Family Separateness’ and Connectedness’ Impact on Sibling Relationships, Stress and Depression during Emerging Adulthood

THESIS

Presented in Partial Fulfillment of the Requirements for the Degree Master of Science in the Graduate School of The Ohio State University

By

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2015

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Abstract

Siblings serve an important role within each other’s lives throughout the life course. The relationships between siblings do not develop in isolation; sibling relationships are governed by the rules and expectations of the family of origin. One of these characteristics is family distance regulation, which consists of two components: separateness and connectedness. The interplay between these two components may influence the quality of the sibling relationship as well as individual outcomes, such as stress and depression. This study utilized Actor Partner Interdependence Models to understand the associations between these variables within sixty four sibling pairs (thirty three female female dyads, thirty one female male dyads) during emerging adulthood, a transitional developmental period. Overall, it appears that family distance regulation is not associated with sibling relationship quality, save for within female male dyads. Brother’s separateness was associated with lower sister’s perceived warmth between siblings. Additionally, distinct patterns emerged between warmth and individual stress based on the gender make up of the dyad. Both sisters’ warmth was associated with lower personal stress and higher sibling stress. This may indicate that during times of stress, sisters reach out to their other sister, signaling that the relationship is valued, thus
increasing the warmth between the two siblings. This increase in warmth affirms that the individual has a support person in their sister, thus lowering their personal stress levels. Brothers’ warmth was associated with higher sisters’ stress and sisters’ stress was associated with higher brothers’ stress. This may indicate that if the sibling relationship is highly valued, i.e. has higher warmth, the transitions of emerging adulthood may constrain the relationship, which increases the stress experienced by the siblings. Finally, personal stress was associated with higher personal depression, furthering the importance of sibling relationships during this time period. These results indicate that the sibling relationship may be a crucial support figure during the transitional period of emerging adulthood. Future research should replicate these findings to further the field’s understanding of sibling relationships and explore how the family of origin influences siblings. With continued research and investigation, interventions could be developed to foster sibling relationships to enhance their protective factors, especially during emerging adulthood.
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Chapter 1: Family Separateness’ and Connectedness’ Impact on Sibling Relationships, Stress and Depression during Emerging Adulthood

As of 2013, eighty percent of the American population (United States Census Bureau, 2013) and roughly a third of the world has at least one sibling (Lippman, Wilcox, & Ryberg, 2013). Sibling relationships are some of the longest relationships individuals will experience. Siblings normatively outlive their parents, support each other after intimate relationships dissolve, and are easier to remain in contact with than friends (Cicirelli, 1994). Sibling relationships develop within the family system and thus are influenced by the boundaries and expectations of that system. It has yet to be explored how family processes influence the sibling subsystem across the lifespan, especially during emerging adulthood, when many new life transitions take place (i.e., leaving the home, entering romantic relationships, etc.). Transitions in emerging adulthood, especially multiple transitions, can disrupt individuals’ routines causing stress and potential distress. It is possible that positive sibling interactions can help buffer individuals from the negative effects of these transitions during emerging adulthood. The current study explores both of these ideas by examining how family of origin processes impact the quality of sibling relationships, and how the quality of these relationships impacts individual outcomes during emerging adulthood.
Sibling relationships, similar to parent-child relationships, begin to develop from the birth of the sibling. Older siblings appear to be able to provide emotional support for their younger siblings, sometimes assuming the role of the caretaker as early as two years old (Teti & Ablard, 1989). Younger siblings are not passive within these relationships, even in early childhood. When observed over time, younger infant siblings’ actions predicted older toddler siblings’ responses, with more social infants eliciting more social interactions from the toddlers (Lamb, 1978). These social interactions during the younger child’s infancy lay the foundation for the sibling relationships. When siblings move into middle childhood, their relationship becomes a model for interactions with peers (Lockwood, Kitzmann, & Cohen, 2001). Intimacy between siblings boosts competence within peer relationships and appears to provide some protection against depression (Kim, McHale, Crouter, & Osgood, 2007). Sibling conflict also serves a role within individual sibling’s development; higher levels of conflict with a sibling are associated with increases in levels of anxiety, depression and delinquent behavior during older siblings’ adolescence (Stocker, Burwell, & Briggs, 2002).

Levels of warmth and conflict between siblings are also influenced by marital and parental relationships. Marital conflict is associated with higher levels of conflict within sibling relationships (Stocker, Burwell, & Briggs, 2002; Stocker, & Youngblade, 1999). Warmth within paternal and maternal relationships decreases the level of hostility and rivalry experienced by siblings (Stocker & McHale, 1992), and warmth within the paternal relationship increases the level of warmth between siblings (1992). These
associations are not surprising as the parental and the sibling relationship exist within the same family system which share similar rules and expectations.

Siblings typically grow up within the same household and thus are exposed to many of the same parenting and family processes (Martinez, Daniels, & Chandra, 2012). Family distance regulation (FDR, Bartle-Haring & Sabatelli, 1998; M. Bowen, 1976) is one of the processes within the family that influences the amount of warmth and intimacy experienced in sibling relationships. FDR is comprised of two components, separateness and connectedness, and each component should exist in a balance for optimal functioning. That is, when FDR provides each individual within the family system with a sense of belonging as well as a sense of individuality, then relationships in the system, theoretically, are warmer, more intimate, and more supportive (Bartle-Haring & Sabatelli, 1998). However, when there is too much separateness at the expense of connectedness, individuals gain a strong sense of autonomy but fail to understand how to connect and rely on others. Forming new relationships outside of the family unit is one of the hallmarks of forming one’s own sense of identity (Waterman, 1982); the failure to do so may hinder the individual’s ability to successfully develop during emerging adulthood, when many new relationships are formed that assist the individual later on in life. When too much connectedness occurs, at the expense of separateness, individuals gain a strong sense of support and security but lose their sense of self, sacrificing their identity to be part of the family as a whole. This loss of self, or too much connectedness, has the potential to cause psychological distress as the individual grows and moves away from
the family of origin. This process of leaving the home typically occurs during emerging adulthood when individuals attend college or move out and obtain employment.

A fairly new theoretical developmental period, emerging adulthood occurs between the ages of 18 and 25, a period during which, in most Westernized cultures, children move out of the childhood home and begin to take on adult roles and responsibilities. Emerging adulthood is characterized by increases in independence and personal responsibility and shifts in living arrangements and environments (Arnett, 2000). All of these changes lead to increases in stress levels within individuals, making emerging adults the developmental group with one of the highest stress levels within the United States (American Psychiatric Association, 2014). This is concerning as many of these emerging adults are laying the foundation for their personal relationships and professional trajectories, and performance in all of these areas is impacted by stress. Higher levels of stress produce poorer academic performance (Zajacova, Lynch, & Espenshade, 2005) and job performance, lower job satisfaction (Elangovan, 2001; Murphy, 1996), and less sexual activity and lower relationship satisfaction (Bodenmann, Ledermann, & Bradbury, 2007). High levels of stress also are related to poor mental health, including increases in depressive symptoms (Liu & Alloy, 2010). Depressive symptoms can compound the harmful effects of stress (Liu & Alloy), further hindering the individual’s development. To prevent these maladaptive outcomes, it becomes increasingly important for emerging adults to develop ways of coping with stress, such as seeking out support from family members.
Changes during emerging adulthood are made in an attempt to achieve the primary developmental goal, which is to form an individual identity apart from the family of origin (Arnett, 2000). When an individual has developed within a family system with a balance of connectedness and separateness, they have gained strengths and skills that help them mitigate new stressors within their lives, even when the stressors are numerous (Friendman, 1991). However, if an individual has developed within a family that is either too connected or too separate, they have learned a limited set of skills to handle stress, and even small stressors can have serious negative impacts (1991). These deficits in coping are amplified for emerging adults as the child begins to transition to adult roles. Many emerging adults move out of their childhood home, causing a reduction in contact with the family, which can result in higher levels of stress (Sneed, 2006). When faced with socio-emotional problems, emerging adults may utilize maladaptive coping strategies such as self-punishment (Brougham, Zail, Mendoza, & Miller, 2009). To relieve stress, they may seek support from their support networks. If an individual’s level of separateness is too high, they may have alienated these support networks and their protective influence. If an individual’s level of connectedness is too high, they may give into family demands for closeness, and take a step backwards in their development. The influence of these levels and their consequences may become compounded as more children/siblings fail to reach the developmental goal during an already stressful period, leading to an increased chance of negative individual outcomes. However, the presence of a sibling facing similar familial pressures may help ease the strain of this period.
The average age difference between siblings in the United States is around two and a half years (Martinez, Daniels, & Chandra, 2012), meaning the majority of siblings will experience emerging adulthood together. This creates a sense of connection and intimacy, as they face similar challenges at the same time. This connection may be expressed through increases in emotional exchanges between siblings as the number of activities in which both siblings are present decreases (Scharf, Shulman, & Avigad-Spitz, 2005). These emotional exchanges may be part of the reason why several studies have shown an increase in warmth between siblings during emerging adulthood (Scharf, Shulman, & Avigad-Spitz, 2005; Stocker, Lanthier, & Furman, 1997). Increases in warmth could help individuals cope with the stress of emerging adulthood. With siblings in particular, warm exchanges decrease negative psychological symptoms such as depression and loneliness (Milevsky, 2005). However, there needs to be a balance between providing support and fusion in the sibling relationship.

The current study will examine the association between perceptions of family separateness and connectedness and its impact on levels of warmth in sibling relationships, stress and depression levels for individuals. Structural equation modeling will be utilized to examine these associations within emerging adult sibling dyads. Actor-Partner Interdependence Models (APIMs) will be used to account for the dyadic nature of these relationships and to examine the interaction between the two siblings. This study extends the existing literature by: 1) exploring how family of origin modifies the sibling subsystem; 2) examining how family separateness and connectedness interacts with stress
during emerging adulthood; and 3) inquires if sibling relationships can impact individual stress and depression levels.

**Hypotheses**

Hypothesis 1. Higher levels of connectedness will be associated with higher levels of sibling warmth, perceived stress, and depression levels in both siblings; higher levels of separateness will be associated with lower levels of sibling warmth and higher levels of perceived stress and depression.

Hypothesis 2. Sibling warmth will mediate the effect of higher separateness and connectedness on stress and depression levels; specifically, the more warmth perceived by one sibling, the lower the personal stress levels and the lower depressive symptoms will be despite levels of separateness and connectedness.

Hypothesis 3. Partner effects will exist between separateness and connectedness and sibling warmth. Specifically, the more connectedness perceived by sibling 1, the more warmth and less stress and depression sibling 2 will experience and the more separateness perceived by sibling 1, the less warmth and more stress and depression sibling 2 will experience and vice versa.

Hypothesis 4. Actor and partner effects will be stronger within female-female dyads compared to female-male dyads.

**Methods**

Participants for this study took part in a larger study to examine how family relationships impact individual outcomes during the fall of 2013 through winter of 2014. Research associates attended several undergraduate Human Sciences courses at a large,
Midwestern university and presented a brief overview of the study. To participate, individuals must have been 18-25 years old and had a sibling 18-25 years old as well. Email addresses were collected from interested individuals for both themselves and their sibling. Online surveys containing several self report measures were emailed to both siblings individually using Qualtrics. Informed consent was acquired before any of the study measures were presented to the participants and each of the participants were compensated for their time and effort.

The final sample that will be utilized for the proposed study will consist of 64 sibling pairs (128 individuals). Thirty four of the pairs are female-female and thirty one female-male with a total of ninety-five females and fifty-one males. A majority of the participants identified as Caucasian (85%), twenty years old or younger (55%), came from two biological parent households (97%) and had a yearly income of less than $18,000 (86%). The average age difference between the siblings was 2.17 years.

Measures

*Family Separateness:* Six items from the Separation-Individuation Test of Adolescence (SITA: Levine, Green, & Millon, 1986) were used to measures the amount of separateness perceived by the individuals between themselves and their parents and sibling. Items evaluate the balance between one’s personal identity and their identity as part of the family unit. Each item is rated on a 5 point Likart scale on how much a participant felt the item represented their experience with their mother, father, and sibling (1 = strongly disagree, 5 = strongly agree) (Note. 1, 3, and 6 are reversed coded). An example item is “Even though we're very close, I feel I can be myself.” Reliabilities were
conducted for each of the siblings’ questionnaires and from each family relationship perspective. For Sibling 1, separateness from mothers had a Cronbach’s alpha of .75, separateness from fathers had a Cronbach’s alpha of .86, and separateness from sibling had a Cronbach’s alpha of .77. For Sibling 2, separateness from mothers had a Cronbach’s alpha of .69, separateness from fathers had a Cronbach’s alpha of .78, and separateness from sibling had a Cronbach’s alpha of .54.

*Family Connectedness:* Nine items from the Social Connectedness Scale-Revised (SCSR; Lee, Draper, & Lee, 2001) were used to measure the amount of connectedness that was felt by individuals. Items assessed how easily an individual connects and how comfortable an individual feels with a family member. Each item is rated on a 5 point Likart scale on how much a participant felt the item represented their experience with a family member (1 = strongly disagree, 5 = strongly agree) (Note. Items 1, 3, 6, and 9 are reversed coded). An example item is “Even around my _____, I don’t feel that I really belong” where the blank is filled with mother, father, or sibling. Reliabilities were conducted for each of the siblings’ questionnaires and for each family relationship perspective. For Sibling 1, connectedness from mothers had a Cronbach’s alpha of .91, connectedness from fathers had a Cronbach’s alpha of .93, and connectedness from sibling had a Cronbach’s alpha of .88. For Sibling 2, connectedness from mothers had a Cronbach’s alpha of .84, connectedness from fathers had a Cronbach’s alpha of .85, and connectedness from sibling had a Cronbach’s alpha of .77.

*Sibling Warmth:* The warmth subscale of the Adult Sibling Relationship Questionnaire (ASRQ; Stoker, Lanthier & Furman, 1997) was utilized to measure
warmth within the sibling relationship as perceived by an individual. Forty five items are rated on a 5 point Likart scale indicating how characteristic the item is of their sibling relationship (1 = hardly at all, 5 = too much). An example item is “How much does your sibling think of you as a good friend?” This measure was reliable in the sample used (Cronbach’s alpha = .96).

Perceived Stress: The Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) was used to measure the amount of stress perceived in an individual’s life. Four items are rated on a 5 point Likart scale that measures the frequency at which an individual has experienced an item in the past month (1 = never, 5 = very often). An example item is “In the last month, how often have you felt that you were unable to control the important things in your life?” This measure was reliable in the sample used (Cronbach’s alpha = .82).

Depression. The Patient Health Questionnaire (PHQ9; Kroenke, Spitzer, & Williams, 2001) was used to measure the severity of depressive symptoms experienced in the last two weeks by an individual. The nine items are rated on a 4 point Likart scale that measures the frequency of the stated symptom (1 = not at all, 5 = nearly every day). An example item is “That you are a failure or have let yourself or your family down”. The measure was reliable in the sample used (Cronbach’s alpha = .83).

Sibling Position. In female-female dyads, the older sibling was coded as Sibling 1 and the younger was coded as Sibling 2. In the female-male dyads, the female sibling was coded as Sibling 1 and the male sibling was coded as Sibling 2, regardless of birth order.

Analytical Plan
Hypotheses were examined using Structural Equation Models (SEM) to test the magnitude and the significance of the actor and partner effects in the model. Actor effects are how much one’s own characteristics impact another personal characteristic (i.e. how much sibling 1’s sense of warmth towards sibling impacts their stress levels). Partner effects are how much person 1’s characteristics impacts person 2’s characteristic (i.e. how much sibling 1’s sense of warmth towards sibling impacts sibling 2’s stress levels). This type of SEM is known as an APIM and is one of the more appropriate methods for handling dyadic, non-independent data. Modeling was conducted using AMOS (for Confirmatory Factor Analyses) and M Plus (for APIMs). Missing data was handled with full information maximum likelihood. To assess overall fit, the chi-square test of model fit was used foremost as well as several other fit indices. The fit indices include: root mean square error of approximation (RMSEA), the Comparative Fit Index (CFI), and the Tuckey Lewis Index (TLI). For a model to have good fit, the RMSEA should be below .08 (Browne & Cudeck, 1993) and CFI and TLI should be above .90 (Bentler, 1990; Hu & Bentler, 1999).

**Results**

Before examining the association between the constructs, Confirmatory Factor Analyses (CFA) were conducted to identify which items from the measures used most capture the variables of interest, specifically separateness, connectedness, and warmth, and to create latent variables from the selected items. The base model for all the CFAs included all items from the variables’ respective measurement (FDR for connectedness and separateness for all three perspectives: mother, father, sibling; ASRQ for warmth). In
regards to separateness, the baseline model included all six items from the SITA loaded on to latent variables for separateness from mother, father, and sibling independent of one another. The fit for this model was $\chi^2(df) = 874.879(132)$ $p < 0.001$, RMSEA = .172, CFI = .509, TLI = .364, however variance explained by each item was over twenty percent suggesting the retention of all items (Kim & Mueller, 1978). This prompted the averaging of the six items into one score per person, leading to three observed variables, average separateness from mother, father, and sibling, with one latent variable, overall separateness within the family, loading on to each. The model is presented in Figure 1. The fit improved for this model to $\chi^2(df) = 12.863(8)$ $p < 0.117$, RMSEA = .092, CFI = .958, TFI = .891.

In regards to connectedness, the baseline model includes all nine items from the SCSR loaded on to latent variables for connectedness to mother, father, and sibling independent of one another and the fit was $\chi^2(df) = 2197.561 (321)$ $p < 0.001$, RMSEA = .175, CFI = .569, TFI = .493. The amount of variance explained by the latent variable for each observed variable was examined and those with less than 20% explained were removed, leaving five of the original eight items. These five items were averaged together for each of the family members and loaded onto a latent variable encompassing connectedness within the family. The fit indices for the final model were $\chi^2(df) = 21.35 (8)$ $p < 0.006$, RMSEA = .152, CFI = .938, TFI = .837 and the model is presented in Figure 1.

Regarding warmth, the ASRQ’s warmth subscale can be broken down into nine smaller subscales. Three subscales were selected that appeared to be most relevant to
emotional closeness between siblings: affection, intimacy, and emotional support. The items of these three subscales were totaled and averaged to create three separate scores for each subscale. These three totals were loaded on to one latent variable which encompassed warmth between the siblings. The model fit well, $\chi^2$(df) 7.999(8) $p = 0.434$, RMSEA = .00, CFI = 1.00, TFI = 1.00, and the final model is depicted in Figure 1.

Group comparisons were also conducted based on the gender make up of the sibling dyad. Distinguishability tests were conducted prior to final analyses to determine whether the participants are unique from one another (i.e. from separate statistical populations) or could be interchangeable (i.e. from the same statistical population). The procedure was conducted as advised by Kenny, Kashy & Cook (2006) using the ISAT model. A model that allows for the variance covariance matrix of the model to differ between the siblings was compared to one in which the variance covariance matrix was equivalent between the siblings. For female-female dyads, the chi-square was nonsignificant ($\chi^2$(df) 23.34 (20) $p = 0.27$), indicating that the female siblings were indistinguishable from one another. For female-male dyads, the chi-square was significant ($\chi^2$(df) 45.59 (20) $p < 0.001$), indicating that the male and female siblings are distinguishable. Thus, during final analyses for the female-female dyads, the variance covariance matrix of the endogenous variables were set equivalent, while for the female-male dyads, the variance covariance matrices were free to vary between the siblings.

Upon completion of the CFAs, APIM tests were conducted to examine the associations between separateness, connectedness, sibling warmth, perceived stress and depression for both siblings as well as between siblings, following the recommendations.
of Cook and Kenny (2005). Separateness and connectedness were separated into two independent models due to the high covariance between the two variables. Results are divided based on the two separate models.

**Separateness.** The unconstrained model (i.e. with actor and partner effects freed to vary between the two groups and within sibling pairs) had poor fit: $\chi^2(\text{df}) = 271.32$ (185) $p < 0.001$, RMSEA = 0.122, CFI = 0.85, TLI = 0.81. Then a set of models with pathways constrained to be equivalent both within the sibling dyad and across the groups were compared using a chi-square difference test. The equality constraint was retained if the chi-square difference was found to be nonsignificant. The final model with constraints is presented in Figure 2. The final model had a slight improvement in fit, though it still failed to reach acceptable levels: $\chi^2(\text{df}) = 306.81$ (215) $p < 0.001$, RMSEA = 0.116, CFI = 0.84, TLI = 0.82. Path estimates and standard errors are presented in Table 1.

Examining the female-female dyads, little support was found for the hypotheses; no significant associations were found between separateness and the other variables. However, both significant actor and partner effects were found between sibling warmth and perceived stress. Sibling 1’s (older sister’s) warmth was associated with lower levels of personal stress and higher levels of Sibling 2’s (younger sister’s) stress; similarly, younger sister’s warmth was associated with lower levels of personal stress and higher levels of older sister’s stress. Additionally, actor effects were found between stress and depression, with higher personal stress associated with higher personal depression, for both siblings.
For the female-male dyads, there was partial support for the hypotheses; Sibling 2’s (brother’s) separateness was associated with lower levels of Sibling 1’s (sister’s) warmth. Partner effects were found between warmth and stress; sister’s warmth was associated with higher levels of brother’s stress and brother’s warmth was associated with higher levels of sister’s stress. Actor effects were found between stress and depression; personal stress was associated with higher levels of personal depression in both siblings. This indicates that sister’s warmth mediates the pathway of brother’s separateness on brother’s stress and depression.

**Connectedness.** The unconstrained model had poor fit: $\chi^2(\text{df}) \ 329.11 \ (203) \ p < 0.001$, RMSEA = 0.14, CFI = 0.81, TLI = 0.77. The pathways were constrained and chi-square difference tests were conducted with each constraint as above. The constraint was retained if the chi-square difference was found to be nonsignificant. The final model with constraints is presented in Figure 3. The final model showed a slight increase in fit: $\chi^2(\text{df}) \ 341.33 \ (215) \ p < 0.001$, RMSEA = 0.137, CFI = 0.81, TLI = 0.79, though still fails to meet acceptable levels. Path estimates and standard errors are presented in Table 2. Path estimates and standard errors are presented in Table 2.

For female-female dyads, again, little support was found for the hypotheses; no significant associations were found between connectedness and the other variables. Actor and partner effects were found between warmth and stress; older sister’s warmth was associated with lower personal stress and higher younger sister’s stress while younger sister’s warmth was associated with lower personal stress and higher older sister’s stress.
Actor effects were found between stress and depression with higher personal stress being associated with higher personal depression in both siblings.

For female-male dyads, similar results were found; no significant associations were found between connectedness and other variables. Partner effects emerged between warmth and stress with sisters’ warmth being associated with higher brother’s stress and brother’s warmth being associated with higher sister’s stress. Actor effects were also found between stress and depression with personal stress being associated with higher depression in both siblings.

**Discussion**

The purpose of this study was to understand how levels of separateness and connectedness within the family of origin impact warmth between sibling as well as individuals’ levels of stress and depression. Overall, little support was found for associations between separateness and connectedness and warmth, save for female male dyads; however, distinct patterns arose between warmth and stress in all sibling pairs. Additionally, the results replicate the association between stress and depression, highlighting the strength of the association during the developmental period of emerging adulthood.

One significant association did arise within the female male dyads between separateness and warmth; brother separateness was associated with lower warmth perceived by the sister and the perceived warmth of the sister was associated with higher levels of stress by the brother, leading to higher levels of brother’s depression. This lends some support to the hypothesis that warmth would mediate the relationship between
separateness and stress, though there was no significant association between separateness and stress, leading only to a partial mediation.

The reason that this association does not appear within the female-female dyads may be due to the inherent felt similarity between sisters as opposed to brothers and sisters. If a sister has high levels of separateness, i.e. she has high levels of autonomy and independence, her sister can still relate to her based on their gender while sisters with brothers fail to have this societal link. Mixed gender siblings are taught they are dissimilar as soon as their different genders are established, thus high levels of separateness in the brothers, who are socialized to exhibit this trait (Madson & Trafimow, 2001), broaden this gap between siblings. This may lead to lower levels of warmth perceived by the sister, who is socialized to be the one to foster connections (Madson & Trafimow). During emerging adulthood, sisters may relinquish attempts to reach out to their separate brothers, thus removing their protective factor from his life (Pettit, Roberts, Lewinsohn, Seeley, & Yaroslavsky, 2011). Losing familial support may lead to less coping ability when faced with stress, resulting in higher levels of brothers’ stress and depression.

Within the all models, distinct patterns emerged between sibling warmth and stress based on gender. Within in the female-female dyads, despite separateness and connectedness, sibling warmth was associated with lower personal stress and higher sibling stress. The data were not collected over time, meaning that the models are capturing these associations at one point rather than a progression of events. If this is a one point perspective, it may be demonstrating a bidirectional pattern where when one
sister is stressed (i.e. has higher perceived stress), they reach out to their sister, a common coping method among emerging adult females (Brougham, et al., 2009). By reaching out, the sister may signal that she relies on their sister, thus increasing the perceived warmth by the other sister. This increase in warmth may cause the other sister to feel needed and believe they have someone who is there for them if they themselves became stress, which lowers her personal stress levels (Stephens, Franks, & Townsend, 1994).

A slightly different pattern arose within the female-male dyads; personal perceived warmth between siblings was associated with higher levels of sibling stress in both genders, despite separateness and connectedness. These associations may develop due to the changes that accompany emerging adulthood; if the siblings were close, i.e. had higher levels of warmth, and they move away from one another or are busier due to more responsibilities, they may not be able to connect and support one another as they had in the past, thus increasing their stress levels. The levels of warmth between these sibling highlight that the sibling relationship was important to them and was most likely a source of support, especially within mixed dyads (Stocker, Lanthier, & Furman, 1997). Emerging adulthood forces both siblings to adapt and can strain relationships (Conger & Little, 2010), causing increased stress within the dyad.

The current results replicate the positive association between stress and depression; higher levels of personal stress are associated with higher levels of depression for all individuals within the study. These associations were the strongest within each of the models, highlighting the pressures and consequences of this developmental period. Siblings may be a protective factor within female-female dyads; personal perceived
warmth levels lowered stress and thus would lower personal levels of depression, demonstrating a partial mediation. Females typically rely on emotional exchanges to cope with stress (Eaton & Bradley, 2008), and by having a close sister, they may have an easily accessible resource to share their emotions and lower their stress levels and subsequently their depressive symptoms. Within female male dyads, the partial mediation differs; sibling warmth levels increase personal stress and thus increase personal depression. This partial mediation lends more support that close mixed gender dyads may be especially vulnerable to the changes within sibling relationships during emerging adulthood.

Although several significant associations did emerge, the study itself has several limitations. First, the sample was relatively homogenous; most participants were white, highly educated at the same university, and came from two parent homes, which is not representative of the population of emerging adults. Secondly, there was a lack of male-male dyads (n = 10) within the study, leading to the elimination of this subsample within the final analyses presented here. Additionally, the current study only examined the sibling relationship closest in age, which may have ignored other sibling relationships. One of the largest limitations was the measures used to examine separateness and connectedness, which appear to have limited validity. Several items within the separateness and connectedness scales were constructed using multiple clauses, (i.e. even though we are close, I can be myself) which may have confused participants, leading them to answer differently than they would have if the items were simplified (I can be
myself with my mother). This lack of validity may have contributed to the models’ lack of fit, which further limits the study presented.

Even though there were measurement and sampling limitations, the study highlights future areas of investigation. Warmth is only one dimension of sibling relationships; future research should investigate other facets of sibling relationships such as conflict and competition in relation to individual outcomes, especially during what may be the turbulent time of emerging adulthood. These various dimensions may interact differently based on gender and number of siblings; future research should strive to incorporate all sibling pair types (female-female, male-male, and female-male) as well as expand investigation into triadic and quadratic sibling relationships; in both cases, the impact on age differences should also be examined. Additionally, future samples should include participants of diverse ethnic backgrounds as well as various socio-economic statuses. In keeping with a more diverse sample, personal characteristics of the individuals within the sibling pair should be investigated such as sexuality of the siblings to determine if personal characteristic influence sibling relationships. The role and influence of the family of origin experience needs to be further investigated, especially since the influence of the parental and marital relationship on sibling relationships in early childhood is well established (Feinberg, McHale, Crouter, & Cumsille, 2003; Furman, 1995) and there is emerging evidence of sustained influence during emerging adulthood (Milevsky, 2005). Future research should also investigate the triadic relationship between siblings and each of the parents.
This study began to investigate the relationship between family of origin characteristics and sibling relationships and how these relationships influence individual outcomes during emerging adulthood. The results highlight the uniqueness of the gender make up of the sibling pair as well as the protective factors within sibling dyads. With continued investigation into these sibling relationships, interventions may be developed and implemented within emerging adulthood environments, such as college and universities as well as community centers, to increase the quality of these relationships and thus improve the mental health outcomes for the individuals within them. With improved mental and relational health within these individuals, society as a whole may reap the benefits of a healthier, happier, and more productive generation which can carry these positive outcomes into future generations.
References


Appendix A: Figures
Figure 1. Final Confirmatory Factor Analyses

Note. Separateness is abbreviated to Sep. and connectedness is abbreviated to Con. Fit for the separateness model was $\chi^2(8) = 12.863, p < 0.117$, RMSEA = .092, CFI = .958, TFI = .891. Fit for the connectedness model was $\chi^2(8) = 21.35, p < 0.006$, RMSEA = .152, CFI = .938, TFI = .837. The fit for the warmth model was $\chi^2(8) = 7.999, p = 0.434$, RMSEA = .00, CFI = 1.00, TFI = 1.00. Con. stands for Connectedness; Sep. stands for Separateness; Em. Stands for Emotional.
Figure 2. Separateness APIM

Note. $\chi^2(df)$ 306.81 (215) $p < 0.001$, RMSEA = 0.116, CFI = 0.84, TLI = 0.82. Sibling 1 is abbreviated to S1 and Sibling 2 is abbreviated to S2. Separateness is abbreviated to Sep and Depression is abbreviated to Dep. Letters indicate equality constraints placed on the pathway.
Figure 3. Connectedness APIM

Note. \( \chi^2(df) = 341.33 \ (215) \ p < 0.001 \), RMSEA = 0.137, CFI = 0.81, TLI = 0.79. Sibling 1 is abbreviated to S1 and Sibling 2 is abbreviated to S2. Connectedness is abbreviated to Con and Depression is abbreviated to Dep. Letters indicate equality constraints placed on the pathway.
Appendix A: Tables
### Table 1. APIM results for Separateness Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Female-Female Dyads</th>
<th>Female-Male Dyads</th>
</tr>
</thead>
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<td></td>
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<td><strong>S1</strong></td>
<td></td>
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<tr>
<td>Separateness</td>
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<tr>
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<td>0.08</td>
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</tr>
<tr>
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<tr>
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</tr>
<tr>
<td>S2 Depression</td>
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<td>0.56</td>
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<tr>
<td><strong>S2</strong></td>
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<td></td>
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<tr>
<td>Separateness</td>
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<td>S1 Warmth</td>
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<td>0.14</td>
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<td>0.08</td>
</tr>
<tr>
<td>S1 Stress</td>
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<td>0.56</td>
</tr>
<tr>
<td>S2 Depression</td>
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<td>0.58</td>
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</table>

Note. χ²(df) 306.81 (215) $p < 0.001$, RMSEA = 0.116, CFI = 0.84, TLI = 0.82. Sibling 1 is abbreviated to S1 and Sibling 2 is abbreviated to S2. **p < .001, *p < .05.**
Table 2. APIM Results for Connectedness Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Female-Female Dyads</th>
<th>Female-Male Dyads</th>
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</thead>
<tbody>
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<tr>
<td>S1 Depression</td>
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<td>S2 Depression</td>
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<td><strong>S2 Stress</strong></td>
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Note. $\chi^2$(df) 341.33 (215) $p < 0.001$, RMSEA = 0.137, CFI = 0.81, TLI = 0.79. Sibling 1 is abbreviated to S1 and Sibling 2 is abbreviated to S2. ***$p < .001$, *$p < .05$. 