\beta=-.14, p<.05$) and relationship satisfaction with a current romantic partner ($\beta=.21, p<.001$). In other words, more positive perceptions of the childhood sibling relationship were predictive of decreased depressive symptoms and increased couple relationship satisfaction. The overall fit of the direct effects model was inadequate ($X^2(2) = 17.42 (p<.001); \text{NFI=.923; CFI=.929; RMSEA=.151}$).

**Research Question 1:** *Are their common characteristics of the “influential sibling” for participants that have more than one sibling?*

Descriptive statistics for the chosen sibling and comparison to other members of the sibling variables can be found in Table 9. Crosstabs and chi-square statistics were calculated to examine any associations between structural variables of the dyad. There was a significant association between gender of the participant and gender of the
indicated sibling ($\chi^2(4) = 9.95, p=.04$). Male participants chose male siblings ($n=59$) slightly more often than female siblings ($n=52$) and female participants chose a female sibling ($n=209$) more often than male siblings ($n=142$). There was a significant association between genetic relatedness and living in the same home ($\chi^2 (1) = 7.25, p<.01$). Full siblings lived in the same house ($n=380$) more often than they did not ($n=9$). Similarly, siblings that were not fully related also lived in the same house ($n=50$) more often than they did not ($n=5$).

There was a significant association between gender composition of the dyad and number of siblings in the overall subsystem ($\chi^2(2) = 10.29, p<.01$). Brothers and mixed gender pairs were more often the only members of their sibling subsystem ($n=95$) than a triad subsystem ($n=67$) or a subsystem with more than three siblings ($n=87$). Sisters were more often from sibling subsystems with more than three members ($n=98$), than dyads ($n=52$) or triads ($n=58$). Last, there was a significant association between genetic relatedness and an age difference $> \text{or} \leq 2.5$ years. Full biological siblings were more often $> 2.5$ years apart ($n=252$), then $\leq 2.5$ years ($n=136$). The same pattern held true for not fully related siblings more often being $> 2.5$ years apart ($n=43$) than not ($n=11$).

There were not significant interactions for many of the sibling structural variables, including sibling position in the dyad of the participant and gender of the significant siblings, genetic relatedness and gender of the significant sibling, genetic relatedness and gender composition of the dyad, and gender composition and $> \text{or} \leq 2.5$ years apart in age.
Research Question 2: What is the relationship between sibling distance regulation and couple distance regulation?

To explore the relationship between the sibling and couple distance regulation, Pearson’s R was used to correlate scale and subscale average totals. The SCSR total average for couples was not significantly correlated with the sibling SCSR ($r(338)=.08, p=.15$) or sibling SITA ($r(338)=.08, p=.159$). The SITA total average for couples was significantly correlated with the sibling SITA ($r(338)=.18, p=.001$) and the sibling SCSR ($r(338)=.18, p=.001$). A full table of correlations, including the results of correlations between the different perspectives (i.e., I2SIB, I2CPL), can be found in Table 7.

Research Questions 3: To what extent does couple distance regulation and sibling distance regulation mediate the relationship between SRQ and inter/intrapersonal factors?

The latent constructs of couple distance regulation and sibling distance regulation, including disturbance variables were inserted into the direct effects model as mediating variables (Figure 3). All indirect paths were added to the model. Both the observed adult and child relationship exogenous variables had paths to the couple and sibling distance regulation variables and those variables had paths to the three outcome variables. Error terms were added to all endogenous variables.

The initial model was run in AMOS with only the theorized paths. Initial model fit was inadequate ($\chi^2(53) = 522.34$; NFI=824; CFI=.837; RMSEA=.164), but modification indices provided by AMOS suggested correlating the error terms for the two perspectives within the SITA and SCSR for both couple and sibling distance regulation.
Modification indices suggested that the correlated error between general perceptions of health and depression would also improve the model fit. Finally, insignificant direct paths were removed from the model. Final measures of model fit suggest that the conceptual model had a strong fit with the data ($\chi^2(56)= 76.41 \ (p=.036); \ NFI=.974; \ CFI=.993; \ RMSEA=.033$). Full results of the model are in Figure 5. Mediation and partial mediation of paths were evident after both distance regulation constructs were added to the model. The path between the child sibling relationship and depression was fully mediated and was no longer significant in the full model ($\beta=-.07, \ p=.155$). The path between the child sibling relationship and couple relationship satisfaction was partially mediated, evidenced by the decrease in the beta coefficient and statistical significance ($\beta=.10, \ p<.05$).

To determine the significance of indirect paths, the user defined estimands and bootstrapping procedures were used. Results of this analysis revealed three significant indirect paths. Each indirect path originated with the child sibling relationship, went to the couple distance regulation variable, and then each endogenous variable, general perceptions of health ($\beta=.04, \ p<.05$), depression ($\beta =-.02, \ p<.05$), and couple relationship satisfaction ($\beta=.29, \ p<.05$).
Chapter 5: Discussion

This chapter begins with a discussion of the results exploring the selected sibling and structural variables of the dyad. Next, the discussion of the results in Chapter 3 are organized in the current chapter by the three objectives of the study. Then, the strengths, limitations, and directions for future research are provided. Last, the chapter concludes with implications for clinical practice.

**Common Characteristics of the selected sibling**

Basic descriptive statistics of the selected sibling indicated that participants picked siblings that lived in the same household with them growing up (97%) more often than not (3%). It is possible that siblings who live in the same household have the opportunity to spend more time together, and thus, have more opportunity to develop their relationship. Indeed, the literature shows that siblings in the U.S. spend more time with each other than other members of the family (Feinberg et al., 2012). It is worth noting that the majority of siblings selected as most influential were full siblings (85.9%), and it seems likely that siblings who have the same biological parents would reside in the same house. So, it may be that living in the same house is not a common characteristic of an influential sibling, but a result of being full siblings.

Participants also selected a female sibling (56%) more often than a male sibling (44%), regardless of their own biological sex. Additionally, Cross-tabs and chi-square analysis revealed a significant association between gender composition of the dyad and number of siblings in the subsystem, where brothers and mixed siblings were more often
the only members of their sibling subsystem and sisters were more often from larger siblings subsystems. Together, these findings may suggest that when participants had more than one sibling to choose from, they chose a sister. Future research on siblings should consider allowing participants to select their sibling instead of randomly selecting a member of the subsystem to further understand what type of sibling is considered most influential. This research may be strengthened by the inclusion of qualitative items to support the understanding of why and how a sibling is influential.

Objective 1: To investigate whether the relationship between sibling structural variables (i.e., age difference, gender composition) and the sibling relationship in the current sample aligns with the consensus amongst scholars that study siblings.

The results of independent t-tests partially confirmed the hypothesis that same-sex dyads would be the closest, with sisters being the closest sibling dyad, but brothers were the least close of the dyads. After sisters, participants that identified as male and selected a female as their most influential siblings were the second closest of the sibling dyads. This result related to closeness could reflect the amount of perceived warmth in the sibling relationship. Milevsky (2005) reported that siblings who specified a sister as the most important sibling reported more warmth in the relationship, despite the overall sex composition of the sibling subsystem, than those siblings that specified a brother as the most important. So, the opportunity for participants to select a sibling, particularly one that is most influential, could help explain these results.

Results of the independent t-tests comparing sibling closeness between those that were > or <= 2.5 years apart in age yielded significant results on the child sibling
relationship. The other three scales, adult sibling relationship, total LSRS score, and SCSR for siblings did not confirm the hypothesis that siblings \( \leq 2.5 \) years apart would be closer. Research on age difference and SRQ is mixed. Some research suggests that siblings closer in age are more likely to have increased levels of contact, to function as playmates in childhood, and share friends (Feinberg et al., 2012), resulting in increased levels of closeness. Other researchers found that siblings closer in age are more likely to engage in competition for resources and attention from parents, which may lead to increased levels of rivalry and lower levels of warmth (Milevsky, 2011). Lastly, some researchers believe SRQ is not a function of age difference (McHale et al., 2013). It may be that the relationship between age difference and SRQ is more evident at specific points in the lifespan. For example, siblings may actively de-identify from each other while exploring their identity during late adolescence (McHale et al., 2011). The mean age of the sample was 45.38 (SD=15.53), so it is possible that many of the participants were past these developmental experiences that could cause age difference to affect levels of closeness.

Interestingly, a two-way ANOVA examining both age difference and gender composition of the sibling dyad showed that brothers tended to be closer when they were \( > 2.5 \) years apart, whereas all other gender compositions tended to be less close (Figure 4). A wider age gap between siblings may decrease competition for resources, like parental attention, which may lead to decreased conflict between siblings (Kolak & Volling, 2013). In fact, Tucker and colleagues (2001) determined that siblings’ reactive aggression in certain situations is more likely between close-aged siblings. Furthermore,
socialization of gender roles for young boys in the U.S. often includes characteristics like aggression and more physical play when compared to females. Increases in aggression and fighting, including sibling violence, are associated with negative individual outcomes across the lifespan and lower SRQ (Whiteman et al., 2011). Thus, a greater age space between brothers may decrease the competition and conflict that may lead to physical altercations, resulting in higher levels of SRQ, could explain this finding in the current study.

**Objective 2:** To examine individuals’ perceptions of their sibling relationships and the connection with interpersonal (i.e., couple relationship satisfaction) and intrapersonal (i.e., depression) factors.

Correlations between the adult and sibling relationship were significant as expected, but the correlation coefficient suggests that relationship is only moderately strong ($r(338)=.42, p<.001$; Aron et al., 2011; Jackson, 2006). The literature on sibling relationships suggests closeness may change across the lifespan, and this change varies depending on the structural composition (e.g., gender composition) of the dyad, but the nature of the relationship (i.e., positive or negative) tends to remain consistent (Feinberg et al., 2012). However, this research is limited in that it rarely focuses on the development of the sibling relationship in adulthood and old age (McHale et al., 2012).

In the current study, the mean age of the sample was 45.38 ($SD=15.53$, range: 18.0-75.0). It is possible that the instructions to answer the sibling relationship questions about the “most influential sibling, positive or negative” could alter the results in comparison to other more traditional methods of researchers selecting a sibling dyad (e.g., closest in age). A sibling that is indicated as influential may be due to a change in
the relationship from childhood to adulthood, like a significant event that brought siblings dramatically closer, like a compensatory effect, or trauma to the relationship that damaged the sibling bond. Researchers the study siblings could consider specific analytic techniques, like intra-class correlations, to explore the stability of the sibling relationship at different points across the lifespan.

The direct effects model explored the influence of the sibling relationship on general perceptions of health, depression, and romantic relationship satisfaction. The paths from child sibling relationship to depression and romantic relationship satisfaction were the only significant paths of this model. Although there were significant correlations between the adult sibling relationship and the outcomes depression and general perceptions of health, they did not hold in the direct or mediated model. Thus, these results suggest the importance of the childhood sibling relationship. Scholars that study siblings suggest that the sibling relationship may be one of the first contexts to practice prosocial skills, like conflict management, and compromise (Sherman, Lansford, & Volling, 2006). These skills affect the ability to form interpersonal relationships and are related to the development of interpersonal factors, like depression (Vujeva & Furman, 2011). It is possible that these prosocial strategies are developed early in the lifespan, and then extrapolated to other significant interpersonal relationships later in life. Researchers studying the influence of SRQ on individual developmental outcomes should take the opportunity to assess the childhood sibling relationship, in addition to the present-day relationship, to gain an understanding about how the relationship may change over the
Objective 3: To explore the congruence of sibling and romantic relationship distance regulation.

The average score of the SITA for couples was significantly correlated with both the SCSR and SITA for siblings, indicating levels of healthy separation in the couple relationship was associated with closeness and healthy separation in the sibling relationship. The couple SCSR was not associated with either the SITA or SCSR for siblings (See Table 7). It is possible that this lack of significance reflects aspects of closeness within the couple relationship, like physical/sexual intimacy, that are not present in the sibling relationship. Further research using distance regulation as a construct to compare sibling and romantic relationships could include measurements that are more specific to the characteristics and behaviors in each relationship to gain more clarity on these results.

The full SEM model was used to examine the relationship between sibling and couple distance regulation further. Results of the mediation model showed distance regulation of the couple was a more significant mediator of the paths between the sibling relationship and the outcome variables. Specifically, there were significant indirect effects of the child sibling relationship, through couple distance regulation, to all three outcome variables. Evidence in the sibling literature suggests that interaction between siblings, including those that are conflictual, enhance social skills by allowing siblings to practice negotiating, emotional expression, and problem-solving (Bedford, Volling, & Avioli, 2000). Additionally, researchers have found a connection between conflict
resolution styles within the romantic and sibling relationship (Reese-Weber & Kahn, 2005). These findings suggest the importance of assessing the childhood sibling relationship in future research on SRQ and inter/intrapersonal factors.

**Strengths and Limitations**

The inclusion of the sibling relationship across two points of the lifespan was a strength of this study. To study the influence of the sibling relationship on romantic relationships, capturing the qualities of the sibling relationship in childhood was important based on the development of interpersonal skills and the sibling influence on that development is more likely to occur early on in life (Howe & Recchia, 2014). (Doughty, Lam, Stanik, & McHale, 2015). The assessment of the sibling relationship in childhood and adulthood also presented limitations. The LSRS required participants to answer questions retrospectively about their sibling relationship. Retrospective perspectives are subject to bias for many reasons, like difficulty of recall, acquired meaning making of memories, and the current mood of the participant (Hardt & Rutter, 2004).

Additionally, participants were not instructed to recall a specific developmental period or age as a reference point for the “child” and “adult” sibling relationship. Some participants may have reported current characteristics of their adult sibling relationship whereas other participants, particularly much older participants, may have referenced a specific point in their adult life, which could affect the data in many ways. Younger participants may have a greater ability to recall their childhood sibling relationship, simply because it was more recent than participants who were older in age. In fact, the
LSRS normative group had a mean age of 23 years, although the author of the measured reported that age did not significantly influence the scores (Riggio, 2000). A longitudinal study that assesses the sibling relationship at multiple points across the lifespan will be an important research effort to clarify this issue.

Survey methods used in this study were a convenient means of gathering data, but not without some drawbacks. Volunteer bias may be evident in the sample, as those who participated in the study needed to willingly sign up for ResearchMatch© and agree to participate in this study without incentive. Social desirability bias may have affected to the participant's survey responses, particularly about negative feelings within familial relationships (Krumpal, 2013). Lastly, the survey methods are subject to measurement error, particularly misunderstanding of questions (Krumpal, 2013). Indeed, some participants reached out to research personnel with comments about the repetitive nature of the multiple perspective questions. Rewording items to provide more variety for participants or reorganizing questions within the survey so the similarity of items is less evident may help to decrease these challenges for participants.

The use of online survey methodology facilitated the recruitment of approximately 400 more participants than required to complete the intended analysis with a fully powered sample. A limitation of this recruitment method is that the sample is not nationally representative, and thus, the results of this study are not generalizable. The homogeneity of the participant sample of the current study limited the ability to examine contextual variables, like race and socioeconomic status (SES). The cross-sectional design of the study also limits the ability to draw conclusions about causal relationships
from the result. Although the conceptual model had a strong fit with the data, more research is needed to determine the causal links and directionality of the individual paths.

Another limitation of the current study is the lack of data on the role of the parents. Bowen Family Systems Theory suggests that parents play a significant role in the development of SRQ and the current sibling literature confirms this. Specifically, parental differential treatment, a concept studied in the literature but is beyond the scope of this dissertation, affects the formation of the sibling relationship (Milevsky et al., 2011). Individuals within the sibling dyad that perceive differential treatment, particularly that a parent favors the other sibling, report less warmth within the sibling relationship (Milevsky, 2013). In addition, researchers have shown that parental intervention in adolescent sibling conflict is related to lower levels of sibling relationship quality (Kramer, 2010; Siddiqui & Ross, 2004). The current study may not be capturing other important family-level, and co-parent processes that could affect the results.

**Directions for Future Research**

Results of this study emphasize the importance of the child sibling relationship on romantic relationship factors, including overall romantic relationship satisfaction. Recent research suggests that mixed-gender sibling dyads may play a greater role in romantic relationship competence than same-gender dyads over time (Doughty, McCale, & Feinberg, 2015). Future research that examines the congruence of the sibling and romantic relationship should also consider differences in this influence using structural variables of the sibling relationship.
The current study used the concept of distance regulation to gather the perspective of the participant and the perception of their partner and sibling’s perspective on similar items. This research could be improved by including the sibling and romantic partner as participants in the study, allowing researchers to capture accurate perceptions of the other members of the sibling and relationship subsystems. From a BFST viewpoint, multiple perspectives allow for greater understanding of the dynamic and relational aspects of the sibling relationship and the greater family system, like mutual influence and bi-directionality (Bartle-Haring, McWey, & Durtschi, 2014; Cicirelli, 2013; Milevsky, 2013). This effort will be particularly important to further the understanding of the development of the sibling relationship in the familial context.

Examining the sibling relationship in varying familial, cultural, and community contexts is an important direction for future research. Research shows that the individualistic nature of Western cultures may cultivate more rivalry between siblings than collectivistic cultures. Updegraff and colleagues (2005) showed that Mexican-American siblings spend more time with each other than European American siblings. Future research efforts could include testing the current conceptual model and comparing fit indices across siblings in different racial and ethnic groups.

Additionally, there is a need for the study of diverse family structures and their specific strengths and challenges, including siblings and step-siblings that reside in single parent and blended family homes (Tillman, 2008). A study by Overlock (2017) revealed that there was less rivalry between siblings in one-parent households when compared to two-parent households. Other research suggests that siblings may grow closer because of
the shared experience of parental divorce (Roth et al., 2014). Research focused on how half, adopted, and step-siblings influence each other may be an important area of research that could inform current interventions designed to support families in transition (i.e., divorcing and blending families). Utilizing a mixed methods approach to facilitate the interpretation of SRQ measures could be particularly important for understanding the circumstances in which higher SRQ has a positive (e.g., buffering effect) or negative (e.g., delinquency training) impact within diverse families.

This study builds upon current sibling research by examining structural components of the full sibling subsystem and exploring common characteristics of the sibling that was chosen as most influential. This research has been limited by collecting data on SRQ for only one dyad. Blended and minority families are more likely to have more than two children in the sibling subsystem (McHale, Updegraff, & Whiteman, 2014). In sibling subsystems with more than two members, the first and third born may be more similar than the first and second born. The youngest sibling in a triad is more likely the compare herself to the middle sibling rather than the oldest, which may lead to decreased rivalry and competition between the first and third born (Van Volkom, Machiz, & Reich, 2011). This could be explained by the decreased need to differentiate herself from the oldest sibling and less competition for resources, like parental attention, and may have important implications for research on sibling relationships with high levels of warmth and conflict – a risk factor for sibling participation in health risk behaviors, like substance use (Slomkowski et al., 2011).
Finally, this current study used the intrapersonal factors of general perception of health and depression and the interpersonal factor of couple relationship satisfaction as the outcome variables, but the current sibling literature suggests that the sibling relationship can influence other individual outcomes that may be worth exploring. Current research demonstrates the SRQ has an impact on other intrapersonal factors, like increased cognitive abilities (Feinberg et al., 2012). Sibling relationships may also affect other indicators of interpersonal relationship satisfaction. For example, research on sibling and romantic relationships failed to uncover a link between the two until relationship length was added as an interaction variable (Doughty, Lam, Stanik, & McHale, 2015). Studying sibling relationship influence on different indicators of romantic relationship quality and satisfaction will be an important future research endeavor to forward the literature in this area. It is also possible that these inter/intrapersonal factors may be more salient in a clinical population. Thus future research efforts should attempt to replicate this study within a clinical population.

**Implications for Clinical Practice**

Despite the current foundation of research that shows that the sibling bond can affect cognitive, emotional, moral, health, and social domains, there are almost no clinical interventions designed specifically to enhance the sibling relationship (Feinberg, et al., 2012). Clinicians should consider utilizing the sibling subsystem as a built-in support system and strength of the greater family system. Below the following clinical applications for early intervention with young siblings, adult siblings, and adults in romantic relationships are discussed.
**Early intervention with young siblings.** The results of this study indicating the importance of the sibling relationship in childhood emphasizes the need for early intervention to repair a broken bond or strengthen a weak bond between young siblings. This may be especially important for young brothers, because of their tendency to have higher levels of the negative aspects of SRQ, like conflict and rivalry (Whiteman, McHale, & Soli, 2011). Therapy with siblings may be a positive alternative for families where one or both parents are physically distant, physically absent, mentally or physically ill, or the parent had a deep conflict with a child. Furthermore, developmental tasks like conflict resolution and social skills may be easily learned within the sibling subsystem as opposed to the parent-child subsystem, due to a more egalitarian power and authority hierarchy. Positive communication and behavioral skills that may not be modeled in the child's’ home by the parent could be promoted and practiced with the sibling group in therapy. It is possible this intervention could lead to more satisfying relationships later in life and prevent the transmission of negative family patterns to the subsequent generations.

**Interventions with adults.** Clinicians using BFST can use the concept of distance regulation and the sibling relationship in their clinical work. Marriage and Family Therapists, and other clinicians that regularly collect FOO information as a part of their clinical work, may regularly gather a detailed relationship history between the client and her parents and the relationship between the parents. Clinicians may not consider collecting extensive details on the relationship or significance of the relationships between the client and her sibling(s). The clinician can collect information about
influential structural variables for each sibling, including gender, genetic relatedness, and age difference to contextualize the sibling relationships. Then, clinicians can collect information on closeness within the sibling relationships. If the relationships are positive in nature, they may be an important model of a positive relationship in the client’s life, especially if the relationship with parents was not positive. A clinician and client can discuss how the strengths of the sibling relationship could be adapted and modeled within other significant relationships in the client’s life.

The sibling relationship may be useful in conceptualizing intrapersonal factors, like depression, within the family system. Additionally, a sibling may be an important resource for social support for the client to relieve feelings of isolation related to their depression. A sibling may be invited into family therapy to work with the client to uncover and corroborate the intergenerational transmission of family dysfunction (i.e., maladaptive family rules, abuse, and neglect). This process can prompt insight into the client’s role within her family system, which could lead to an increased ability to effectively regulate physical and emotional distance with others. Lastly, the sibling system may be used to practice new communication skills, like perspective taking, within the therapeutic context. After strengthening these skills within the safety of the sibling relationship in therapy, the client may be better prepared to apply them in other relational contexts.

*Adults in romantic relationships.* Finally, the results of the current study could inform clinicians’ practices with romantic couples. After gathering a detailed relationship history of the client’s sibling relationships, clinicians can ask specific questions about
healthy levels of closeness and separateness to see how they relate to the same facets of the current couple relationship. This may be particularly important for clients who could use their sibling relationship as a healthy model for distance regulation. There could be a therapeutic discussion with the couple about how aspects of the sibling relationship related to distance regulation, like retaining autonomy within a shared identity, are managed within that relational context. Any insight gained about that process can be applied to the couple context to alleviate emotional reactivity and conflict.

**Conclusion**

As family structures in the U.S. continue to change, siblings, whether biologically related or not, are an important part of families. Researchers argue that the shift from traditional to different family structures will lead to a greater reliance on the sibling system as a focus of clinical intervention and in research (Van Volkom, 2006). Despite the previously discussed limitations, this study contributes to the current body of sibling literature. First, this study demonstrates the utility of capturing information on the entire sibling subsystem as opposed to randomly selecting a sibling to create a dyad. Next, this study is one of the first to use BFST and distance regulation to study the congruence of the sibling and couple relationship. The current study is the only study known to use the concept of distance regulation as a mediating variable between the sibling relationships and inter/intrapersonal outcomes to date. The results of this model, including the indirect effects, encourage future researchers that study siblings to use a lifespan perspective when studying the sibling relationship. Finally, the current study contributes to MFT
literature by using the BFST theoretical framework to conceptualize the results of the study and provide recommendations for future research and clinical practice.
References


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Turner-Bowker, D. M., Bayliss, M. S., Ware, J. E., & Kosinski, M. (2003). Usefulness of the SF8™ Health Survey for comparing the impact of migraine and other conditions. Quality of Life Research, 12(8), 1003-1012.


Appendix A: Data Collection Documents
IRB Exemption Approval

01/19/2017

Study Number: 2017E0046
Study Title: Sibling Dynamics and Inter/Intrapersonal Well-being

Principal investigator: Suzanne Haring
Date of determination: 01/19/2017
Qualifying exempt category: #2

Dear Suzanne Haring,

The Office of Responsible Research Practices has determined the above referenced project exempt from IRB review.

Please note the following about this determination:

- Retain a copy of this correspondence for your records.
- Only the Ohio State staff and students named on the application are approved as Ohio State investigators and/or key personnel for this study.
- Simple changes to personnel that do not require changes to materials can be submitted for review and approval through Buck-IIRB.
- No other changes may be made to exempt research (e.g., to recruitment procedures, advertisements, instruments, protocol, etc.). If changes are needed, a new application for exemption must be submitted for review and approval prior to implementing the changes.
- Records relating to the research (including signed consent forms) must be retained and available for audit for at least 5 years after the study is closed. For more information, see university policies, Institutional Data and Research Data.
- It is the responsibility of the investigators to promptly report events that may represent unanticipated problems involving risks to subjects or others.

This determination is issued under The Ohio State University’s OHHS Federalwide Assurance #00006378. Human research protection program policies, procedures, and guidance can be found on the OHRP website.

Please feel free to contact the Office of Responsible Research Practices with any questions or concerns.

Jacob Stoddard
stoddard13@osu.edu
(614) 292-0526
Hello!

Thank you very much for your interest in our study, we appreciate your time and consideration. We are seeking volunteers for a new study that will examine the influence of family relationships on specific indicators of well-being, including mental and physical health, and current intimate relationships. Please verify that you meet the following criteria-

- You are between 18 and 75 years old.
- You had at least one sibling growing up. This sibling may be a full, half, step, cousin, or adopted sibling.
- You can read English

For the purposes of our study, we need you complete a set of questionnaires about family relationships on specific indicators of well-being, including mental and physical health, and current intimate relationships. This survey will take place online. There are no incentives for participation in this survey.

If you believe you fit the criteria for the study and would like to participate please click the link below.

[https://osu.az1.qualtrics.com/SE/?SID=SV_5uTuJNkYrGAn7KZ](https://osu.az1.qualtrics.com/SE/?SID=SV_5uTuJNkYrGAn7KZ)

If you have any questions or concerns, please feel free to contact Elizabeth Palmer indicating your concern and the best way to contact you. [Email: Palmer.344@osu.edu](mailto:Palmer.344@osu.edu)

If you know someone that fits the criteria for this study and might be interested in participating, please have them contact us. Thank you again for your time and consideration.
Measures

Q1 Dear participant, Thank you for agreeing to participate in our research study about sibling relationship dynamics and perceptions of well-being. The purpose of this study is to explore the potential influence of siblings on specific indicators of well-being, including mental and physical health, and current intimate relationships. The data collected from the online surveys will be aggregated and analyzed to gain a better understand how varying sibling dynamics in childhood and adulthood may be related to one’s perceptions of their own well-being and feelings of closeness toward a romantic partner. To participate, you should be between the ages of 18 and 75 and have at least one sibling that you grew up with. For the purposes of this study, a sibling can be related to you in any way (full, half, step, cousin adopted, etc.) and lived in the same home as you the majority of the days of the week growing up. If you are not currently in a romantic relationship, you are still eligible to participate in this study. Please follow the instructions as you go through the survey and answer the questions by selecting the appropriate response. When you reach the question that asks if you currently are in a romantic relationship, indicate yes or no. If you indicate that you are not currently in a romantic relationship, you will not be asked any questions about romantic relationships. If for any reason you don't wish to answer a question, just skip that one and go on to the next. We understand that you may experience discomfort when reporting on your family relationships and health (i.e., levels of conflict, depression). The measurements used are for research purposes only and are not intended to screen for potential mental health problems or diagnosis. If you experience discomfort during this study, we encourage you to reach out to your primary care provider or therapist. If you need more information please review websites the Center for Disease Control’s website for mental health (https://www.cdc.gov/mentalhealth/) or contact the PI of this study. Our hope is that the information gathered through this study might help researchers and clinicians devise interventions utilizing the sibling relationship. Once we have your responses, we will erase your identifying information from our files and your data will be de-identified. All reports about this survey will be in aggregate form, no family or individual will be identified. We will work to make sure no one sees your online responses without approval. But, because we are using the Internet, there is a chance that someone could access your online responses without permission. Since that means they could have access to your IP address or e-mail address, this information could be used to identify you. We thank you in advance for completing this survey. It should take you no more than 60 minutes to complete. For questions or if you feel you have been harmed as a result of study participation, please feel free to contact the principal investigator, Suzanne Bartle-Haring, Ph.D. (haring.19@osu.edu) at 688-3259. She will be glad to speak with you about the survey or what may be making you uncomfortable about completing it. Your participation is completely voluntary. You can withdraw from the study at
any time simply by closing your browser. Your decision to participate or not will in no way impact your relationship
with The Ohio State University. If you have questions or concerns about your rights as a participant in this study or to
discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact
Ms Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251.

Please select an option below.

- Yes, I consent to participate in this study (1)
- No, I decline to participate (2)

If No, I decline to participate Is Selected, Then Skip To End of Survey

Q3 What is your age (in years)?

Q4 What is your gender?

- Male (1)
- Female (2)
- Other (3)

Display This Question:
If What is your gender? Other Is Selected

Q5 If you selected other, please define.

Q6 How do you identify your sexual orientation?

- Heterosexual (1)
- Homosexual (2)
- Bisexual (3)
- Other (4)

Display This Question:
If How do you identify your sexual orientation? Other Is Selected

Q134 If you selected other, please define.

Q7 How do you identify your race/ethnicity (select all that apply)?

- Caucasian (1)
- Black/African-American (2)
- Asian or Asian American (3)
- Native Hawaiian or Pacific Islander (4)
- Native American or Alaskan (5)
- Hispanic/Latino/Latina (6)
Q9 What religion or spiritual beliefs do you identify with?

Q10 Select your highest degree earned:
- less than high school (1)
- High school graduate (2)
- GED (3)
- Some College (4)
- Professional Certificate (5)
- Associates Degree (6)
- Bachelors Degree (7)
- Masters Degree (8)
- Professional Degree (9)
- PhD, MD, or JD (10)

Q11 How many hours per week do you currently work?
- less than 10 hours (1)
- 10 to 20 hours (2)
- 31 - 25 hours (3)
- 35-40 hours (4)
- more than 40 hours (5)

Q135 How many days per week do you currently work?
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)

Q12 What is your occupation?

Q13 What is your annual income in dollars per year of your household (Including all adult members)?
Q14 What is your current relationship status (please select all that apply)?

- single (1)
- dating (2)
- partnered (3)
- cohabitating (4)
- married (first marriage) (5)
- separated (6)
- remarried (7)
- divorced (8)
- widowed (9)

Q15 What is your current relationship length? Please indicate if the number entered is the number of months or years for your current relationship. If single, indicate n/a.

Q16 How many children do you have? (if you do not have children, please insert "0")

Display This Question:
If How many children do you have? (please do not include stepchildren, if you do not have children,... Text Response Is Greater Than 0

Q138 Please answer the following information about your children

<table>
<thead>
<tr>
<th>Child 1 (1)</th>
<th>How old is your child?</th>
<th>Does this child currently live in your home the majority of the days of the week?</th>
<th>What is your biological relationship with this child?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Please indicate if the number represents years of age or months of age. For example, 6 years or 6 months (1)</td>
<td>Yes (1)</td>
<td>No (2)</td>
</tr>
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<td></td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Child 2 (2)</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Child 3 (3)</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Child 4 (4)</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Child 5 (5)</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Child 6 (6)</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Child 7 (7)</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Child 8 (8)</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Child 9 (9)</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
</tbody>
</table>
Q138 How many adults currently live in your home, including yourself (people over 18 years of age)?

Q22 Over the last 2 weeks, how often have you been bothered by any of the following problems?

<table>
<thead>
<tr>
<th>Little interest or pleasure in doing things (1)</th>
<th>Not at all (1)</th>
<th>Several Days (2)</th>
<th>More than half the days (3)</th>
<th>Nearly every day (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeling down, depressed, or hopeless (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trouble falling or staying asleep, or sleeping too much (3)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Feeling tired or having little energy (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor appetite or overeating (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeling bad about yourself- or that you are a failure or have let yourself or your family down (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trouble concentrating on things, such as reading the newspaper or watching television (7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moving or speaking so slowly that other people noticed. Or, the opposite- being so fidgety or restless that you have been moving around a lot more than usual. (8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thoughts that you would be better off dead or hurting yourself in some way (9)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q23 Overall, how would you rate your health during the past 4 weeks?

- Excellent (1)
- Very Good (2)
- Good (3)
- Fair (4)
- Poor (5)
- Very Poor (6)

Q24 During the past 4 weeks, how much did physical health problems limit your usual physical activities (such as walking or climbing stairs)?

- Not at all (1)
- Very little (2)
- Somewhat (3)
- Quite a lot (4)
- I could not do any physical activities (5)

Q25 During the past 4 weeks, how much difficulty did you have doing your daily work, both at home and away from home, because of your physical health?

- None at all (1)
- A little bit (2)
- Some (3)
- Quite a lot (4)
- Could not do daily work (5)

Q26 How much bodily pain have you had during the past 4 weeks?

- None (1)
- Very Mild (2)
- Mild (3)
- Moderate (4)
- Severe (5)
- Very Severe (6)

Q27 During the past 4 weeks, how much energy did you have?

- Very Much (1)
- Quite a lot (2)
- Some (3)
- A little (4)
- None (5)
Q28 During the past 4 weeks, how much did your physical health or emotional problems limit your usual social activities with family or friends (such as feeling anxious, depressed, or irritable)?

- Not at all (1)
- Very little (2)
- Somewhat (3)
- Quite a lot (4)
- I could not do social activities (5)

Q29 During the past 4 weeks, how much did personal or emotional problems keep you from doing your usual work, school or other daily activities?

- Not at all (1)
- Very little (2)
- Somewhat (3)
- Quite a lot (4)
- Could not do daily activities (5)

Q36 Please list the following information about yourself and your sibling group. Please list only those that you consider to be a sibling currently. This sibling may be a full, half step, cousin, or adopted sibling. How many siblings do you have?

Q37 For each of your siblings, please provide the following information. The number of rows with information (bold number on the far left in the table) should match the number of siblings you indicated in the previous question for number of siblings (i.e., if you indicated that you had 4 siblings in the previous question, you should fill out 4 rows in the table below). Please do not include information about yourself in this table.

<table>
<thead>
<tr>
<th>Sibling Position</th>
<th>Sibling's Gender</th>
<th>Your level of genetic relatedness to that sibling</th>
<th>Did you live in the same house as this sibling growing up?</th>
<th>How long did you live in the same house?</th>
<th>Please indicate any significant mental or physical health challenges your sibling has coped with.</th>
<th>Sibling's Age</th>
<th>If you indicated a diagnosis, please enter the approximate age of your sibling at the time of their diagnosis.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(oldest, middle, 4th, youngest)</td>
<td>Male (1)</td>
<td>Female (2)</td>
<td>Other (3)</td>
<td>Twin, half, full, step, adopted,</td>
<td>Yes (1)</td>
<td>No (2)</td>
<td>Please respond in years (1)</td>
</tr>
</tbody>
</table>
Q41 Looking at the table above, please indicate the row number (bold, black number in the far left column, 1 - 9) of the sibling that has had the greatest impact on your life, either positively or negatively.

1 (1)
2 (2)
3 (3)
4 (4)
5 (5)
6 (6)
7 (7)
8 (8)
9 (9)

Q38 Please answer the following information about yourself.

<table>
<thead>
<tr>
<th>Your Sibling Position</th>
<th>Please indicate any significant mental or physical health challenges you have coped with.</th>
<th>If you indicated a diagnosis, please enter your age at the time of the diagnosis.</th>
</tr>
</thead>
<tbody>
<tr>
<td>You (1)</td>
<td>depression, learning disability, autism, ADHD, cancer, etc (1)</td>
<td>Please respond in years (1)</td>
</tr>
<tr>
<td>oldest, middle, 4th, youngest etc (1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q42 Besides the siblings already indicated, who else lived in your household with you growing up? (Please check all that apply)

- Mother (1)
- Father (2)
- Grandmother (3)
- Grandfather (4)
- Aunt (5)
- Uncle (6)
- Cousin (7)
- Other (8)

Display This Question:
If Besides the siblings already indicated, who else lived in your household with you growing up? (Pl... Other Is Selected
Q42 You selected "Other" for the previous question "Who else lived in your household with you growing up". Please indicate your relationship with this person below.

Q43 Who served as your primary caregiver growing up (select all that apply)?

- Mother (1)
- Father (2)
- Both Mother and Father (3)
- Grandparent (4)
- Foster Parent (5)
- Sibling (6)
- Aunt/Uncle (7)
- Legal Guardian (8)
- Other (9)

Display This Question:
If Who served as your primary caregiver growing up? Other Is Selected
Q44 You selected "Other" for the previous question "Who served as your primary caregiver growing up"? Please indicate your relationship with this person below.

Q45 The following questions concern your relationship with one of your siblings. This sibling may be a full, half, step, or adopted sibling, as long as you have lived in the same household for most of your childhood. If you have more than one sibling, please select the sibling you indicated in the previous question who has had the GREATEST IMPACT on your life, either POSITIVELY OR NEGATIVELY. If you only have one sibling, answer the following questions about
your relationship with him/her. Please answer the questions that ask about siblings in this survey thinking only of that specific sibling and your relationship with him or her.

Q46 As a reminder, the row number of the sibling indicated is below: $\{q://QID45/ChoiceGroup/SelectedChoices\}$

Q47 For this this section of the survey, you will need to answer questions about yourself, your selected sibling, and your relationship with that selected sibling.

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree (1)</th>
<th>Disagree (2)</th>
<th>Neither agree nor disagree (3)</th>
<th>Agree (4)</th>
<th>Strongly agree (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My sibling makes me happy. (1)</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>My sibling’s feelings are very important to me. (2)</td>
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<tr>
<td>I enjoy my relationship with my sibling. (3)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>I am proud of my sibling. (4)</td>
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<tr>
<td>My sibling and I have a lot of fun together. (5)</td>
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<tr>
<td>My sibling frequently makes me very angry. (6)</td>
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<tr>
<td>I admire my sibling. (7)</td>
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<tr>
<td>I like to spend time with my sibling. (8)</td>
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<tr>
<td>I presently spend a lot of time with my sibling. (9)</td>
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<tr>
<td>I call my sibling on the phone frequently. (10)</td>
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<tr>
<td>My sibling and I share secrets. (11)</td>
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<tr>
<td>My sibling and I do a lot of things together. (12)</td>
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<tr>
<td>I never talk about my problems, with my sibling. (13)</td>
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<tr>
<td>My sibling and I borrow things from each other. (14)</td>
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<tr>
<td>My sibling and I “hang out” together. (15)</td>
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<tr>
<td>My sibling talks to me about personal problems. (16)</td>
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<tr>
<td>My sibling is a good friend. (17)</td>
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<tr>
<td>My sibling is very important in my life. (18)</td>
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<tr>
<td>My sibling and I are not very close. (19)</td>
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</tr>
<tr>
<td>Possible Statement</td>
<td>Yes</td>
<td>No</td>
<td>Maybe</td>
<td>Unknown</td>
<td>Don't Know</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>My sibling is one of my best friends.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My sibling and I have a lot common.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I believe I am very important to my sibling.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I know that I am one of my sibling’s best friends.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My sibling is proud of me.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My sibling bothered me a lot when we were children.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I remember loving my sibling very much when I was a child.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My sibling made me miserable when we were children.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I was frequently angry at my sibling when we were children.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I was proud of my sibling when I was a child.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I enjoyed spending time with my sibling as a child.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I remember feeling very close to my sibling when we were children.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I remember having a lot of fun with my sibling when we were children.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My sibling and I often had the same friends as children.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My sibling and I shared secrets as children.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My sibling and I often helped each other as children.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My sibling looked after me (or I looked after my sibling) when we were children.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My sibling and I often played together as children.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My sibling and I did not spend a lot of time together when we were children.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My sibling and I spend time together after school as children.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I talked to my sibling about my problems when we were children.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
Q54 Please answer the following questions about the sibling you selected.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree (1)</th>
<th>Generally Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Generally Disagree (4)</th>
<th>Strongly Disagree (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My sibling and I were ‘buddies’ as children. (41)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>My sibling did not like to play with me when we were children. (42)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>My sibling and I were very close when we were children. (43)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>My sibling and I were important to each other when we were children (44)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>My sibling had an important and positive effect on my childhood. (45)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>My sibling knew everything about me when we were children. (46)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>My sibling and I liked all the same things when we were children (47)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>My sibling and I had a lot in common as children. (48)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>I feel I can be myself with my sibling. (1)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>My sibling and I have some common interests and some differences. (2)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>I am comfortable with some degree of conflict with my sibling. (3)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>My sibling and I are different from each other in some ways. (4)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>If I disagree with something my sibling is doing, I usually feel free to say so. (5)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>My sibling feels he/she can be himself/herself with me. (6)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>
My sibling feels that I and my sibling have some common interests and some differences. (7)
My sibling is comfortable with some degree of conflict with me. (8)
My sibling would say that we are different from each other in some ways. (9)
If my sibling disagrees with something I am doing, he/she usually feels free to say so. (10)
Q55 Please answer the following questions about the sibling you selected.

_____ I feel distant from my sibling (1)
_____ I don't feel related to my sibling most of the time (2)
_____ I feel like an outsider with my sibling (3)
_____ I feel close to my sibling (4)
_____ Even around my sibling I don't feel that I really belong (5)
_____ I am able to relate to my sibling (6)
_____ I feel understood by my sibling (7)
_____ I see my sibling as friendly and approachable (8)
_____ I have little sense of togetherness with my sibling (9)
_____ My sibling feels distant from me (10)
_____ My sibling does not feel related to me most of the time (11)
_____ My sibling feels like an outsider with me (12)
_____ My sibling feels close to me (13)
_____ Even around me, my sibling does not feel that he/she really belongs (14)
_____ My sibling is able to relate to me (15)
_____ My sibling feels understood by me (16)
_____ My sibling sees me as friendly and approachable (17)
_____ My sibling has little sense of togetherness with me (18)

Q58 On a scale of 1 - 10, how satisfied are you with your relationship with the sibling you selected? 1 is not at all satisfied and 10 is as satisfied as can be.

_____ How satisfied are you with your current sibling relationship? (1)
Q56 The following circles represent possible degrees of closeness within relationships.

Q57 Using these circles, please answer the following questions.

____ Which diagram best represents how close you feel you are to your sibling? (1)
____ Which diagram best represents how close you think you should be to your sibling? (2)
____ Which diagram best represents how close your sibling thinks he/she is to you? (3)
____ Which diagram best represents how close your sibling think he/she should be to you? (4)

Q30 Are you currently in a romantic/intimate relationship?

☐ Yes (1)
☐ No (2)

Display This Question:
If Are you currently in a romantic/intimate relationship? Yes Is Selected
Q31 On a scale of 1 - 10, how satisfied are you with your current intimate relationship? 1 is not at all satisfied and 10 is as satisfied as can be.

____ How satisfied are you with your current intimate relationship? (1)

Display This Question:
If Are you currently in a romantic/intimate relationship? Yes Is Selected
Q33 Please answer the following questions about your current romantic partner.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree (1)</th>
<th>Generally Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Generally Disagree (4)</th>
<th>Strongly Disagree (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel I can be myself with my partner (1)</td>
<td>☐</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My partner and I have some common interests and some differences (2)</td>
<td>☐</td>
<td>☐</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statement</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>I am comfortable with some degree of conflict with my partner (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My partner and I are different from each other in some ways (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If I disagree with something my partner is doing, I usually feel free to say so. (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My partner feels he/she can be himself/herself with me. (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My partner feels that I and my partner have some common interests and some differences (7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My partner is comfortable with some degree of conflict with me. (8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My partner would say that we are different from each other in some ways. (9)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If my partner disagrees with something I am doing, he/she usually feels free to say so. (10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Display This Question:
If Are you currently in a romantic/intimate relationship? Yes Is Selected
Q34 Please answer the following questions about your current romantic partner.

_____ I feel distant from my partner (1)
_____ I don't feel related to my partner most of the time (2)
_____ I feel like an outsider with my partner (3)
_____ I feel close to my partner (4)
_____ Even around my partner I don't feel that I really belong (5)
_____ I am able to relate to my partner (6)
_____ I feel understood by my partner (7)
_____ I see my partner as friendly and approachable (8)
_____ I have little sense of togetherness with my partner (9)
_____ My partner feels distant from me (10)
_____ My partner does not feel related to me most of the time (11)
_____ My partner feels like an outsider with me (12)
_____ My partner feels close to me (13)
_____ Even around me, my partner does not feel that he/she really belongs (14)
_____ My partner is able to relate to me (15)
_____ My partner feels understood by me (16)
_____ My partner sees me as friendly and approachable (17)
_____ My partner has little sense of togetherness with me (18)
Q35 Using these circles, please answer the following questions.

_____ Which diagram best represents how close you feel you are to your partner? (1)

_____ Which diagram best represents how close you think you should be to your partner? (2)

_____ Which diagram best represents how close your partner thinks he/she is to you? (3)

_____ Which diagram best represents how close your partner think he/she should be to you? (4)
Appendix B: Tables
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Table 1. Key Terms and Operational Definitions</strong></td>
<td></td>
</tr>
<tr>
<td>Siblings</td>
<td>People who lived in the same home the majority of the days (&gt; 4) per week growing up</td>
</tr>
<tr>
<td><strong>Sibling Relationship Quality</strong></td>
<td>A construct comprised of bi-directional and reciprocal warmth, closeness, conflict, and rivalry between siblings</td>
</tr>
<tr>
<td>Differentiation</td>
<td>Differentiation is the degree to which one’s emotions and intellect are fused or the ability to regulate one’s emotional and physical distance from others. In this dissertation, \textit{distance regulation} is used in place of differentiation.</td>
</tr>
<tr>
<td>Triangles</td>
<td>An emotional system that describes the way three people relate to each other and involve others in the emotional issues between them (Bowen, 1985). When individuals are highly differentiated, they can remove themselves from the triangle, or \textit{detriangulate} themselves.</td>
</tr>
<tr>
<td>Multigenerational transmission process</td>
<td>How children inherit levels differentiation and learn patterns of family functioning from their parents (Bowen, 1985).</td>
</tr>
<tr>
<td>Nuclear family emotional system</td>
<td>The different ways of relating within the nuclear family (i.e., spouse-to-spouse, parent-child) and is often referred to as the family of origin (Bowen, 1985).</td>
</tr>
<tr>
<td>Family projection process</td>
<td>Patterns through which parents project their issues onto their children, namely anxiety (Bowen, 1985).</td>
</tr>
<tr>
<td>Sibling position</td>
<td>Sibling position is the birth order of those in the sibling subsystem, including the prescribed roles associated with birth position (Bowen, 1985).</td>
</tr>
<tr>
<td>Emotional Cutoff</td>
<td>Emotional cutoff is a distance regulation tactic that can occur through emotional distance or physical distance (Kerr &amp; Bowen, 1988).</td>
</tr>
<tr>
<td>Societal Emotional Processes</td>
<td>How society at large affects the family emotional process (Kerr &amp; Bowen, 1988)</td>
</tr>
<tr>
<td>Interpersonal Factors</td>
<td>Variables related to the relationship shared between individuals (e.g., relationship satisfaction)</td>
</tr>
<tr>
<td>Intrapersonal Factors</td>
<td>Variables that occur within an individual (e.g., depression)</td>
</tr>
</tbody>
</table>
Table 2. Scale Reliability Statistics for Subsample (n=338)

<table>
<thead>
<tr>
<th>Scale</th>
<th># of items</th>
<th>Alpha α</th>
</tr>
</thead>
<tbody>
<tr>
<td>AdultSibship_Avg</td>
<td>11</td>
<td>.97</td>
</tr>
<tr>
<td>ChildSibship_Avg</td>
<td>11</td>
<td>.92</td>
</tr>
<tr>
<td>PHQ9_AVG</td>
<td>9</td>
<td>.88</td>
</tr>
<tr>
<td>SF8_3ITM_AVG</td>
<td>3</td>
<td>.72</td>
</tr>
<tr>
<td>COUP_RELSATIS</td>
<td>1</td>
<td>n/a</td>
</tr>
<tr>
<td>SCRSSIB_I2SIB</td>
<td>9</td>
<td>.95</td>
</tr>
<tr>
<td>SCRSSIB_SIB2ME</td>
<td>9</td>
<td>.95</td>
</tr>
<tr>
<td>SITA_I2SIB</td>
<td>4</td>
<td>.78</td>
</tr>
<tr>
<td>SITA_SIB2ME</td>
<td>4</td>
<td>.79</td>
</tr>
<tr>
<td>SIB FDR</td>
<td>4</td>
<td>.86</td>
</tr>
<tr>
<td>SCRSCPL_I2CPL</td>
<td>9</td>
<td>.93</td>
</tr>
<tr>
<td>SCRSCPL_CPL2ME</td>
<td>9</td>
<td>.94</td>
</tr>
<tr>
<td>SITA_I2CPL</td>
<td>4</td>
<td>.74</td>
</tr>
<tr>
<td>SITACPL_CPL2ME</td>
<td>5</td>
<td>.73</td>
</tr>
<tr>
<td>CPL FDR</td>
<td>4</td>
<td>.86</td>
</tr>
</tbody>
</table>

Note. The variables AdultSibship_Avg and Childsibship_Avg represent the average score from the LSRS of the Adult and Child sibling relationship, respectively. PHQ9_AVG was the measure for depression, SF8_3ITM_AVG was the measure for general perceptions of health, and COUP_RELSATIS was the couple relationship satisfaction item. SCS-R represents the Social Connectedness Scale Revised. SITA represents the Separation Individuation Test of Adolescents. I2CPL and I2SIB represents questions that assess the perspective of the participant on the couple and sibling relationship, respectively. CPL2ME and SIB2ME represents questions that assess the participant’s perspective of their partner and sibling’s perspective of the relationship, respectively. SIB FDR and CPL FDR are the average total scores from all each perspective on the SITA and SCS-R.
Table 3. Descriptive Statistics for Model Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>M (SD)</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>AdultSibship_Avg</td>
<td>476</td>
<td>3.54 (1.17)</td>
<td>1.0</td>
<td>5.0</td>
</tr>
<tr>
<td>ChildSibship_Avg</td>
<td>476</td>
<td>3.23 (.95)</td>
<td>1.0</td>
<td>5.0</td>
</tr>
<tr>
<td>PHQ9_AVG</td>
<td>476</td>
<td>1.66 (.64)</td>
<td>1.0</td>
<td>4.0</td>
</tr>
<tr>
<td>SF8_3ITM_AVG</td>
<td>476</td>
<td>4.15 (.84)</td>
<td>1.0</td>
<td>6.0</td>
</tr>
<tr>
<td>SITACPL_CPL2ME</td>
<td>338</td>
<td>4.30 (.59)</td>
<td>2.0</td>
<td>5.0</td>
</tr>
<tr>
<td>SCRSCPL_CPL2ME</td>
<td>338</td>
<td>5.05 (1.20)</td>
<td>1.0</td>
<td>6.0</td>
</tr>
<tr>
<td>SCRSCPL_I2CPL</td>
<td>338</td>
<td>5.02 (1.17)</td>
<td>1.0</td>
<td>6.0</td>
</tr>
<tr>
<td>SCRSSIB_I2SIB</td>
<td>476</td>
<td>4.11 (1.60)</td>
<td>1.0</td>
<td>6.0</td>
</tr>
<tr>
<td>SCRSSIB_SIB2ME</td>
<td>476</td>
<td>4.21 (1.54)</td>
<td>1.0</td>
<td>6.0</td>
</tr>
<tr>
<td>SITA_I2SIB</td>
<td>476</td>
<td>3.61 (.97)</td>
<td>1.0</td>
<td>5.0</td>
</tr>
<tr>
<td>SITA_SIB2ME</td>
<td>476</td>
<td>3.69 (.91)</td>
<td>1.0</td>
<td>5.0</td>
</tr>
<tr>
<td>SITA_I2CPL</td>
<td>338</td>
<td>4.22 (.70)</td>
<td>1.0</td>
<td>5.0</td>
</tr>
<tr>
<td>COUP_RELSATIS</td>
<td>338</td>
<td>8.05 (2.37)</td>
<td>1.0</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Note. The variables AdultSibship_Avg and Childsibship_Avg represent the average score from the LSRS of the Adult and Child sibling relationship, respectively. PHQ9_AVG was the measure for depression, SF8_3ITM_AVG was the measure for general perceptions of health, and COUP_RELSATIS was the couple relationship satisfaction item. SCS-R represents the Social Connectedness Scale Revised. SITA represents the Separation Individuation Test of Adolescents. I2CPL and I2SIB represents questions that assess the perspective of the participant on the couple and sibling relationship, respectively. CPL2ME and SIB2ME represents questions that assess the participant’s perspective of their partner and sibling’s perspective of the relationship, respectively. SIB FDR and CPL FDR are the average total scores from all each perspective on the SITA and SCS-R.
**Table 4. Sample Demographics**

<table>
<thead>
<tr>
<th></th>
<th>( n )</th>
<th>( M ) (SD)</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>475</td>
<td>45.38 (15.53)</td>
<td>18.00</td>
<td>75.00</td>
</tr>
<tr>
<td>Number of Siblings</td>
<td>470</td>
<td>2.50 (1.64)</td>
<td>1.00</td>
<td>11.00</td>
</tr>
<tr>
<td>Romantic Relationship</td>
<td>347</td>
<td>17.17 (14.0)</td>
<td>.17</td>
<td>72.00</td>
</tr>
<tr>
<td>Length (in years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>Valid %</td>
<td></td>
</tr>
<tr>
<td>Gender (( n=475 ))</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>119</td>
<td>25.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>356</td>
<td>74.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual Orientation (( n=475 ))</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterosexual</td>
<td>417</td>
<td>87.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homosexual</td>
<td>25</td>
<td>5.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bisexual</td>
<td>28</td>
<td>5.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race/Ethnicity (( n=475 ))</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White/Caucasian</td>
<td>418</td>
<td>88.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not White/Caucasian</td>
<td>57</td>
<td>12.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently in a Romantic Relationship (( n=469 ))</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>338</td>
<td>72.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>131</td>
<td>27.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of Education (( n=474 ))</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College+ (Bachelors or higher)</td>
<td>354</td>
<td>74.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No College</td>
<td>120</td>
<td>25.3</td>
<td></td>
<td></td>
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</tbody>
</table>
Table 5. Subsample Demographics (n=338)

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>M(SD)</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>337</td>
<td>45.87 (15.23)</td>
<td>18.0</td>
<td>75.0</td>
</tr>
<tr>
<td>Number of Siblings</td>
<td>334</td>
<td>2.58 (1.75)</td>
<td>1.0</td>
<td>11.0</td>
</tr>
<tr>
<td>Romantic Relationship Length (in years)</td>
<td>327</td>
<td>16.97 (14.26)</td>
<td>.17</td>
<td>72.0</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Valid %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (n=338)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>88</td>
<td>26.0</td>
</tr>
<tr>
<td>Female</td>
<td>249</td>
<td>73.7</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>.3</td>
</tr>
<tr>
<td>Sexual Orientation (n=337)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterosexual</td>
<td>301</td>
<td>89.3</td>
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<tr>
<td>Homosexual</td>
<td>14</td>
<td>4.2</td>
</tr>
<tr>
<td>Bisexual</td>
<td>20</td>
<td>5.9</td>
</tr>
<tr>
<td>Other</td>
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<td>.6</td>
</tr>
<tr>
<td>Race/Ethnicity (n=338)</td>
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<td></td>
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<tr>
<td>White/Caucasian</td>
<td>303</td>
<td>89.6</td>
</tr>
<tr>
<td>Not White/Caucasian</td>
<td>35</td>
<td>10.4</td>
</tr>
<tr>
<td>Level of Education (n=338)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College+ (Bachelors or higher)</td>
<td>261</td>
<td>77.2</td>
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<tr>
<td>No College</td>
<td>77</td>
<td>22.8</td>
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Table 6. Dyadic Structural Variables

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>M (SD)</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Difference</td>
<td>446</td>
<td>4.39 (3.97)</td>
<td>0</td>
<td>58.00</td>
</tr>
<tr>
<td>Relationship Satisfaction</td>
<td>468</td>
<td>6.34 (3.17)</td>
<td>1.0</td>
<td>10.0</td>
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</table>

<table>
<thead>
<tr>
<th>Genetic Relatedness (n=454)</th>
<th>Frequency</th>
<th>Valid %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full</td>
<td>390</td>
<td>85.9</td>
</tr>
<tr>
<td>Half</td>
<td>43</td>
<td>9.5</td>
</tr>
<tr>
<td>Adopted</td>
<td>7</td>
<td>1.5</td>
</tr>
<tr>
<td>Step</td>
<td>3</td>
<td>0.7</td>
</tr>
<tr>
<td>Cousin</td>
<td>3</td>
<td>0.7</td>
</tr>
<tr>
<td>Twin</td>
<td>8</td>
<td>1.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender Composition (n=462)</th>
<th>Frequency</th>
<th>Valid %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brothers</td>
<td>59</td>
<td>12.8</td>
</tr>
<tr>
<td>Mixed - Participant is Male</td>
<td>52</td>
<td>11.3</td>
</tr>
<tr>
<td>Mixed - Participant is Female</td>
<td>142</td>
<td>30.7</td>
</tr>
<tr>
<td>Sisters</td>
<td>209</td>
<td>45.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participant Position in the Dyad (n=446)</th>
<th>Frequency</th>
<th>Valid %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older</td>
<td>229</td>
<td>51.3</td>
</tr>
<tr>
<td>Younger</td>
<td>209</td>
<td>46.9</td>
</tr>
<tr>
<td>Twin</td>
<td>8</td>
<td>1.8</td>
</tr>
</tbody>
</table>
Table 7. Scale Correlations

<table>
<thead>
<tr>
<th></th>
<th>PHQ9_AVG</th>
<th>SF8_3ITM_AVG</th>
<th>SITACPL_CPL2ME</th>
<th>SCRSCPL_CPL2ME</th>
<th>SCRSCPL_I2CPL</th>
<th>SCRSSIB_I2SIB</th>
<th>SCRSSIB_SIB2ME</th>
<th>SITA_I2SIB</th>
<th>SITA_SIB2ME</th>
<th>SITA_I2CPL</th>
<th>COUP_RELSATIS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p</strong>&lt;.01*</td>
<td><strong>p</strong>&lt;.05</td>
<td><strong>p</strong>&lt;.01*</td>
<td><strong>p</strong>&lt;.01*</td>
<td><strong>p</strong>&lt;.01*</td>
<td><strong>p</strong>&lt;.01*</td>
<td><strong>p</strong>&lt;.01*</td>
<td><strong>p</strong>&lt;.01*</td>
<td><strong>p</strong>&lt;.01*</td>
<td><strong>p</strong>&lt;.01*</td>
<td><strong>p</strong>&lt;.01*</td>
<td><strong>p</strong>&lt;.01*</td>
</tr>
<tr>
<td><strong>n</strong>=338</td>
<td><strong>n</strong>=476</td>
<td><strong>n</strong>=476</td>
<td><strong>n</strong>=338</td>
<td><strong>n</strong>=338</td>
<td><strong>n</strong>=338</td>
<td><strong>n</strong>=338</td>
<td><strong>n</strong>=338</td>
<td><strong>n</strong>=338</td>
<td><strong>n</strong>=338</td>
<td><strong>n</strong>=338</td>
<td><strong>n</strong>=338</td>
</tr>
</tbody>
</table>

Note. The variables AdultSibship_Avg and Childsibship_Avg represent the average score from the LSRS of the Adult and Child sibling relationship, respectively. PHQ9_AVG was the measure for depression, SF8_3ITM_AVG was the measure for general perceptions of health, and COUP_RELSATIS was the couple relationship satisfaction item. SCS-R represents the Social Connectedness Scale Revised. SITA represents the Separation Individuation Test of Adolescents. I2CPL and I2SIB represents questions that assess the perspective of the participant on the couple and sibling relationship, respectively. CPL2ME and SIB2ME represents questions that assess the participant’s perspective of their partner and sibling’s perspective of the relationship, respectively. SIB FDR and CPL FDR are the average total scores from all each perspective on the SITA and SCS-R.
Table 8. Correlations of closeness and age difference.

<table>
<thead>
<tr>
<th></th>
<th>SCSR I2</th>
<th>SCSR SIB2</th>
<th>SCSR SIB</th>
<th>Adult SIB</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCSR SIB FULL</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCSR_I2SIB</td>
<td>.98**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCSR_SIB2ME</td>
<td>.97**</td>
<td>.90**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child_Sibship</td>
<td>.36**</td>
<td>.34**</td>
<td>.35**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Sib Age Difference</td>
<td>-.10*</td>
<td>-.10*</td>
<td>-.10*</td>
<td>.03</td>
<td>1</td>
</tr>
<tr>
<td>Adult Sibship</td>
<td>.81**</td>
<td>.82**</td>
<td>.76**</td>
<td>.45**</td>
<td>-.12*</td>
</tr>
</tbody>
</table>

**p<.01 *p<.05

Note. The variables Adult Sibship and Child Sibship represent the average score from the LSRS of the Adult and Child sibling relationship, respectively. SCS-R represents the Social Connectedness Scale Revised. I2SIB represents questions that assess the perspective of the participant on the couple and sibling relationship, respectively and SIB2ME represents questions that assess the participant’s perspective of their partner and sibling’s perspective of the relationship, respectively.
Table 9. Significant Sibling and other Sibling Subsystem Demographics.

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>M (SD)</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>446</td>
<td>44.14(16.25)</td>
<td>2.0</td>
<td>82.0</td>
</tr>
<tr>
<td>Years lived in household with participant</td>
<td>440</td>
<td>15.74 (4.17)</td>
<td>0</td>
<td>30.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Valid %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lived In the same household</td>
<td>Yes</td>
<td>434</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>15</td>
</tr>
<tr>
<td>Health Diagnosis</td>
<td>Multiple Indicated</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Related to Physical Health</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>Related to Mental Health</td>
<td>134</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>258</td>
</tr>
<tr>
<td></td>
<td>Not sure</td>
<td>7</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>202</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>261</td>
</tr>
<tr>
<td>Type of Significant Sib</td>
<td>Only has one sibling</td>
<td>156</td>
</tr>
<tr>
<td>Selected from Subsystem</td>
<td>Only has full siblings</td>
<td>206</td>
</tr>
<tr>
<td></td>
<td>Only has half siblings</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Only has adopted sibs/cousins</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Picked full sibling, has siblings with less relatedness</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>Picked half sibling, has full</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Does not have full siblings, picked most related</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Does not have full siblings, picked least related</td>
<td>1</td>
</tr>
</tbody>
</table>
Appendix C: Figures
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Figure 1. Original Conceptual Model

Note. SCS-R represents the Social Connectedness Scale Revised. SITA represents the Separation Individuation Test of Adolescents. I2CPL and I2SIB represent questions that assess the perspective of the participant on the couple and sibling relationship, respectively. CPL2ME and SIB2ME represent questions that assess the participant’s perspective of their partner and sibling’s perspective of the relationship, respectively.
Note. SCS-R represents the Social Connectedness Scale Revised. SITA represents the Separation Individuation Test of Adolescents. I2CPL and I2SIB represents questions that assess the perspective of the participant on the couple and sibling relationship, respectively. CPL2ME and SIB2ME represents questions that assess the participant’s perspective of their partner and sibling’s perspective of the relationship, respectively.
Figure 3. Direct Effects Model

Note. Model Fit: $X^2(2) = 17.42 (p < .001)$; NFI = .923; CFI = .929; RMSEA = .151. Insignificant paths are represented by dashed lines, significant paths are represented by solid lines. Insignificant $\beta$ statistics were omitted to preserve model clarity.

***$p < .001$  **$p < .01$  *$p < .05$
Figure 4. Interaction of gender composition and age difference on sibling closeness.

Note. Error bars represent a 95% confidence interval.
**Figure 5.** Full conceptual model with results.

*Note. Model Fit: \( \chi^2(56) = 72.76 \) (\( p = .045 \)); NFI=.975, CFI=.993; RMSEA=.032. dcpl- disturbance of couple distance regulation; dsib- disturbance of sibling distance regulation SCS-R represents the Social Connectedness Scale Revised. SITA represents the Separation Individuation Test of Adolescents. I2CPL and I2SIB represents questions that assess the perspective of the participant on the couple and sibling relationship, respectively. CPL2ME and SIB2ME represents questions that assess the participant’s perspective of their partner and sibling’s perspective of the relationship, respectively. Insignificant paths are represented by dashed lines, significant paths are represented by solid lines. Insignificant \( \beta \) statistics were omitted to preserve model clarity. Significant Indirect Effects Paths: ChildSibShip→CPL FDR→HRQOL= .04*; ChildSibShip→CPL FDR→PHQ9= -.02*; ChildSibShip→CPL FDR→RelSatis= .29* ***p<.001 **p<.01 *p<.05*