

THESIS

SIBLING RELATIONSHIPS AND THE CAMPUS CONNECTIONS PROGRAM

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ABSTRACT

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Campus Connections (CC) is an award-winning, therapeutic, one-on-one mentoring program created to promote the resilience and life success of youth (Haddock et al., 2020; Weiler et al., 2015). The robust existing literature on the positive impact of CC demonstrates a need to identify other factors that can continue to improve outcomes for youth. This study looks at the impact of sibling participation on the intended impacts of CC, specifically self-reported anxiety, self-reported depression, and self-reported belongingness within CC moderated by age gap between sibling participants. Participants included 654 youth (range = 10 to 18, 59% female, 58.2% Caucasian) enrolled in CC, with 25% of the youth having completed the program with a sibling. Results found that there was no evidence for significant differences in change in key outcomes (anxiety, depression, belongingness in CC) based on whether youth participated with a sibling within this study. Age gap between siblings was also not a significant moderator of these associations. While this study was limited based on its use of mostly self-report measures and change being only considered via immediate pre-test post-test differences, the results imply that sibling relationship quality may matter more than merely the participation of a sibling within CC.

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INTRODUCTION

An individual's relationship with their sibling is the longest relationship they may have in their lifetime (Buist et al., 2013; Davies, 2014; Whiteman et al., 2011). Despite the significance of sibling relationships, the existing literature on siblings' influences on one another's behavior is limited compared to the robust body of research on parent-child relationships. Bronfenbrenner's Ecological Systems Theory informs us that daily activities are both causes and consequences of children's development (1979). Siblings spend significant time together away from the direct supervision of parents or other adults. This provides them with the opportunity to observe and reinforce one another's behavior and socioemotional development (McHale et al., 2012). Relationships Theory explains that the majority of a child's development occurs through interactions within their close relationships (Howe, 2022). Sibling relationships are an important influence on childhood developmental outcomes and a context for developing understanding of the social world (Howe, 2022). There is a clear pattern in past research that having a secure attachment to one's sibling has significant effects on the development of internalizing symptoms and feelings of belongingness (Baskin et al., 2010; Branje et al., 2004; Dirks et al., 2015; Hazan & Shaver, 1994; Noel et al., 2017).

Based on Ecological Systems Theory and Relationships Theory, there is evidence to suggest that sibling participation may lead to an increase in the intended benefits of a youth mentoring program, specifically affecting internalizing symptoms, and reported feelings of belongingness (Bronfenbrenner, 1979; Kazlauskaite et al., 2020; Howe, 2022; McHale et al., 2012). However, there is no evidence for this hypothesis in the current literature. The goal of this study was to test this hypothesis. This paper focuses on Campus Connections (CC), a

therapeutic, time-limited, one-on-one mentoring program (Haddock et al., 2020; Weiler et al., 2015).

A CC Overview

CC is an award-winning therapeutic mentoring program created to promote the resilience and life success of youth who have experienced multiple adversities through strengthening social bonds, increasing academic engagement and performance, decreasing substance use and delinquency, and improving sense of self (Haddock et al., 2020; Weiler et al., 2015). CC is campus-based, licensed, youth mentoring program that operates on five campuses worldwide, and uses a one-on-one mentoring model that pairs college student mentors with youth mentees (Haddock et al., 2020; Weiler et al., 2015). In an evaluation conducted on CC in 2015 by Weiler and colleagues, CC participants reported lower frequency of problem behaviors than the comparison group. These findings contributed to the growing body of literature emphasizing the importance of the mentoring relationship for mitigating poor outcomes for youth. According to Rhodes' (2005) model of youth mentoring, a strong emotional connection between a mentor and their mentee distinguishes youth mentoring programs associated with better outcomes from those with neutral or detrimental outcomes.

Based on this, we understand the development of a positive mentor-mentee relationship is crucial (Rhodes, 2005; Weiler et al., 2015). However, youth may view their mentor with suspicion and distrust at the beginning of the relationship (Donlan et al., 2017). Due to the extended period siblings tend to spend together, siblings are prime candidates to form primary attachment bonds with one another (Noel et al., 2017). Secure sibling relationships may foster the development of social skills in addition to providing emotional support, which may enhance adjustment at school and other programs (Buist et al., 2013; Stormshak et al., 1996). Such secure

attachment provides youth comfort in times of stress as well as a secure base from which youth can explore the world (McHale et al., 2015; Johnson, 2019; Whiteman et al., 2011). There is also evidence that individuals exhibit better social skills if raised with siblings (Yucel et al., 2017). Pulling together these lines of evidence, there is reason to expect that completing CC with a sibling may increase the youth's ability to trust their mentor by providing them a secure base to explore, therefore, increasing their ability to develop a positive relationship with their mentor and strengthen social bonds and feelings of belongingness within the program.

Belongingness in CC. Structure, positive norms, and supportive relationships bolster belonging, characteristics a program like CC displays (Kazlauskaite et al., 2020). Treatment effects of CC are strongest for youth in high quality mentoring relationships who feel a high sense of belonging (Deane et al., 2022; Kazlauskaite et al., 2020; Weiler et al., 2015). CC intentionally engages youth in a community of other mentors and mentees to develop feelings of belongingness (Haddock et al., 2020).

While there is no existing CC literature on sibling dyads, youth who reported significant mentor alliance and belonging described high-quality mentor characteristics (e.g., empathy, acceptance) and high-quality settings (e.g., positive social norms, support for efficacy and mattering) (Kazlauskaite et al., 2020). Based on this, there is reason to expect that if siblings participate in CC together it will likely increase their sense of belongingness within the program.

Sibling Attachment

The concept of attachment theory was first presented in the late 1950s by John Bowlby and Mary Ainsworth. However, the majority of Bowlby and Ainsworth's research focused on the parent-child relationship. Attachment theory exists in an attempt to understand developmental changes and individual differences in social relationships (Whiteman et al., 2011). A central

tenet of attachment theory is that seeking and maintaining contact with others is an innate and motivating force in human beings at all phases of the lifespan (Johnson, 2019). This emphasizes the idea that siblings have the capacity to develop secure attachments with one another. Notably, in 2005 Noller found that individuals are generally considered to be attachment figures if they fulfill five functions: “they are a safe haven in times of distress, function as a secure base, have a strong emotional tie with the person, seek to be in close proximity to the individual, and would mourn the loss of the person,” (p.6). More often than not, siblings fulfill these functions for one another (Noller, 2005). The secure base provided by a loving attachment figure encourages an openness to new information and promotes the confidence necessary to risk, learn, and stay curious in new environments and experiences (Johnson, 2019) such as CC.

The Effect of Sibling Relationships on Sense of Belonging

According to Hagerty, Lynch-Sauer, Patusky, Bouwsema, and Collier (1992), a sense of belonging is defined as the experience of personal involvement in an environment that causes the individual to feel like an integral part of that environment. Belongingness is an important way to understand the fundamental role of interpersonal relationships. A fulfilled sense of belonging can lead to positive emotions (Gao et al., 2017). The feeling of belongingness is “generated by the effect of the external environment on the individual, and the individual's behavior in the external environment is the result of this effect” (An & Liu, 2014, p.2). Therefore, it is possible that completing a program like CC with an individual who increases a youth's feelings of belongingness, such as a sibling, may increase the desired effects of the program.

Although the literature on the link between sibling relationships' effect on belongingness is limited, individuals with significant nuclear family belongingness appear to struggle less with loneliness (Baskin et al., 2010). In a study investigating how the quantity and quality of

interpersonal relationships affect adolescent feelings of belongingness, Chen (2003) found that feelings of belongingness to family and friends decreased adolescents' level of loneliness. Based on this, there is reason to expect that if an individual participates in a program with an attachment figure it may lead to an increase of feelings of belonging within the program.

Effects on Internalizing Symptoms

Understanding sibling attachment bonds is crucial to understanding the effect sibling relationships have on the development of internalizing behaviors, specifically anxiety and depression. The Strange Situation was a longitudinal experiment developed to observe the extent to which a young child could use their mother as a secure base to explore an unfamiliar space (Ainsworth & Bell, 1970). Stewart (1983) showed that when children were placed in the Strange Situation with a sibling, more than half of all older siblings actively cared for their younger siblings when they showed distress upon their mother's exiting. Their attempts to comfort were both accepted by their younger siblings and effective in reducing distress when there was a secure relationship between the siblings (Stewart, 1983). Attachment theory holds that a central task of development is establishment of emotional bonds (Hazan & Shaver, 1994). Because of this, sibling interactions make a unique and meaningful contribution to the development and maintenance of internalizing symptoms (Dirks et al., 2015).

McHale and colleagues found that positive sibling attachment experiences may promote healthy strategies for children and adolescents to manage and regulate their emotions, diminishing the risk for developing anxiety and depression (2012). Similarly, Buist et al. (2013) conducted a meta-analysis investigating the link between child and adolescent sibling relationship quality and internalizing problems. Their results found that more warmth and less conflict in the sibling relationship is related to fewer internalizing behaviors. Buist et al. (2013)

believed these results were explained by the process of attachment. This is likely because the quality of relationship that develops between siblings has been found to be associated with both internalizing symptomatology in children (Gass et al., 2007). In contrast, a child with insecure sibling bonds may enter new social interactions with more fear, anger, and/or mistrust, potentially leading to internalizing and externalizing problems (Hazan & Shaver, 1994).

Additionally, symptoms of depression appear to have a positive, significant relationship with sibling attachment, such that improvements in one would likely result in improvements in the other (Buist et al., 2019). Perceived support in general has been linked to adolescent adjustment, in that adolescents who perceive more support exhibit fewer internalizing behaviors (Branje et al., 2004; Noel et al., 2017). In addition, supportive sibling relationships have been linked to the development of psychosocial competence of children; sibling problem behavior is strongly related to internalizing problems (Branje et al., 2004). Therefore, participating in CC with a sibling and receiving such support from them may contribute to lower self-report scores on the anxiety and depression scales after completion of the program, compared to participants who did not complete CC with a sibling.

The Effect of Age Gap Between Siblings

According to social learning theory, children learn behaviors such as attitudes and beliefs through two key mechanisms: reinforcement and observation of others' behaviors (Bandura & Menlove, 1968). Social learning principles imply that modeling processes in sibling relationships vary as a function of the sibling dyad; siblings close in age may be imitated because of their similarity to self (Bandura & Menlove, 1968; Whiteman et al., 2011). Siblings who live in the same household have multiple opportunities each day to observe and reinforce one another's behavior. In fact, young children are more likely to observe, imitate, and consult their older

siblings than their older peers (Azmitia & Hesser, 1993). The influence of older siblings is overlooked in Western societies, however, in cultures such as Mayan Mexico and Southeast Asia, older siblings are seen as active participants in facilitating their younger siblings' socialization (Kramer et al., 2019). In addition, siblings who are close in age and are playmates may develop attachment relationships to one another because of mutual trust (Noel et al., 2017).

In a meta-analysis conducted by Buist et al. (2013) the associations between sibling warmth, sibling conflict, and differential treatment with fewer internalizing problems were all stronger for smaller age differences between siblings. For instance, the stronger association of sibling conflict with internalizing problems for sibling pairs with smaller age differences suggests that conflicts with a sibling close in age may be felt more intensely and the more strongly linked to feelings of anxiety and depression (Buist et al., 2013). Siblings closer in age are closer in developmental status and can be expected to use similarly developed cognitive and emotional tools to interpret and respond to events (Feinburg et al., 2000). In addition, siblings in adjacent positions in their family lineage are like each other in age and interests and more likely to form close relationships during childhood (Feinburg et al., 2000; Riggio, 2006). This study will test if the intended benefits of CC are further strengthened when youth participate with a sibling closer to them in age.

The Present Study

The purpose of this study is to examine the extent to which completing CC with a sibling enhances the benefits of CC, specifically decreasing symptoms of anxiety and depression and increasing feelings of belongingness from pre- to post-test. Past studies have shown that secure sibling relationships may enhance a child's sense of security in new environments and decrease internalizing symptoms such as depression and anxiety (Buist et al., 2013; Branje et al., 2004;

Dirks et al., 2015; Gass et al., 2007; McHale et al., 2015; Noel et al., 2017; Whiteman et al., 2011). However, there is a gap in terms of linking secure sibling relationships to increased benefits of youth mentoring programs like CC. I hypothesize that participating in CC with a sibling predicts greater decreases in symptoms of depression and anxiety and greater increases in feelings of belongingness compared to individuals who do not participate in CC with a sibling. I will explore whether these benefits are moderated by the age gap between the siblings, specifically, whether the benefits are greater if the age gap between the participating siblings is smaller.

METHODS

Participants

Participants were 654 individuals (59% female, 58.2% white) between ten and eighteen years old who were enrolled in the CC program at CSU. Of those 654 participants, 25% reported completing CC with a sibling. To enroll, the caregiver of the youth participants completed an online referral form for CC. Youth were also referred by the Department of Human Services. Once a youth was referred, the CC team contacted families for an hour-long intake appointment with youth and parent/guardian. The intake process included discussion of the program, expectations, goals, and other needs, paperwork, including Release of Information to referral sources, conversation about the night the youth would like to attend CC, and discussions about transportation along with selection of their mentor. Youth were matched with mentors from a selection of mentor profiles. All participants had to be able to complete measures and tasks in English or Spanish.

Procedure

This study is based on pre-existing data from six semesters of CC between the fall of 2015 to the spring of 2018. Data for this study was collected via self-report questionnaires about feelings of belongingness in CC, depressive symptoms, and anxiety symptoms. Parents also completed questionnaires at week 0 to assess baseline risk. Scores on each of these three measures were collected at week 0 (when CC had not yet begun) and then again at week 11. Week 0 and week 11 serve as pre and post-test, respectively. All procedures were approved by the Colorado State University Institutional Review Board.

Measures

Sibling Participation

This variable is based on CC records and was used as the independent variable in all analyses. Information was collected via participants self-report. Participants indicated whether they had a sibling simultaneously participating in CC (0= no, 1=yes).

Belongingness

Each participant completed the Belongingness Scale at CC measure, adapted from Youth Development Strategies Inc. and initially designed for use in a chartered Boys and Girls Club (Anderson-Butcher & Conroy, 2002). The Belongingness at CC scale consists of 5 items designed to represent the scope of an individual's beliefs that they belong at CC. Responses were made on a 11-point Likert-type scale ranging from 0 (DISAGREE!!!) to 10 (AGREE!!!). The measure was utilized at intake (k0), week 3 (k2), week 6 (k3), week 9 (k4), and week 11 (k5) of the CC program. At k0 the items were worded to capture expectations (since CC hadn't yet begun), and at each subsequent survey the items were worded to capture current experiences. Sample items include: "I feel like I will belong at CC/I belong at CC" and "I feel like my ideas will count at CC/My ideas count at CC." The Cronbach's alpha, calculated at intake and Week 11, were 0.90, 0.92, respectively. High scores indicate a higher perceived belongingness. A sum score was taken to analyze the data from this measure.

Depressive Symptoms

The Center for Epidemiologic Studies Depression Scale (CESD) is a measure of depressed mood used widely in community studies (Haroz et al., 2014). This measure has shown to have very high internal consistency, adequate test- retest repeatability, and good construct validity (Radloff, 1977). The CESD is a 9-item measure. In CC, the CESD was available at

intake (k0), week 11 (k5), and at the six-month follow-up (k6). Responses were made on a 8-point Likert-type scale on how many DAYS in the PAST WEEK have these things happened ranging from 0 (0 days) to 7 (7 days). Sample items include: “My appetite was poor” and “I lost interest in my usual activities.” The Cronbach's alpha, calculated at intake and Week 11, were 0.90 and 0.92, respectively. High scores indicate a higher frequency of depressed symptoms. A sum score was taken to analyze the data from this measure.

Anxiety

The Children’s Manifest Anxiety scale is a measure used to help mental health professionals identify children and adolescents who may be experiencing thoughts and feelings consistent with anxiety disorders (Gurley, 2011). This scale is a 10-item self-report measure of anxiety for children and adolescents between the ages of 6 and 19. In CC, this measure is available at intake (k0), week 11 (k5), and at the six-month follow-up (k6). Participants responded to each question with either 1 indicating “yes” or 0 indicating “no”. Sample items include: “I fear other kids will laugh at me in class” and “Often I feel sick in my stomach.” The Cronbach's alpha, calculated at intake and Week 11, were 0.85 and 0.88, respectively. High scores indicate a higher frequency of anxiety symptoms. A sum score was taken to analyze the data from this measure.

Moderator: Age Gap

The age gap between the sibling pairs is a moderator within this study. Youth age is self-reported by the participants during the intake process. A variable will be created representing the number of years between the birth of the older and the younger sibling.

Control Variables

Variables significantly associated with the independent and the dependent variables will be included as control variables in an effort to rule out confounds. Demographic variables and baseline risk were considered as potential control variables.

Demographics. At intake, participants were asked to answer specific questions about their demographics, such as mentee's self-reported race/ethnicity. Caregivers also included a report of the mentee's race/ethnicity if different from what the mentee had selected. Responses for both questions ranged from (1=American Indian, 2=Asian, 3=Black, 4=Hispanic, 5=Hawaiian, 6=White, 7=Mixed). Mentees were also asked about their biological sex and their gender. In terms of biological sex, the response options were 1 (Boy) to 1 (Girl). For individuals that do not identify as exclusively a boy or girl, their biological sex was imputed for *mentee_male*. Cases are noted in the *imprnotes* variable. For mentee gender, the response options were 1 (Boy), 2 (Girl), and 3 (Other).

Baseline Risk. This risk assessment measure was created as a part of a study to examine how risk may influence youth's relationships with their mentors (Herrera et al., 2013). This 32-item instrument was completed by parents of CC participants during the intake process. Parents of participants responded to each question with either 1 indicating "yes" or 0 indicating "no". Sample items include: "in the last 12 months, there have been times when the child's family hasn't been able to pay bills" and "this child doesn't have any close friends at school or in the neighborhood." The Cronbach's alpha, calculated at intake, was 0.72. High scores indicate a greater baseline risk. A sum score was taken to analyze the data from this measure.

Data Analysis Plan

The independent variable for this study is whether the individual completed the CC program with a sibling. The dependent variables are change (calculated via difference scores) in

the self-reported levels of anxiety symptoms, self-reported levels of depression symptoms, and self-reported feelings of belongingness within the CC program. Levels at week 0 will be subtracted from levels at week 11 to create difference scores. Demographics (gender, ethnicity) and baseline risk will be examined as potential confounding variables; if either of these variables are significantly associated with both the independent variable and one of the dependent variables they will be included as control variables in the main analyses. Preliminary analyses will be completed to compute descriptive statistics (M , SD) for each study variable, including gender, age, sibling age gap, and ethnicity. To test the hypothesis, three regressions will be used to compare the independent variable to each of the three dependent variables. To assess moderation, the analyses will be restricted to those who are participating with a sibling and then another set of regressions will be completed, adding the age gap variable as a predictor.

RESULTS

Bivariate Correlations

Initial analysis of descriptive statistics and a correlation matrix including all variables (see Table 1) was run. Non-significant associations between all key variables and participating in CC with a sibling were trivial: anxiety at baseline, anxiety at week 11, depression at baseline, depression at week 11, belongingness at CC at baseline, and belongingness at CC at week 11. There was no significant bivariate association between participating in CC with a sibling and any other measured variable. However, regarding the key study variables, as to be expected, there was a significant positive association between anxiety at baseline and week 11, depression at baseline and week 11, and belongingness at baseline and week 11. In addition, the outcomes (anxiety, depression, and belongingness) were significantly associated with each other, and in expected directions. There were also several significant associations between the key and control variables. Participants who identified as non-male had significantly higher self-reported anxiety, higher depressive symptoms, and lower belongingness at baseline and week 11. In addition, participants who identified as white had significantly higher self-reported depressive symptoms at week 11. Furthermore, baseline risk was significantly and positively associated with anxiety at baseline as well as depression at both baseline and week 11. Finally, baseline risk was significantly and negatively associated with belongingness at baseline.

The Association Between Sibling Participation in CC and Change in Self-Reported Anxiety, Depression, and Belongingness within CC

Next, three regressions were run to investigate the main effects of sibling participation, one for each outcome (anxiety, depression, and belongingness; see Table 2). There was no

significant difference in change in anxiety, depression, or belongingness based on participating in CC with a sibling.

However, there was a significant, positive association between baseline risk and change in belongingness, such that those with greater baseline risk also showed greater increases in belongingness from baseline to posttest. The other control variables within this study, participant gender and ethnicity, were not found to be significantly related to belongingness.

The Association Between Age Gap and Change in Self-Reported Anxiety, Depression, and Belongingness within CC

Finally, to investigate the extent to which the effects of participating with a sibling were moderated by age gap, I ran three regressions, one for each outcome, within the subsample of participants who participated with a sibling (see Table 3). There was no significant association between the age gap between siblings and change in anxiety, depression symptoms, or feelings of belongingness within CC.

However, there was a significant difference in depression based on race/ethnicity, such that participants who identified as white showed a significantly greater increase in depression from baseline to posttest within the subsample. Baseline risk, the other control variable within this study, was not found to be significantly related to depression.

DISCUSSION

The goals of this study were to examine the extent to which completing Campus Connections (CC) with a sibling enhanced the intended benefits of the program, specifically anxiety, depression, and belongingness, while also evaluating whether age gap between siblings moderated that association. Despite a clear pattern in past research of a secure attachment to one's sibling having significant effects on the development of internalizing symptoms and feelings of belongingness (Baskin et al., 2010; Branje et al., 2004; Dirks et al., 2015; Hazan & Shaver, 1994; Noel et al., 2017), this study did not find evidence for significant differences in change in key outcomes based on whether youth participated with a sibling. Age gap between siblings was also not a significant moderator of these associations. These findings suggest that simply participating in a mentoring program with a sibling is not sufficient enough to increase the intended benefits of the program.

Internalizing Symptoms and Belongingness

In contrast to past evidence that sibling interactions make a unique and meaningful contribution to the development and maintenance of internalizing symptoms by helping siblings work together to manage and regulate their emotions (Dirks et al., 2015; McHale et al., 2012), and that feelings of belongingness to family and friends decreased adolescents' level of loneliness (Baskin et al., 2010; Chen, 2003), there was no evidence that participating in CC with a sibling was associated with a greater change in internalizing symptoms or belongingness from before to after CC. Sibling relationship quality is characterized by high levels of warmth, closeness, and problem solving as well as low levels of antagonism, conflict, and detachment; these quality indicators are consistent predictors of better psychological adjustment in childhood

and adolescence (Buist et al., 2013; Howe et al., 2015; Whiteman et al., 2012). It is possible that sibling relationship quality may matter more than merely the participation of a sibling within CC.

The quality of relationship that develops between siblings has been found to be associated with both internalizing symptomatology in children (Feinburg et al., 2013; Gass et al., 2007). In contrast, a child with insecure sibling bonds may enter new social interactions with more fear, anger, and/or mistrust, potentially leading to internalizing and externalizing problems (Hazan & Shaver, 1994). In the context of this study, participating in CC with a sibling might only matter in the context of quality. Based on the literature around sibling relationship quality, participating in CC with a sibling might be beneficial if the sibling relationship is high quality, but participating with a sibling with whom you have a poor-quality relationship could be neutral or maybe even damaging. As this study was conducted using a secondary data set, no measure of sibling relationship quality was available.

Age Gap

Contrary to past findings that the association between sibling conflict and internalizing symptoms was found to be stronger in sibling pairs with smaller age differences, likely due to the observation that siblings in adjacent positions in their family lineage are more likely to form close relationships during childhood (Buist et al., 2013; Feinburg et al., 2000; Riggio, 2006), there was no evidence that the age gap of siblings participating in CC moderated the possible association between key outcomes and whether youth participated with a sibling. It is possible that only looking at age gap in this study, rather than gender of siblings or impact of birth order, lead to non-significant findings.

In terms of the impact of societal norms on sibling relationships, first-born siblings tend to engage in leadership and teaching roles, whereas second-born siblings are more likely to

imitate, follow and be a learner (Howe & Recchia, 2006). Therefore, it is possible that looking at the impact of CC on first born and second born siblings separately could have yielded different results. On the topic of gender, in a study conducted in 2011 by Van Volkom and colleagues considering sibling gender, birth order, and age spacing, female participants were more likely than male participants to turn to the sibling when they are experiencing difficulties in life. Looking at the impact of sibling gender within the study could have also been another way to conceptualize the possible positive impacts of completing CC with a sibling. In addition, past literature tells us that the relationships between siblings change throughout the lifespan (Van Volkom et al., 2011). Literature on sibling relationships has found that middle childhood-aged siblings spend more of their free time with each other than with parents or friends (Feinburg et al., 2013). Comparatively, during adolescence, siblings tend to experience distance and strain in their relationships with one another (Myers & Bryant, 2008a). As the majority of the CC participant population is in early to mid-adolescence, it would make sense why the results were not as strong as hypothesized.

Baseline Risk and Ethnicity

It was not a key goal of this study to investigate differences in change based on baseline risk or ethnicity. However, results indicated a significant, positive association between baseline risk and change in belongingness, such that those with greater baseline risk also showed greater increases in belongingness from baseline to posttest. In a study that considered how risk influenced the benefits of a youth mentoring program, level/type of risk was not found to impact the intended benefits for participants (Herrera et al., 2013). Meaning, youth with differing risk experiences reported similar relationships with their mentor and similar benefits from the program (Herrera et al., 2013). Conversely, a 2019 study conducted by Weiler and Taussig

focused on whether the effect of a mentoring program was moderated by children's baseline risk. This study found the number of adverse childhood experiences (ACEs) that children were exposed to impacted the benefits of the program, such that, children with high numbers of ACEs did not experience the same reduction in trauma symptoms at the completion of the program compared to participants who had experienced fewer ACEs in their life (Weiler & Taussig, 2019). These mixed results may be due to the broad definition what is considered as “risk;” studying the role of specific youth characteristics or experiences that may provide more consistent results across studies (Browne et al., 2022). The findings in terms of baseline risk in this study align with past research suggesting that baseline risk may impact the intended benefits of youth mentoring programs.

Secondly, results suggested a significant difference in change in depression based on race/ethnicity, such that participants who identified as white showed a significantly greater increase in depression from baseline to posttest within the subsample compared to participants who identified as non-white (Table 3). Similar studies on the impact of youth mentoring programs found that program effects did not vary significantly depending on a range of characteristics including youth’s race/ethnicity (Herrera et al., 2013). Similarly, in a meta-analyses of youth mentoring programs, there was no evidence of differential impacts based on race or SES (DuBois et al., 2011; Raposa et al., 2019). However, more research is needed on the impacts of race matching in youth mentoring programs to better understand how mentors and mentees determine which inequalities are influential in their relationship (Hoffman et al., 2018). While the results of this study do not align with current literature, the field is working towards increasing understanding of the impact of race/ethnicity on mentor-mentee pairs.

Limitations & Future Directions

The current study has several important limitations to note. First, considering instrument-based limitations, the majority of measures utilized in this study were based on self-report, which can be biased. Second, change was also only considered via immediate pre-test post-test differences; longer-term change was not accounted for. Relationships between siblings change throughout the lifespan (Van Volkom et al., 2011). Having an awareness of longer-term change could have provided more nuanced insight into the possible impact of sibling relationships within CC.

Other possible limitations of this study included lack of specific operationalization of the sibling variable within the data set. Whether siblings were related biologically, or through the foster or adoption system, was not specified in the data. Opting not to include a measure of sibling relationship quality was another limitation throughout this study and could be a productive focus of future empirical research within CC.

CONCLUSION

This study found no evidence for a significant association between sibling participation in CC and an enhancement of the benefits of CC, nor was age gap between siblings found to moderate this association. An individual's relationship with their sibling is the longest relationship they may have in their lifetime, in fact, children in the U.S. are more likely to live in a household with a sibling than with a father (McHale et al., 2012). The literature suggests that the significant time siblings spend together away from the direct supervision of parents or other adults provides them with the opportunity to observe and reinforce one another's behavior and socioemotional development (McHale et al., 2012). However, simply participating in a mentoring program with a sibling does not seem sufficient to impact the intended benefits of the program.

TABLES

Table 1
Descriptive Statistics for Correlations between Main Variables of Interest

	1	2	3	4	5	6	7	8	9	10	11
1. Sibling Participation ^a	X	N/A ^b									
2. Age Gap between siblings	N/A ^b	X									
3. Anxiety at Baseline	-0.04	0.03	X								
4. Anxiety at Week 11	0.03	-0.04	0.66***	X							
5. Depression at Baseline	-0.06	0.00	0.52***	0.42***	X						
6. Depression at Week 11	-0.03	0.02	0.44***	0.53***	0.61***	X					
7. Belonging at Baseline	-0.04	-0.03	-0.16***	-0.20***	-0.27***	-0.29***	X				
8. Belonging at Week 11	-0.04	-0.09	-0.09*	-0.14***	-0.19***	-0.29***	0.45***	X			
9. Baseline Risk	-0.07	0.09	0.09*	0.06	0.18***	0.14**	-0.15***	-0.07	X		
10. White ^c	-0.02	-0.02	0.05	0.08	0.06	0.13**	-0.02	0.02	-0.05	X	
11. Male Sex ^d	-0.06	0.06	-0.35***	-0.29***	-0.27***	-0.21***	0.07*	0.01	0.01	0.00	X
<i>M</i>	0.24	1.86	3.82	3.30	17.19	15.07	6.95	8.45	7.16	0.59	0.58
<i>SD</i>	0.43	1.26	3.11	3.22	15.34	15.22	2.29	2.06	4.06	0.49	0.49

* $p < .05$ ** $p < .01$ *** $p < .001$

^a Participated in CC without a sibling = 0, Participated in CC with a sibling = 1, ^b N/A due to only siblings having an age gap,

^c White = 1, Non-white = 0, ^d Male = 1, Non-male = 0

Table 2*Regression Coefficients of Sibling Participation in CC on Self-Reported Anxiety, Depression, and Belongingness*

	Anxiety			Depression			Belongingness		
	<i>b</i>	β	<i>SE</i>	<i>b</i>	β	<i>SE</i>	<i>b</i>	β	<i>SE</i>
Sibling Participation ^a	0.392	0.065	0.262	1.089	0.035	1.357	0.076	0.015	0.219
Baseline Risk	-0.004	-0.006	0.030	-0.239	-0.067	0.156	0.078**	0.132	0.025
White ^b	0.243	0.045	0.232	0.839	0.030	1.206	0.142	0.031	0.195
Male Sex ^c	0.032	0.006	0.233	0.450	0.016	1.210	-0.308	-0.067	0.195

+ $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$

Note. N = 654. ^a Participated in CC without a sibling = 0, Participated in CC with a sibling = 1. ^b White = 1, Non-white = 0, ^c Male = 1, Non-male = 0

Table 3

Regression Coefficients of Sibling Participation in CC on Self-Reported Anxiety, Depression, and Belongingness Considering the Moderator, Age Gap in Subsample who Participated with a Sibling

	Anxiety			Depression			Belongingness		
	<i>b</i>	β	<i>SE</i>	<i>b</i>	β	<i>SE</i>	<i>b</i>	β	<i>SE</i>
Baseline Risk	0.109	0.157	0.059	0.288	0.079	0.310	-0.032	-0.050	0.055
White ^a	0.594	0.119	0.426	6.534**	0.250	2.213	0.051	0.011	0.390
Male Sex ^b	-0.001	-0.000	0.416	0.171	0.007	2.161	0.109	-0.024	0.382
Age Gap in Years	-0.208	-0.109	0.162	0.535	0.054	0.842	0.000	0.000	0.149

+ $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$ Note. N = 136. Only those who participated with a sibling were included.

^a White = 1, Non-white = 0, ^b Male = 1, Non-male = 0

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