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CROSS-AGE PEER MENTORING: A META-ANALYSIS

A Dissertation Presented

by

SAMANTHA BURTON

Submitted to the Office of Graduate Studies,
University of Massachusetts Boston,
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2020

Clinical Psychology Program

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CROSS-AGE PEER MENTORING: A META-ANALYSIS

A Dissertation Presented

by

Samantha Burton

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ABSTRACT

CROSS-AGE PEER MENTORING: A META-ANALYSIS

August 2020

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Youth mentoring programs are a promising intervention for youth, particularly those who experience or are at risk for developing a range of psychological, social, behavioral, and contextual difficulties. Cross-age peer mentoring is a form of formal peer mentoring that matches an older youth mentor with a younger youth mentee to promote positive youth outcomes. The current study used meta-analysis to explore the overall effectiveness of cross-age peer mentoring programs, as well as to explore moderators of cross-age peer mentoring program effectiveness. A comprehensive search of the literature published prior to April 2019 was conducted to identify evaluations of cross-age peer mentoring programs. Both computer-based and manual search methods were used to locate studies for the current analysis. Analyses included only studies that evaluated a program aimed at improving youth outcomes through a one-on-one, cross-age peer mentoring relationship in which the youth mentor was at least two years older than the youth mentee. Studies were coded for mentee, mentor, match, program, and methodological characteristics, as well as outcome characteristics. A multi-level meta-analytic approach was used to estimate the overall effect

size of cross-age peer mentoring programs, as well as to explore moderators of program effectiveness. Results found a statistically significant medium effect size of the overall impact of cross-age peer mentoring. Moderator analyses indicated several program characteristics that increase the effectiveness of cross-age peer mentoring programs, including programs that are community-based, conducted in urban settings, demonstrate moderate to high levels of adult oversight and supervision, target specific youth outcomes, and have smaller sample sizes. The results of the present study suggest that cross-age peer mentoring is a promising intervention with significant youth outcomes. Findings also suggest the importance of adequate training, supervision, and oversight for youth mentors during program implementation.

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CHAPTER 1

SPECIFIC AIMS

Youth mentoring programs are a promising intervention for youth, particularly those who experience or are at risk for developing a range of psychological, social, behavioral, and contextual difficulties. Youth mentoring is often thought of, discussed, and researched in the context of pairing adult mentors with youth mentees. While relationships with adults can certainly be significant in their impact on youth, many researchers also point to the impact of peer relationships on youth development.

Cross-age peer mentoring is a form of formal peer mentoring that matches an older youth mentor with a younger youth mentee. Recent research has highlighted some positive impacts of one-on-one cross-age peer mentoring relationships for youth. Mentees have shown improvement in domains such as misbehavior and misconduct, academic skills and attitudes, and socioemotional well-being (Karcher & Berger, 2017). However, findings are mixed across various studies, with some evaluations finding little to no benefit in these areas. This can be partially explained by the variability in program structure across cross-age peer mentoring programs and a lack of focus in the literature on which aspects of these programs are most effective. While past meta-analyses have examined the impact of adult-youth mentoring relationships, the effectiveness of cross-age peer mentoring in youth has not been examined through meta-analysis. Meta-analyses yield more precise and reliable estimates of the overall impact of mentoring compared to individual evaluations and allow for comparisons of impact across a variety of mentor, mentee, match, program, and methodological characteristics.

The current study aims to address the gap in the existing literature by conducting a comprehensive meta-analysis of all experimental and quasi-experimental cross-age peer mentoring evaluations written in the English language. The current study will focus on one-on-one mentoring programs that match an older youth (the mentor) with a younger youth (the mentee). Programs will only be included if mentors and mentees have a difference of two or more years in age, per Karcher and Berger's (2017) definition of cross-age peer mentoring. The findings from the current meta-analysis will inform the literature on interventions that aim to promote positive youth development and will highlight the impact of older youth on younger youths' outcomes. This study aims to (1) examine the overall effectiveness of cross-age peer mentoring programs, (2) examine the effectiveness of cross-age peer mentoring programs across different categories (psychological, social, cognitive, health, school) of youth outcomes, (3) examine moderators of effectiveness of cross-age peer mentoring programs, including mentor, mentee, program, and methodological characteristics, and (4) test the role of publication bias in the calculated overall effect size.

CHAPTER 2

BACKGROUND AND SIGNIFICANCE

Youth mentoring programs are a promising intervention for youth, particularly those who experience or are at risk for developing a range of psychological, social, behavioral, and contextual difficulties. Mentoring relationships can vary widely, but most are characterized by close and trusting connections that promote mentees' psychological, behavioral, academic, and occupational outcomes. These connections can be informal, or natural, mentoring relationships, occurring between caring, nonparent adults and younger mentees, or can be formal mentoring relationships, when youth and mentors enroll in a program and are matched by program staff.

Natural mentoring bonds arise organically, within existing social networks, rather than within a formal matching program, and tend to be closer and longer-lasting. Approximately half of all informal mentors are family members (e.g., siblings, aunts, uncles, grandparents), while a quarter are teachers or guidance counselors. Other relatively common informal mentors include coaches, religious leaders, employers, neighbors, and friends' parents (Dubois & Silverthorn, 2005a). Research shows that informal mentors can serve a range of functions for youth, including emotional support, advocacy, social networking, advice-giving, material and financial support, friendship, and role modeling (Dubois & Silverthorn, 2005b; Miranda-Chan et al., 2016). Unfortunately, shifting marital patterns, community disintegration, overcrowded schools, and increasing residential and educational segregation have reduced access to informal mentors for many youth, particularly those with low socioeconomic status (SES). Furthermore, these changes limit access to mentors who

have the skills and resources to provide high quality mentorship, as well as the social capital to expand youths' opportunities.

Formal mentoring programs can increase access to mentoring relationships for youth with fewer resources, and often aim to serve "high risk" or underserved youth. Traditionally, mentors and youth meet one-on-one weekly or biweekly to engage in a range of positive, enriching activities, and occasionally meet as a group with other mentor-youth dyads. However, the frequency, structure, and content of meetings varies widely within and across programs. Throughout the match period, program staff often remain in contact with mentors to provide supervision, consultation, and case management assistance.

Youth mentoring is often thought of, discussed, and researched in the context of pairing adult mentors with youth mentees. While relationships with adults can certainly be significant in their impact on youth, many researchers also point to the impact of peer relationships on youth development. In fact, some argue that peers are more influential on youth socialization than are adults (Harris, 1998).

There is a growing field of literature that focuses on the positive impact of peer relationships, particularly when interactions are carefully and thoughtfully structured by adults. Research shows benefits of peer interventions for drug use prevention (Black, Tobler, & Sciacca, 2009), peer interventions for aggressive and antisocial behavior (Gibbs et al., 1996), peer counseling (Hamburg & Varenhorst, 1972), and peer tutoring (Hofstadter-Duke & Daly, 2011). Peer helping interventions can show benefits for youth behavior, self-esteem, academic achievement, and peer relationships (Dennison, 2000).

Peer mentoring, a long-term, program-based, developmental relationship, is another avenue through which youth can positively impact their peers. Peer mentoring interventions

aim to promote mentees' development through support, guidance, and interventions that encourage positive outcomes such as enhanced connection to school, improved relationships, and acquisition of attitudes and skills that aim to promote social, academic, psychological, and behavioral well-being (Karcher, 2005).

Cross-Age Peer Mentoring

Cross-age peer mentoring is a form of formal peer mentoring that matches an older youth mentor with a younger youth mentee. Given the separation of youth by grade, there are fewer opportunities, outside of sibling relationships and multi-grade extracurricular activities, for younger and older youth to form natural mentoring relationships that allow older youth to provide guidance and support to younger youth. Formal cross-age peer mentoring programs provide a structured avenue through which to establish these relationships, which aim to benefit both younger and older youth. The age difference is thought to fulfill several roles similar to adult-youth mentoring relationships – the peer mentor serves as a role model, as well as a provider of support and guidance. The age difference allows the mentor to be "older and wiser," someone the mentee can look up to and admire. The term "peer" is included in the phrase "cross-age peer mentoring" to convey that the relationship includes two individuals within the same generation, thereby differentiating the relationship from an intergenerational one (Karcher, 2005). Typically, cross-age peer mentoring programs are established in schools or in the community, with high school mentors matched with elementary or middle school mentees. It is difficult to determine the prevalence of cross-age peer mentoring programs, as they are often coordinated by school personnel, and are not connected to outside agencies that track and report their outcomes (Karcher, 2005). Given the developmental level and maturity of the adolescents taking on the mentoring roles, cross-age

peer mentoring programs tend to involve significant adult supervision and structure, including planned activities and topics of conversation, at times within a larger group context. This structure allows for the scaffolding of youth mentors' abilities and needs.

School-based mentoring (SBM) programming has continued to grow and expand in part because of the use of high schoolers as mentors. Using high school mentors is appealing due to the potential benefits for both mentors and mentees, the ease in recruiting and training high school mentors, and high school students' abilities to connect with younger youth (Cavell et al., 2018). However, there are mixed findings on the effectiveness of high school students as mentors (Herrera et al., 2008; Karcher, et al. 2002; Karcher, 2005). Despite this, researchers remain hopeful about the use of high school mentors in cross-age peer mentorship and highlight the importance of effective mentor training and continued support throughout the match, as well as increased structure around mentor-mentee interactions (Herrera et al., 2008; Parra et al., 2002).

Recent research has highlighted some positive impacts of one-on-one cross-age peer mentoring relationships for youth. Mentees have shown improvement in domains such as misbehavior and misconduct, academic skills and attitudes, and socioemotional well-being (Karcher & Berger, 2017). However, findings are mixed across various studies, with some evaluations finding little to no benefit in these areas. This can be partially explained by the variability in program structure across cross-age peer mentoring programs and a lack of focus in the literature on which aspects of these programs are most effective. While adult-youth mentoring programs have grown in popularity as a strategy for intervening with youth at-risk for a variety of problems (Blakeslee & Keller, 2012), less is known about the impact of cross-age peer mentoring programs and how to best implement effective peer mentoring

interventions. Important questions remain about the extent to which cross-age peer mentoring interventions influence mentee outcomes and the conditions under which they are most effective.

While past meta-analyses have examined the impact of adult-youth mentoring relationships, the effectiveness of cross-age peer mentoring in youth has not been examined through meta-analysis. Meta-analyses yield more precise and reliable estimates of the overall impact of mentoring compared to individual evaluations and allow for comparisons of impact across a variety of mentor, mentee, match, program, and methodological characteristics. Meta-analysis can answer questions such as, are cross-age peer mentoring programs more effective for certain subsets of youth? Does the amount of adult oversight for youth mentors impact outcomes? Is mentoring impact affected by the length of the mentoring program? Answering these types of questions is important for determining the overall effectiveness of cross-age peer mentoring programs and will have implications for policy and practice. The current study aims to address the gap in the existing literature by conducting a comprehensive meta-analysis of all experimental and quasi-experimental cross-age peer mentoring evaluations written in the English language. The current study will focus on one-on-one mentoring programs that match an older youth (the mentor) with a younger youth (the mentee). Programs will only be included if mentors and mentees have a difference of two or more years in age, per Karcher and Berger's (2017) definition of cross-age peer mentoring. The findings from the current meta-analysis will inform the literature on interventions that aim to promote positive youth development and will highlight the impact of older youth on younger youths' outcomes.

Theories of Peer Influence

Research demonstrates that peer interactions in childhood have both short- and long-term developmental effects (Nelson & Dishion, 2004; Snyder et al., 2005). Peer relationships are particularly influential given the amount of time peers spend together, which, by early childhood, exceeds the amount of time youth spend with their parents (Ellis et al., 1981; Santrock, 2019). The literature on peer relationships points to the potential of both positive and negative impacts of peer interactions on attitudes and behavior.

The case for cross-age peer mentoring is supported by Vygotsky's (1978) theory of development, the zone of proximal development, which refers to the phenomenon that youth can reach a higher level of skills development and perform more complex cognitive, behavioral, and emotional tasks when working with or under guidance from those older than themselves. Youth engagement in shared activities and meaningful conversations with more sophisticated thinkers provides scaffolding to advance cognitive skills (Rogoff, 1990). Often this model is discussed in relation to the impact of adult-youth interactions on advancing youth learning and development. However, Vygotsky's model also points to the benefits youth gain in interaction with older peers, who can model and support skill-building and learning, and to whom youth can look up as they practice new roles and skills.

Other researchers similarly emphasize the significant impact of children's peers on their development, arguing that peers have a primary influence on youth social and cultural development. Harris' (1995) "group socialization theory" suggests that children identify with a peer group and adapt their own behavior to fit in with the behavioral norms of the group. Further, peer groups distinguish themselves from other groups, assume different norms, and perceive themselves as similar to their ingroup and different from members of outgroups.

Harris points to a variety of developmental (e.g. academic and behavioral), personality, and cultural outcomes resulting from children's identification with and participation in certain peer groups. Harris argues that, while adults influence children's opportunities and contexts, they are less influential than peers because of children's desire to be like the older kids – to speak, act, and look like them. She posits that youth do not have this same relationship to adults, and in fact adopt style, speech, and behavior that specifically distinguishes them from adults. These factors make older peers powerful influencers on youth development (Harris, 1998). Harris (1995) distinguishes peer group influences from other environmental influences and from heredity, pointing to research from Kindermann (1993) that indicates how peer group membership significantly influences attitudes toward schoolwork. She also brings in an evolutionary perspective, presenting the emotional importance of group membership for survival and the significant impact of peer influence on healthy development. Her conclusion – that children's development is significantly impacted by their membership in and identification with a social group – points to the importance of peer influence and the potential to capitalize on this influence to promote positive youth outcomes.

Kohut and Wolf (1978) posit a "self-psychology" model of psychosocial development to explain how mentoring relationships can facilitate positive youth outcomes. Their model, placed within the cross-age peer mentoring framework, can help explain variation in youth outcomes. From a "self-psychology" perspective, effective, transformative mentorship provides mentees with two distinct sets of experiences. The first experience relates to the closeness of the mentoring relationship: mentors attend to mentees' needs through empathic understanding and provision of praise, leading to increased mentee perceptions of social

support from their mentor. These increases in social support contribute to increases in mentee self-esteem and positive behaviors. The second experience relates to the structure of the mentoring relationship leading to the idealization of the mentor: mentors who show up consistently, are realistic regarding mentee goals and expectations, and who structure positive discussions and activities will have mentees who respect, value, and look up to them. As a result, mentees will experience improved connection with other authority figures (e.g., parents and teachers), enhanced interpersonal skills, and, consequently, increased confidence and academic success. The basis for expecting that positive mentoring relationships can improve youths' other relationships is derived largely from attachment theory, which theorizes that children construct cognitive representations of relationships through early experiences with caregivers, which then influence their interpersonal behavior (Bowlby, 1988). Although these working models of attachment are relatively stable over time, they may adapt in response to changes such as engagement in supportive relationships (Belsky & Cassidy, 1994; Santrock, 2019).

This self-psychology model and two core experiences included within it may explain the variation in cross-age peer mentoring program outcomes. Kohut and Wolf (1978) outline the importance of the mentee experiencing empathy, praise, and attention, as well as experiencing a consistent and positively structured relationship that leads them to identify with the mentor as an idealized authority figure. However, not all adolescents may be able to express high interest in a younger mentee or practice high-level cognitive and perspective taking skills (Adler, 1964; Selman, 1980). Less mature adolescent mentors may not be able to provide the first experience (i.e. expressing social interest and empathy) to their mentees.

Despite this, older peers may be uniquely situated to provide the second core experience: providing a relationship within which the mentee can value, respect, and idealize the mentor. Youth may be able to greater identify with and look up to older peers compared to adults, since younger youth already look to older youth for guidance on how to speak, act, and dress (Harris, 1998). Youth are not looking to gain the status and maturity of adulthood; rather they are looking to older youth as models of who they want to emulate and ultimately become. Further, while adults possess authority based on age and position, older youth provide younger youth with a sense of psychological safety and a social network (Smith, 2011). The idealization of older youth by younger youth, when younger youth are paired with older peer mentors with the capabilities to empathize and perspective-take, could uniquely satisfy Kohut and Wolf's (1978) conditions for effective and transformative mentoring relationships that facilitate positive youth development.

The argument for cross-age peer mentors is further strengthened by a phenomenon called conventionality, which highlights the role of adult and youth conventional and unconventional beliefs and behaviors in relation to youth behavioral outcomes (Hirschi, 1969; Jessor & Jessor, 1977). Adults tend to reward adult-oriented conventional beliefs and behaviors, which generally promote future-oriented and adult-dominated contexts, such as school. When youth structure their own behaviors, they often do so in opposition to adult conventions. Cross-age peer mentoring offers the opportunity to reward prosocial attitudes and behaviors through older peer modeling and support. When conventions come from older peers, they are less likely to be met with the same resistance as with adults. However, it is important for youth mentors to hold these conventions if they are to be expected to pass them along to their mentees. Youth who report greater school and family connectedness, as well as

future oriented conventions, may be more successful mentors, as they can model and reward desired behaviors.

Despite the potential for positive influences of peer-mentoring, there are also risks. One argument against the utilization of youth as mentors is that youth may not be sufficiently mature to mentor younger peers, in terms of both emotional and cognitive development. However, research on older sibling relationships demonstrates positive impacts on younger siblings' cognitive and social development. Older siblings can provide support and empathy to younger siblings, providing a context for exploration of family and other issues and modeling important skills such as perspective-taking and empathic understanding (Brody et al., 2003; Tucker et al., 2001; Howe & Ross, 1990). Yet, not all youth have older siblings to provide this modeling. Cross-age peer mentors could fill this gap, providing opportunities for social, behavioral, and cognitive learning (Van Lange et al., 1997).

One of the most concerning phenomena regarding peer influence is "peer contagion," the process by which peers exert mutual influence on each other in a way that negatively impacts emotional and behavioral development (Dishion & Tipsord, 2011). Peer contagion can lead to increased behavioral issues, such as aggression and drug use, and emotional difficulties, such as depression (Dishion et al. 1995; Dishion et al. 1996; Dishion et al. 1997; Stevens & Prinstein, 2005). Peer contagion can occur naturally through informal peer interactions, or can occur in formal intervention programs or educational settings. It is posited that peer contagion may result from deviancy training, wherein youth respond positively to stories and suggestions of deviant acts from their peers (Dishion & Tipsord, 2011). Psychologists have studied the negative effects of bringing together high risk youth in education and intervention programs (Feldman, 1992; McCord, 2003). However, many of

these studies lack rigorous methodologies; they rarely use randomization and are low in statistical power. The data suggest that some programs that aggregate children have harmful impacts, while others can positively impact youth (Dishion & Tipsord, 2011). In fact, meta-analyses of group interventions for youth reveal overall positive effects, and well-supervised interventions do not seem to produce negative effects overall (Dishion & Tipsord, 2011; Lipsey, 2006) Still, more research is needed that investigates the conditions under which peer contagion occurs and leads to negative youth outcomes.

Regarding intergenerational youth mentoring programs, there is some evidence of peer contagion effects. The Buddy System Program aimed to decrease the risk of youth crime and arrests among high risk youth (O'Donnell & Williams, 2013). However, researchers found that, for youth who had not been arrested before the mentoring intervention, the program significantly increased post-program arrest rates. They suggested this outcome resulted from friendships formed among participants with different levels of delinquency risk. They posited that youth who had not been arrested were negatively influenced by friendships formed with previously arrested participants and that these friendships ultimately supported criminal behavior. This program points to the potential dangers of youth interacting with each other across differing levels of delinquency risk, with mentoring programs having the potential to create conditions that cause harm rather than providing benefit.

While this peer contagion literature was not specifically looking at cross-age peer mentoring programs, peer contagion could affect these relationships. Even though mentoring relationships may benefit from being one-on-one relationships, it is still important to investigate the impact of peer contagion among mentors and mentees, particularly when

programs facilitate group time for mentors and mentees involved in the program. Given that many youth mentoring programs are school-based, groups of youth mentors may travel to the program together and mentor alongside each other. They may interact with each other in ways intended to facilitate connection with each other, while unintentionally providing modelling of negative attitudes and behaviors to their younger mentees.

Further research on peer relationships demonstrates that children's school attitudes and engagement significantly predicts their peer group and that switching peer groups leads to adoption of the new peer group's attitudes and engagement (Kindermann, 1993). One can imagine the potential benefits and detriments of this finding, as youth can be pulled to more helpful or harmful attitudes and behaviors based on their peer group. Interventions that intend to facilitate the potential prosocial benefits of youth influence can sometimes unintentionally foster anti-social attitudes and/or delinquency when youth come together and model anti-social behaviors and attitudes (Patterson et al., 2000). This points to the importance of the group dynamic and attitudes youth bring to a group setting or intervention program, since youth can shape the context in a more pro-social or anti-social direction. Fostering an environment that facilitates pro-social development, and ensuring that this environment is shaped by peers rather than adults, allows for children to learn and be rewarded for social and academic skillfulness.

In sum, peer relationships can have a significant impact on youth, in both prosocial and antisocial ways. Youth look up to older peers, who are uniquely positioned to promote positive youth development through modeling and rewarding prosocial attitudes and behaviors. However, the negative effects of peer contagion can be pervasive when youth promote deviant attitudes and behaviors. It is important to determine how these theories of

peer influence are reflected in cross-age peer mentoring relationships, as well as the factors that lead to positive versus negative outcomes of peer mentoring programs. Initial findings from other intervention and education programs, as well as intergenerational youth mentoring programs, point to the significant impact of adult oversight and support, as well as targeted interventions, in promoting successful outcomes. The next section will examine the cross-age peer mentoring literature in more detail, identifying the impacts of individual programs on youth outcomes.

Effectiveness of Cross-Age Peer Mentoring Across Outcomes

How effective is cross-age peer mentoring? To answer this question, Karcher and Berger (2017) conducted a comprehensive review of cross-age peer mentoring programs, in which they examined the impacts of these programs on mentee outcomes. They included only one-to-one formal mentoring programs in which the mentoring relationship was prioritized over learning a curriculum. Their results were mixed, depending on the type of outcome (see Table 1 for a description of each study's structure and findings).

Table 1.
Studies included in Karcher & Berger 2017 review

Name	Structure	Findings
Big Brothers Big Sisters of America (BBBS), High School Bigs study (Herrera et al., 2008)	Relationship-focused school-based mentoring with high school mentors supported by local BBBS agencies. Volunteer mentors met with students at their school for approximately one hour per week during or after school, with a general focus on social and academic activities.	Youth matched with a high school mentor did not show significant improvement on a variety of school-related self-report and teacher-report measures (e.g., misconduct, classroom effort, etc.) when compared with non-mentored youth. Several moderators contributed to increased benefits of having a teenage mentor, namely mentor training (higher amount and better quality) and staff support (better perceived quality and increased frequency of communication).

Secondary analysis of data from the U.S. Department of Education's Student Mentoring Program study (Hwang, 2015)	School-based mentoring for students at risk for academic underachievement. Specific mentoring activities were not mandated. Supported activities were designed to improve interpersonal relationships, increase personal responsibility and community involvement, discourage substance use, use of weapons, and other delinquency involvement, reduce dropout rates, and improve academic achievement.	Students with a teenage mentor (compared to adult mentor) reported more scholastic efficacy than students in the control group at post-test. Mentees who had teenage mentors were less likely to have problematic behaviors, but the relation was not significant. The results of this study do not support the hypothesis that teenage mentors are more likely to have a negative impact on their mentees. The findings of this study suggest that mentors whose ages are close to those of mentees have more positive impacts on their mentees.
Cross-Age Mentoring Program (CAMP) Cross-Campus Model (Karcher, 2005)	Meetings included a whole-group icebreaker activity, one-to-one informal conversation and discussion time, a structured dyadic activity from a connectedness curriculum, and short unstructured time to interact in the larger group with others.	Findings indicated that mentored youth reported higher scores on connectedness to school and parents at post-test than the control group. Mentor attendance, but not mentee attendance, was positively associated with pre-to-post changes in mentees' self-reported rule compliance, social skills, and self-esteem, suggesting exposure to the curriculum (i.e., mentee attendance) was less predictive of program changes than was the mentor's presence.
Cross-Age Mentoring Program (CAMP) Outreach Model (Karcher, 2008; Karcher et al., 2002)	Monthly Saturday events for a full academic year plus summer enrichment program. Meetings were structured with a variety of activities of the following types: a curriculum to structure the mentor-mentee relationships, academic skills development activities, connectedness activities, and unstructured time to interact with others.	At one year (post-test) the mentored youth reported higher scores on connectedness to parents and spelling achievement. Analyses revealed that improvements in spelling achievement were fully explained by gains in connectedness to parents, suggesting that academic benefits from program participation were largely due to gains in connectedness to parents that resulted from program participation.
Untitled (Sar & Sterrett, 2014)	Goals of the program were to reduce negative behaviors	Youth and teachers reported reductions in problem behavior from pre-test to post-test, but this change was only significant for the relational mentoring condition. At the six-

	associated with delinquency risk and improve school performance among at-risk middle school students. Mentoring either took a relational approach, an instrumental approach, or a risk reduction approach.	month follow-up period, youth in the relational mentoring program reported higher family well-being/functioning scores, greater family life satisfaction, and greater satisfaction in their relationships with their mothers.
Big Brothers Big Sisters of Canada, Edmonton agency study (Cavell et al., 2018)	Program included three approaches to mentoring each with distinct goals: (1) provide a supportive relationship; (2) promote peer relationships; (3) help mentees academically. Programs varied in their mentor and mentee recruitment/inclusion strategies.	Overall, mentees self-reported significantly higher ratings of self-worth and social competence at post-test than at pre-test. Teacher ratings of mentees' academic performance were significantly higher at posttest than at pre-test. The largest benefits were for mentees who were individually selected for the mentoring program, were matched with volunteer teen mentors, and whose mentoring focused largely on relationship development. Mentees from whole-class mentee referrals and those with teens who mentored to fulfill course requirements fared least well.
Children Teaching Children (CTC) Program (Sheehan et al., 1999)	Program goals were to develop a cross-age mentoring relationship, structured by violence prevention activities, to modify violence attitudes and behaviors among preadolescents. The teenage mentors in the CTC program designed and presented lessons to teach younger children about violence prevention.	On the first measure assessing "exposure to violence and/or acceptance of violence," at the end of the study, the intervention group reported lower scores than control subjects. On a second measure of acceptance of violence, differences between the intervention and comparison group emerged at both 9 and 18 months, favoring mentees. Teacher ratings of youth behavior showed significantly worse ratings for control group subjects compared to the intervention group, post-treatment.

Behavioral

Karcher and Berger (2017) explored the impact of cross-age peer mentoring on mentee misbehavior and misconduct. Of the studies that included misbehavior as an outcome variable, half reported lower rates of youth misbehavior after participation in cross-age peer

mentoring (Sar & Sterrett, 2011; Sheehan et al., 1999). Importantly, the studies that found reductions in misbehavior were specifically serving youth at risk for delinquency and gang membership. A study of the impact of Big Brothers Big Sisters (BBBS) programs, in which the mentors were high school students, found no benefits of teen mentorship on misconduct (Herrera et al., 2008). In another large sample study, the Institute for Educational Science's (IES) study of the Student Mentoring Program, mentees with teenage mentors reported less misconduct at post-test compared to mentees with adult mentors and control group students, but the difference was not statistically significant (Hwang, 2015).

Academic

Next, Karcher and Berger (2017) looked at the academic impacts of cross-age peer mentoring. Improvements in skills and attitudes was found in four of the seven studies included in the review. For example, a randomized study of the CAMP program, which incorporated academic instruction as part of the intervention, showed mentee improvement in school connectedness and spelling achievement (Karcher et al., 2002). The other CAMP study, implemented after school, similarly demonstrated benefits to school connectedness, but did not demonstrate changes in grades or other achievement outcomes (Karcher, 2008). A study looking at differences in pre-post changes for children matched with high school mentors as part of a BBBS agency in Edmonton, Canada found increases at post-test of teacher-reported academic performance (Cavell et al., 2018). In contrast, children with teen mentors in the BBBS High School Bigs program benefited less (or did not improve at all) on a variety of academic outcomes, including classroom effort, GPA, and intentions to go to college (Herrera et al., 2008).

Socioemotional

Regarding socioemotional outcomes, Karcher and Berger's (2017) review highlights promising findings. Mentees in the BBBS High School Bigs program demonstrated higher social acceptance, parent relationship quality, and assertiveness when compared with adult-mentored youth (Herrera et al., 2008). The BBBS Edmonton program also found socioemotional improvements for mentees, including connectedness to peers and peer acceptance, as well as self-esteem (Cavell et al., 2018). Similarly, beneficial socioemotional outcomes were found for youth participating in the cross-age peer mentoring programs geared at prevention of delinquency and gang membership (Sar & Sterrett, 2011; Sheehan et al., 1999). Cross-age peer mentoring programs have also shown relationship benefits such as increased family connectedness and improved family relationships (Herrera et al., 2008; Karcher, 2008; Karcher et al., 2002; Sar & Sterrett, 2011).

Karcher and Berger (2017) conclude that there is some evidence of benefits to youth who participate in cross-age peer mentoring programs, but that it is difficult to evaluate the effectiveness of these programs, given limitations in research designs and small sample sizes. Overall, their review found evidence of socioemotional benefits to mentees relating to family and peer relationships and self-esteem, as well as positive impacts on school connectedness. The review revealed mixed findings regarding academic and behavioral outcomes, with some studies finding benefits to school achievement and misbehavior, and others finding no benefit to mentees on these outcomes.

There are additional cross-age peer mentoring evaluations not included in Karcher and Berger's 2017 review. Their review excluded mentoring studies that primarily emphasized the use of curricula. Given the evidence that increased structure and targeted

mentoring interventions can improve program outcomes in intergenerational mentoring programs (Christensen et al., 2020), the current study will include evaluations of more structured, goal-focused, and/or curriculum-based programs. In one such evaluation, teen mentors were paired with younger children to deliver a curriculum aimed at promoting healthier diet and exercise habits, and encouraged their mentees to set reasonable behavioral goals for themselves (Smith, 2011). Results demonstrated benefits to mentored youth, including greater improvement in knowledge, attitudes, efficacy, perceived support, and body mass index.

Furthermore, while Karcher and Berger's review included published studies and program reports, it did not include any program evaluations from unpublished dissertations. To protect against publication bias, the current study will include dissertation studies of cross-age peer mentoring evaluations. Tomlin's (1994) dissertation study of a mentoring program for improving the academic attainment of Black adolescent males showed promising results, with mentored youth showing significantly higher posttest results on measures of self-efficacy, grade point average, and teacher conduct ratings compared to wait list control youth.

Given the diversity of findings across studies, it is important to examine these findings further. To date, there are no meta-analytic studies on one-to-one cross age peer mentoring evaluations. Meta-analysis will yield more precise and reliable estimates of the overall impact of mentoring, compared to individual evaluations, and will allow for comparisons of impact across a variety of mentor, mentee, match, program, and study characteristics, which will have important implications for policy and practice.

Moderators of Mentoring Effectiveness

The current meta-analysis examines a wide range of youth, mentor, match, program, and methodological characteristics that may moderate program effects, given evidence in the literature that certain characteristics significantly influence the impact of mentoring on youth outcomes. As cross-age peer mentoring programs continue to develop and utilize a variety of program practices, it is important to identify which practices are most helpful to youth, as well as whether specific practices may have harmful effects.

Mentee characteristics

Several mentee characteristics have been shown to moderate the effects of cross-age peer mentoring. Research has demonstrated that having a more behaviorally difficult mentee predicts lower-quality mentoring relationships, inconsistent mentor attendance, and a higher likelihood of mentor attrition (Herrera et al., 2008; Karcher, 2005; Karcher & Lindwall, 2003). In addition, there is evidence that youth who are individually identified as appropriate for cross-age peer mentoring and are enrolled in a program show greater outcome gains over time than youth enrolled in whole groups (e.g., an entire classroom) (Cavell et al., 2018). This finding indicates that not all youth may need or benefit from cross-age peer mentoring, and that taking a more targeted approach to this intervention could be more effective. In addition, intergenerational youth mentoring research has demonstrated several youth characteristics that moderate program effects. For example, stronger program effects were found for programs that serve a higher percentage of male youth (Dubois et al., 2011; Raposa et al., 2019). Furthermore, intergenerational youth mentoring research has demonstrated stronger outcomes for programs serving youth with greater levels of individual and environmental risk (Dubois et al., 2011). Mentoring programs may be particularly effective

for youth who initially report higher risk for negative outcomes (Dubois et al., 2002; Poon et al., submitted for publication).

Mentor characteristics

There are also mentor characteristics that have been linked to the effectiveness of cross-age peer mentoring. Research has identified attitudinal and motivational characteristics of mentors that explain variability in outcomes. Teen mentors with more positive attitudes toward youth are more effective with academically disconnected mentees than are mentors with less positive attitudes toward youth (Herrera et al., 2008). Research has also linked mentors' social interest to program outcomes, with higher social interest corresponding with positive youth outcomes (Karcher & Lindwall, 2003). These findings suggest the potential benefits of recruiting and screening for youth mentors who hold certain prosocial attitudes. In addition, a recent intergenerational youth mentoring meta-analysis demonstrated larger effects in programs that had a higher percentage of male mentors (Raposa et al., 2019).

Program characteristics

There is substantial diversity in program practices across cross-age peer mentoring programs that may impact intervention outcomes. Research reveals a few moderators of program effectiveness. Matches last longer when programs incorporate both mentor-mentee time, as well as time for larger group activities (Herrera, et al., 2008). Research points to the deleterious effects of mentor compensation, with fewer benefits found in matches with compensated mentors (Cavell et al., 2018; Herrera et al., 2008). Adult oversight and involvement in mentoring interventions also appears to impact outcomes. Level of staff support is positively associated with mentors' views of relationship quality and program satisfaction (Herrera et al., 2008). Research suggests that increased time spent in training and

higher quality mentor training can also positively impact outcomes (Herrera et al., 2008; Karcher et al., 2011). Furthermore, programs that promote parent involvement through incorporation of family events demonstrate greater mentor satisfaction with their match (Karcher et al., 2005). Matches that engaged in more structured activities and goal-directed conversations had teen mentors who viewed their programs more favorably, suggesting that increased guidance and structure regarding program interventions may contribute to positive mentor experiences (Herrera et al., 2008). Moreover, a recent intergenerational mentoring meta-analysis, which specifically investigated the benefits of targeted versus non-specific/friendship-based models of mentoring, found that targeted programs (i.e., those that focused on specific youth outcomes tailored to the population they served) were significantly more effective than friendship-based programs (i.e., those focused on relationship-building and non-specific recreational activities) (Christensen et al., 2020). Together these findings indicate that type of intervention and level of adult support can influence youth mentoring effectiveness.

Methodological characteristics

An important factor that has been consistently shown to predict effect sizes in meta-analyses across fields involves the methodological approach of the study. Specifically, research shows that studies employing random assignment yield smaller effect sizes than those employing less rigorous quasi-experimental designs (Cheung & Slavin, 2015). Additionally, published studies tend to report greater effect sizes than unpublished reports due to biases in publishing significant results (Cheung & Slavin, 2015). Therefore, it is important to account for potential publication biases when conducting a thorough meta-analysis. These biases can be explored by examining differences in effect sizes between

reports based on publication status (e.g., dissertations, program reports, and journal articles), and by comparing the observed distribution of effect sizes against a theoretical distribution of effect sizes showing no publication bias through funnel plot analysis (Egger et al. 1997).

Summary of the Current Study

Given that the literature evaluating the impact of cross-age peer mentoring programs is limited, a meta-analysis is warranted and will improve insight on the effectiveness of these programs overall, providing implications for implementation of these programs in the future. Although the number of evaluation studies of cross-age peer mentoring programs is limited, meta-analytic evaluations of mentoring programs have been conducted for small samples in the past (e.g., three studies in Wheeler et al., 2010), demonstrating that this analytic method can be useful and informative even with a limited number of studies included.

The current study aims to fill a gap in the literature by using meta-analysis to explore the effectiveness of cross-age peer mentoring programs. As such, analyses include only studies that evaluated a program aimed at improving youth outcomes through a one-on-one, cross-age peer mentoring relationship. The current study utilizes Karcher and Berger's (2017) definition of cross age peer mentoring as "the matching of an older youth (the mentor) with a younger youth (the mentee), in which there is a difference of two or more years in age between mentor and mentee" (pp. 2). Thus, the present sample consists of studies that examine a relationship between a younger mentee and an older peer mentor, rather than programs that involve adult-youth mentoring or only group mentoring. Studies in which mentoring is not a primary, or even secondary, component of the intervention were excluded. These guidelines ensure that analyses will examine mentoring programs designed to improve youth outcomes through mentee relationships with older peers.

The current meta-analysis aims to answer the important question of how effective cross-age peer mentoring is and which specific youth outcomes are most strongly influenced by this intervention approach. Cross-age peer mentoring has been utilized to address a wide range of emotional, behavioral, academic, and social outcomes. The present study utilizes a two-tier system to examine the differential impact of cross-age peer mentoring on youth outcomes. In keeping with the typical targets of mentoring interventions, youth outcomes are grouped into five broad categories: school functioning, social relationships, health, cognition, and psychological symptoms (Raposa et al., 2019). In addition, sub-categories within each broad category are used to categorize mentee outcomes. For example, school functioning outcomes were coded as relevant to one of three sub-categories: school engagement, academic achievement, or extracurricular activities (see Methods section for more details). These categories were derived from an expert review of the developmental psychopathology and positive youth development literatures and allowed for assessment of the effectiveness of mentoring on constructs that are aligned with more recent research on the etiology and prevention of clinical issues, as well as the promotion of well-being in youth (Raposa et al., 2019).

In addition to re-coding outcomes using a two-tiered system, the current study used three-level meta-analysis, which accounts for the statistical dependency among effect sizes within studies, and therefore allows for the inclusion of more than one effect size per study. This approach increases statistical power, accounts for both within- and between-study variability, and facilitates analyses of moderators that might explain either within- or between-study variance (Van den Noortgate et al., 2014). The present three-level meta-analysis accounts for the nesting of three types of outcome data (i.e., narrow outcome

domains within broad outcome domains within overall study effect sizes), while also allowing for estimates of multiple between-study (e.g., mentoring program characteristics, publication type) and within-study (e.g., mentee-report measures versus teacher-report measures) moderators.

To address gaps in the existing literature, the current meta-analysis examines the impact of cross-age peer mentoring using all relevant outcome studies of cross-age, one-on-one peer mentoring programs written in English. Stringent inclusion criteria ensure that analyses examine peer mentoring programs designed to improve youth outcomes through a supportive relationship in which there is a difference of two or more years in age between the older mentor and younger mentee. Using a multilevel meta-analytic approach, the analyses (1) estimate the overall effect size of cross-age peer mentoring programs, as well as within- and between-study variability in effect sizes; (2) test whether the effects of cross-age peer mentoring are different across diverse outcome categories (e.g., school-related versus psychological outcomes); (3) examine whether the size of program effects are moderated by key youth characteristics, mentor characteristics, program characteristics, and methodological characteristics; and (4) test the role of publication bias in the calculated overall effect size.

CHAPTER 3

METHODS

Study Selection

A comprehensive search of the literature published prior to April 2019 was conducted to identify evaluations of cross-age peer mentoring programs. Both computer-based and manual search methods were used to locate studies for the current analysis. The computerized databases utilized were PsycINFO, ERIC, and ProQuest. A comprehensive search of each computerized database included the following terms and combinations of terms: Peer mentoring, Cross-age peer mentoring, Peer mentoring + evaluation, Peer mentoring + intervention, Peer mentoring + outcomes, Peer mentoring + effects, Peer mentoring + randomized control trial, Peer mentoring + experimental. Moreover, prior cross-age one-on-one peer mentoring reviews and intergenerational mentoring meta-analyses were manually searched to identify additional articles.

Duplicate studies were screened out prior to evaluation for inclusion. To be considered for inclusion in the final sample, studies met the following criteria: (1) A formal mentoring program, with mentoring defined as an older youth (at least two years older) acting in a non-professional helping capacity with a specific younger person to promote positive youth outcomes through the relationship. The two-year age gap is based on Karcher and Berger's (2017) definition of cross-age youth mentoring, with the age difference allowing the older youth mentor to fulfill several roles similar to those in adult-youth mentoring that same-age peer relationships might not. Being older allows the peer mentor to more effectively act as a role model, provide support, and offer guidance to their mentee.

Relationships that were more professional in nature, such as tutoring or coaching, were not included. (2) An evaluation with a comparison group, including randomized controlled trials and quasi-experimental studies. Studies were excluded from the meta-analysis if they met any of the following exclusion criteria: (1) studies with adult mentors (high school graduates or age equivalent) or that combined adult and cross-age peer mentors without a separate analysis of each, (2) mentees and mentors who had less than a two year age difference, (3) only group mentoring, (4) insufficient treatment versus control group differentiation (e.g., both groups received mentoring interventions, or the treatment group included a substantial proportion of participants who never received mentoring), (5) adjunctive mentoring (i.e., evaluations in which mentoring was not one of the primary or secondary components), (6) outcomes measured did not fall into one of the following broad categories: psychological, social, school, health, or cognitive, (7) insufficient information to compute an effect size, and the author did not respond to requests for additional information within one month of the request, and (8) the study was written in a language other than English. This procedure yielded 6 studies for analysis (see Figure 1 for an overview of study selection and Table 2 for a description of all included studies).

Study Coding Procedures

Studies were coded for mentee, mentor, match, program, and methodological characteristics by two raters. Raters adhered to a coding manual, which outlined coding procedures and codes for each characteristic. Raters with advanced statistical experience coded study outcomes. The lead coders attended a training led by a researcher with expertise in meta-analytic techniques (i.e., over a decade of experience with conducting and writing about meta-analyses in the social sciences). Moreover, throughout the outcome coding

process, weekly meetings were conducted in which the raters discussed and resolved difficulties or discrepancies in coding and effect size calculation. All studies were double-coded and discrepancies in coding were resolved through joint review of study details and consultation of past literature.

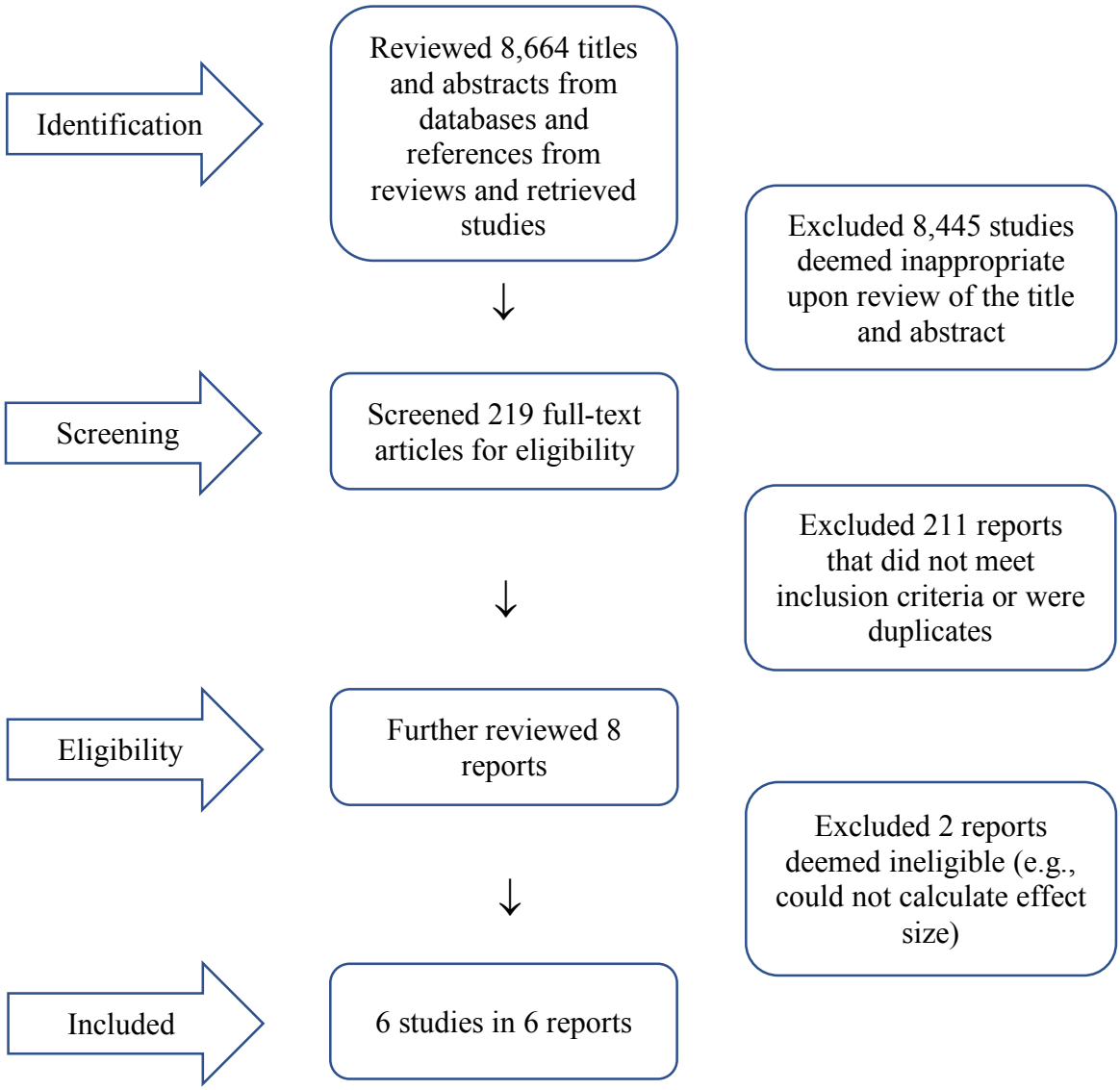

Figure 1. Flowchart of the study selection process. The comprehensive search for studies utilized computerized database searches (PsycINFO, ERIC, and ProQuest), as well as a manual search of other resources. Studies were screened for inclusion and exclusion criteria, and authors were contacted if additional data was needed for effect size calculation. Studies for which there was insufficient data (and when authors did not respond in a specified time frame) were excluded. This procedure yielded 6 studies for analysis.

Table 2.
Studies included in the current meta-analysis

Name	Structure	Findings
Big Brothers Big Sisters of America, High School Bigs study (Herrera et al., 2008; data taken from What Works Clearinghouse Review, 2013)	Relationship-focused school-based mentoring with high school mentors supported by local BBBS agencies. Volunteer mentors met with students at their school for approximately one hour per week during or after school, with a general focus on social and academic activities.	Youth matched with a high school mentor did not show significant improvement on a variety of school-related self-report and teacher-report measures (e.g., misconduct, classroom effort, etc.) when compared with non-mentored youth. Several moderators contributed to increased benefits of having a teenage mentor, namely mentor training (higher amount and better quality) and staff support (better perceived quality and increased frequency of communication).
Cross-Age Mentoring Program (CAMP) Cross-Campus Model (Karcher, 2005)	Meetings included a whole-group icebreaker activity, one-to-one informal conversation and discussion time, a structured dyadic activity from a connectedness curriculum, and short unstructured time to interact in the larger group with others.	Findings indicated that mentored youth reported higher scores on connectedness to school and parents at post-test than the control group. Mentor attendance, but not mentee attendance, was positively associated with pre-to-post changes in mentees' self-reported rule compliance, social skills, and self-esteem, suggesting exposure to the curriculum (i.e., mentee attendance) was less predictive of program changes than was the mentor's presence.
Cross-Age Mentoring Program (CAMP) Outreach Model (Karcher, Davis, & Powell, 2002)	Monthly Saturday events for a full academic year plus summer enrichment program. Meetings were structured with a variety of activities of the following types: a curriculum to structure the mentor-mentee relationships, academic skills development activities, connectedness activities, and unstructured time to interact with others.	At one year (post-test) the mentored youth reported higher scores on connectedness to parents and spelling achievement. Analyses revealed that improvements in spelling achievement were fully explained by gains in connectedness to parents, suggesting that academic benefits from program participation were largely due to gains in connectedness to parents that resulted from program participation.
Children Teaching Children (CTC) Program (Sheehan et	Program goals were to develop a cross-age mentoring relationship, structured by violence prevention activities, to	On the first measure assessing "exposure to violence and/or acceptance of violence," at the end of the study, the intervention group reported lower scores than control subjects. On a second measure of acceptance of violence,

al., 1999)	modify violence attitudes and behaviors among preadolescents. The teenage mentors in the CTC program designed and presented lessons to teach younger children about violence prevention.	differences between the intervention and comparison group emerged at both 9 and 18 months, favoring mentees. Teacher ratings of youth behavior showed significantly worse ratings for control group subjects compared to the intervention group, post-treatment.
Just for Kids! Mentoring to promote healthy diet and physical activity among children in Appalachia (Smith, 2011)	Children received the Just for Kids! curriculum delivered by trained high school-age teen mentors. The curriculum addresses the roles of exercise, daily activity, and food in promoting health, and moderation in sedentary activities, and encourages children to set reasonable behavioral goals for themselves. It also addresses self-acceptance, processing emotions, assertiveness, and positive self-evaluation.	Results indicate that aspects of the Just for Kids! curriculum were effective in impacting children's dietary intentions and BMI percentiles. The curriculum did not impact intention to engage in regular physical activity. The greatest gain for the intervention group was in self efficacy toward physical activity. Overall, a change in attitudes toward eating healthfully trended toward improvement for less than half of the children in the intervention group. Gains were noted in perceived support from others such as family members to engage in physical activity and eat healthfully among children in the teen-mentored group.
"Will and Skill" A mentor program for improving the academic attainment of Black adolescent males (Tomlin, 1994)	Mentoring focused on the establishment of a "skill" domain to help students acquire strategies for self-regulatory skills and academic success, as well as including a focus on a strong mentoring relationship. The format of mentor/ mentee meetings included discussions about mentees' school performance and progress reports, as well as teaching self-regulatory learning strategies. Mentors verbally shared how they use strategies, modeled the strategies, and asked mentees about their strategy usage.	Mentored youth showed significantly higher posttest results on measures of self-efficacy, grade point average, and teacher conduct ratings compared to wait list control youth. No significant differences were found for measures of unexcused absences, office referrals, suspensions, and self-perception for scholastic competence, social acceptance, behavioral conduct, and global self-worth.

Outcomes for each study were noted and coded for several characteristics, such as information source and statistical details (e.g., sample size, means, standard deviations). These coded outcome characteristics were utilized to calculate an effect size for each outcome. Outcomes were also coded as belonging to one of the following five broad categories: psychological, social, cognitive, health, or school. Additionally, each broad outcome was coded according to a more specific set of sub-categories, termed "narrow outcomes" (i.e., externalizing symptoms, internalizing symptoms, self-regulation problems, overall mental health, substance use, physical health, general well-being, executive functioning, self-cognition, academic functioning, school engagement, extracurricular engagement, social skills, social support, peer relationship, teacher relationship, and parent relationship).

In addition to the outcome type, the following characteristics were coded as potential moderators of program effect sizes.

Mentee characteristics

Mentee gender, age, grade, race/ethnicity (Hispanic/ Latino, Black/African American, White, Asian, Native Hawaiian/Other Pacific Islander, American Indian/ Alaska Native, Multiracial, and "other"), and mentee sample size were examined as potential moderators of program effectiveness. Raters recorded these mentee demographic characteristics for each study. Several variables were also coded as indicators of youth risk. First, as a proxy for low socioeconomic status, the percent of mentees receiving free or reduced-price lunch was coded for each study. Other coded indicators of risk included percentage of mentees living in a single-parent household, percentage of mentees performing below grade level academically, and percentage of mentees with reported involvement in problem behaviors

(e.g., fighting, being sent to the principal's office, suspensions, truancy, risk of dropping out of school, drug/alcohol use, early sexual activity). In addition, coders rated whether each study was designed for intervention with one of the following specific populations of youth: general population, multiple risk indicators, racial/ethnic minority youth, youth from single-parent households, youth from low-SES families, or foster care youth. Finally, raters coded whether mentees received an incentive for their participation in the mentoring program (e.g., course credit, payment).

Mentor characteristics

Mentor gender, age, grade, and race/ethnicity (Hispanic/ Latino, Black/African American, White, Asian, Native Hawaiian/Other Pacific Islander, American Indian/ Alaska Native, Multiracial, and "other") were examined as predictors of mentoring program effectiveness. In addition, raters coded whether mentors had previous mentoring experience, whether mentors received an incentive for their participation in the mentoring program (e.g., course credit, payment), and whether participation in the mentoring program was voluntary.

Match characteristics

Raters coded match characteristics including percentages of cross-race and cross-sex matches, whether mentoring dyads were intentionally matched based on sex, race, or interests, whether mentors and youth came from the same communities, and average age difference between mentors and mentees.

Program characteristics

In order to examine moderation of effect sizes by program characteristics, raters coded the average number of pre-match mentor training hours for each mentoring program, as well as the expectations around program intensity (i.e., meeting frequency and expected

overall program length). Raters also coded for level of adult oversight and supervision that mentors received throughout their mentoring relationship. In addition, the primary focus of the mentoring program was coded for each study: nonspecific/general positive youth development, improving academic performance, reducing behavioral problems, reducing psychosocial problems, or improving health. Raters also coded whether the program had targeted interventions aimed at the youth it was serving, and whether mentoring was the sole intervention of the program, or whether it was the primary intervention in the context of other program components. Raters coded whether each program utilized a curriculum. Raters also coded whether there was a family component to each program (e.g. family events/activities). In addition, raters coded the program's geographical location (i.e., urban, suburban, rural, or mixed), as well as the primary program site (i.e., school versus community-based). Finally, raters coded the type of mentoring intervention in terms of whether the intervention was solely conducted as a one-to-one relationship or whether the program incorporated both one-to-one and group mentoring activities.

Methodological characteristics

Finally, several aspects of each study's research design were coded to account for their influence on the reported effect size. The publication status (i.e., published in journal, dissertation, or report) as well as the year the study was published, defended, or presented to the public was noted. In addition, each study's design was coded as a randomized controlled trial or a quasi-experimental design, with both types including a treatment condition and a no-treatment or waitlist control condition. The control group for each study was coded as "no treatment" versus "treatment as usual." "No treatment" indicated control groups that did not receive any intervention (e.g., a waitlist control), while "treatment as usual" indicated control

groups that received other services offered by a program (e.g., tutoring, social services), without a specific mentoring component. The source of outcome information (i.e., youth, parent, school record, teacher, or other reporter) was also coded. Finally, a structured rating of study quality (i.e., weak, moderate, or strong) was assigned to each study using an established procedure that accounts for study selection bias, study design, confounding variables, blinding, data collection methods, withdrawals and dropouts, intervention integrity, and analysis (National Collaborating Centre for Methods and Tools 2008).

Effect Size Calculation and Data Analyses

The standardized mean difference between the experimental and control group was calculated as an effect size measure, with a positive value indicating an advantage for the treatment (mentoring) group over the control group. This value was transformed into Hedges' g in order to adjust for differences in sample size (Hedges & Olkin, 1985). When means, standard deviations, sample sizes, or other information necessary for the calculations were not reported, study authors were contacted for additional information.

Given that more than one effect size was calculated for each study, a three-level approach to meta-analysis was applied to deal with the interdependency of effect sizes (Van den Noortgate et al. 2014). The major advantage of the three-level approach is that all (dependent) effect sizes extracted from the same study can be included in the analysis, which preserves all available information. Moreover, three-level meta-analysis accounts for both within- and between-study variability, increases statistical power compared to the traditional meta-analytic approach, and facilitates the analysis of more moderators than is possible in traditional meta-analysis.

Three sources of variance are modeled in a three-level meta-analysis: the sampling variance of the observed effect sizes (level 1), the variance between effect sizes from the same study (level 2), and the variance between studies (level 3). The sampling variance of observed effect sizes (level 1) was estimated using a previously established formula (Cheung, 2014). Log-likelihood-ratio-tests were performed to compare the deviance of the full model relative to the deviance of the models excluding one of the variance parameters, which shows if significant variance is present at the second (within-study) and third (between-study) levels (Assink & Wibbelink, 2016). Significant level 2 or level 3 variance indicates a heterogeneous effect size distribution, meaning that the effect sizes cannot be treated as estimates of a common effect size. In that case, moderator analyses of outcome, participants, program, and/or study methodology characteristics may explain within-study and/or between study heterogeneity among effect sizes.

The three-level meta-analysis was conducted in R (version 3.2.0) with the metaphor-package, using a multilevel random effects model (Assink & Wibbelink, 2016). The restricted maximum likelihood estimate was used to estimate all model parameters, and the Knapp and Hartung (2003) method was used for testing individual regression coefficients of the meta-analytic models and for calculating the corresponding confidence intervals (see also Assink & Wibbelink, 2016). Each continuous moderator was centered around its mean, and dichotomous dummy variables were created for all categorical variables (Tabachnik & Fidell, 2013). In multilevel regression analyses, the intercept is the reference category, while the dummy variables test if, and to what extent, the other categories deviate from the reference category.

Publication bias analyses

Meta-analyses aim to include all previously conducted studies that meet inclusion criteria (Lipsey & Wilson, 2001). However, nonsignificant or unfavorable findings may be more difficult to locate, as they may not be reported or published in scientific journals. This is particularly the case for studies found in research reports and unpublished dissertations. Not including studies such as these may lead to "publication bias," an overestimation of the true effect size (Rosenthal, 1979). To check for evidence of publication bias, the present analyses examined differences in effect sizes between dissertations, program reports, and published journal articles.

Another way to examine the potential effect of publication bias on meta-analytic results is to use a funnel plot to inspect the distribution of points when each individual study's effect size (on the horizontal axis) is plotted against its precision, indicated by the reciprocal of the standard error (on the vertical axis). In the absence of publication bias, the distribution of plotted points should be shaped as a funnel, as the studies with small sample sizes are expected to show a larger variation in the magnitude of effect sizes, given the relatively large standard errors, compared to the studies with large sample sizes, with relatively small standard errors. A violation of funnel plot symmetry reflects potential publication bias, or a selective inclusion of studies showing positive or negative outcomes (Sutton et al., 2000). The effect of funnel plot asymmetry on the magnitude of the observed effect size can be examined by means of trim and fill procedures, which involves removing the asymmetric right- or left-hand side of the funnel in order to estimate the true center of the funnel, and then replacing the trimmed studies and their counterparts around the center.

The present study used both a funnel plot and a trim-and-fill analysis (Duval & Tweedie, 2000), conducted with the function 'trimfill' in the metaphor-package (Viechtbauer, 2010). All effect sizes were aggregated at the publication level (because publication bias is a publication-level phenomenon). Subsequently, trim and fill analyses tested for publication bias by examining whether effect sizes were missing on the left side of the distribution of effect sizes (indicating missing statistically non-significant or negative results). In contrast, missing effect sizes at the right side of the funnel would indicate selection bias due to an over-representation of studies with particular characteristics that might be systematically associated with larger effect sizes.

Sensitivity analyses

To investigate the robustness of the overall results, sensitivity analyses were conducted. The effect sizes were recalculated 6 times, each time removing a different study, to examine the influence of each individual study on the overall effect size (Viechtbauer & Cheung, 2010).

CHAPTER 4

RESULTS

Average Effect of Mentoring

There were 6 studies providing estimates of effect sizes of the impact of cross-age peer mentoring, with a combined sample size of 685 mentees. Characteristics of each study are presented in Table 3, and mean effect sizes for each study are presented in Table 4. The average effect size across all 6 studies and all outcomes was = .45 (p = .003; 95% CI: .16 to .74). This is a statistically significant medium effect size by Cohen's (1988) guidelines. This effect is the average across all studies, and analyses revealed that there was significant heterogeneity across studies ($\sigma^2_{\text{level 3}} = .11$, $p < .0001$), but no significant variability between effect sizes extracted from the same study ($\sigma^2_{\text{level 2}} = .00$, $p < .0001$). Notably, 83% of the variance among effect sizes was accounted for by the between-study level, while random sampling error accounted for 17% of the variance. To explore this substantial variability, a number of moderators were considered

Table 3.
Study characteristics

First author	Year	N	# ES	Study Type	Study Design	Length (months)
Herrera, C.	2008	416	19	report	RCT	9
Karcher, M.	2002	26	4	journal article	RCT	12
Karcher, M.	2005	54	4	journal article	RCT	6
Sheehan, K.	1999	62	3	journal article	Quasi	18
Smith, L.	2011	72	3	journal article	RCT	2
Tomlin, V.	1994	55	10	dissertation	Quasi	2

Note. *N* = highest sample size included in analysis, # ES = number of effect sizes per manuscript, RCT = Randomized Controlled Trial, Quasi = Quasi-experimental design.

Table 4.
Mean effect size for each study included in meta-analysis

Program	Mean Effect
Adapting the gang model: Peer mentoring for violence prevention. *Sheehan, DiCara, LeBailly, & Kaufer Christoffel (1999) (N=62)*	.96
The effects of developmental mentoring on connectedness and academic achievement. *Karcher, Powell, & Davis (2002) (N=26)*	.82
A mentor program for improving the academic attainment of black adolescent males. *Tomlin (1994) (N=55)*	.49
The effects of developmental mentoring and high school mentors' attendance on their younger mentees' self-esteem, social skills, and connectedness. *Karcher (2005) (N=54)*	.31
Piloting the use of teen mentors to promote a healthy diet and physical activity among children in Appalachia. *Smith (2011) (N=72)*	.23
High school students as mentors: Findings from the Big Brothers Big Sisters school-based mentoring impact study. *Herrera, Kauh, Cooney, Grossman, & McMaken (2008 (N=416)*	.03

0 0.2 0.5 0.8 1

"small" "medium" "large"

Hedge's g

Table 5.
Descriptive information for coded moderators

Moderator	Minimum	Maximum	Mean
Mentee characteristics			
Percentage male	31	100	55
Percentage White	0	86	35
Percentage Black	9	100	50
Percentage Hispanic	0	39	15
Age	9	12.5	11
Sample size	26	416	114
Mentor characteristics			
Percentage male	39	100	61
Percentage White	0	94	48
Percentage Black	0	100	43
Percentage Hispanic	0	22	7
Mentor incentive	40% yes, 60% no		
Program characteristics			
Program length in months	2	18	8
Pre-match training hours	2	8	5
Meeting frequency	1	9	4
Program location	60% urban, 40% rural		
Primary focus	50% general, 17% academic, 17% prob. beh., 17% health		
Primary site	67% school, 33% other		
Type of mentoring	33% one-to-one, 67% combination one-to-one and group		
Sole or primary intervention	67% sole intervention, 33% primary intervention		
Curriculum-based	17% yes, 83% no		
Targeted intervention	83% yes, 17% no		
Level of adult oversight/supervision	60% high, 20% moderate, 20% low		
Family component	40% yes, 60% no		
Methodological characteristics			
Year of publication	1994, 1999, 2002, 2005, 2008, 2011		
Publication status	67% published, 17% program report, 17% dissertation		
Study design	67% RCT, 33% Quasi experimental		
Study quality	17% strong, 67% moderate, 17% weak		
Source	55% mentee, 33% teacher, 12% school records		

as predictors of variability in youth mentoring effects across studies (descriptive statistics for coded moderators are presented in Table 5).

Differences in Effects Based on Youth Outcome Type

Analysis of differences in outcome type that might have accounted for heterogeneity across effect sizes are presented in Table 6. Many studies reported effect sizes for mentoring programs across a range of diverse youth outcomes, such as engagement in misconduct, school grade point average, or parent-child relationships. Using a multi-level approach, the current study first explored whether the effects of youth mentoring were different across five broad outcome categories: school, social, health, cognitive, and psychological outcomes. Results showed no significant differences in effect sizes across these five types of outcomes ($F(1, 41) = .38$, $p = .54$).

Next, the current study evaluated an even more precise coding of outcome types. Effect sizes of mentoring were compared for specific sub-categories, nested within the broader outcome types above. Results revealed no substantial variability across all outcome sub-types ($F(1, 41) = 2.37$, $p = .12$). Consistent with this result, there was no significant variability among the psychological outcomes (externalizing symptoms and overall mental health), health outcomes (substance use and physical health), cognitive outcomes (self-cognition), school outcomes (academic functioning and school engagement), or social outcomes (social skills and overall social support).

Moderators of Mentoring Effectiveness

Results of moderator analyses on between-study youth, mentor, program, and study/methodological characteristics are summarized in Table 6. Given the low sample size

of studies (n=6), moderators were only included in analyses if the moderator could be coded in at least 3 out of 6 of the studies (50%).

Mentee characteristics

Study coders coded mentee characteristics including sample size, gender, race, average age, average grade level, whether mentees received an incentive for their participation, and whether programs were designed for specific populations of youth. In addition, indicators of youth risk at baseline, including the percentage of single-family households, youth receiving free or reduced-price lunch, youth performing below grade level, and youth exhibiting problem behaviors were coded. Of these characteristics, sample size, gender, race, and average age were reported in at least 50% of the studies and were included in the analyses. Results showed that there was a trend for youth sample size, ($F(1, 41) = 3.35$, $p < .1$), indicating that mentees in studies with smaller sample sizes profited more from cross-age peer mentoring programs than did mentees in studies with higher sample sizes ($B = -.002$, $t = -1.83$, $p < .1$). There were no differences in study effect sizes based on mentee gender, race, or average age.

Mentor characteristics

Study coders coded mentor characteristics including gender, race, average age, average grade level, whether mentors received an incentive for their participation, percent who had previous mentoring experience, and whether participation was voluntary. Of these characteristics, gender, race, and mentor incentive could be coded in at least 50% of studies and therefore were included in the analyses. There were no differences in effect size based on mentor gender, race, or whether or not mentors received an incentive for their participation in the mentoring program.

Table 6.
Moderators of the effectiveness of mentoring programs

Moderator variable	*k*	*#ES*	B_0/ g	t_0	B_1	t_1	$F(df_1, df_2)$
Outcome domains							*F(4, 38) = 3.74*
School (RC)	4	18	0.42	2.50*			
Psychological outcomes	2	9	0.48	2.78**	0.06	0.94	
Health	2	4	0.59	3.18**	0.17	1.63	
Cognitive functioning	3	5	0.33	1.54	-0.09	-0.52	
Social	4	7	0.46	2.59**	0.03	0.47	
Outcome sub-categories							
School							*F(1, 16) = 0.02*
Academic outcomes (RC)	4	11	0.40	2.21*			
School engagement	4	7	0.39	2.14*	-0.01	-0.14	
Psychological symptoms							*F(1, 7) = 3.14*
Externalizing (RC)	2	8	0.29	1.14			
Overall mental health	1	1	1.19	2.69**	0.90	1.77	
Health							*F(1, 2) = 0.03*
Substance use (RC)	1	1	0.20	1.89+			
Physical health	1	3	0.23	1.63	0.03	0.19	
Social Functioning							*F(1, 5) = 1.48*
Social skills (RC)	1	2	0.04	0.51			
Overall social support	4	5	0.18	2.07*	0.14	1.22	
Mentee characteristics							
Percentage male	4	21	0.42	2.27*	0.002	0.21	*F(1, 19) = 0.04*
Percentage White	3	17	0.80	3.62***	-0.06	-1.26	*F(1, 15) = 1.61*
Percentage Black	3	17	0.49	3.54***	-0.31	-1.26	*F(1, 15) = 0.64*
Percentage Hispanic	3	17	1.04	2.50*	0.37	1.09	*F(1, 15) = 0.43*
Age	6	43	1.02	0.74	-0.05	-0.42	*F(1, 41) = 0.18*
Sample size	6	43	0.62		-0.002	-1.83+	*F(1, 41) = 3.35+*
				3.99***			
Mentor characteristics							
Percentage male	3	18	0.54	1.11	-0.04	-0.05	*F(1, 16) = 0.003*
Percentage White	3	18	0.24	1.16	-0.25	-0.10	*F(1, 16) = 0.11*
Percentage Black	3	18	0.48	3.67***	0.24	1.00	*F(1, 16) = 0.10*
Percentage Hispanic	3	18	2.71	1.96*	2.28	1.64	*F(1, 16) = 1.02*
Mentor incentive							*F(1, 22) = 0.04*
No (RC)	2	6	0.52	2.61**			
Yes	3	18	0.59	2.36*	0.07	0.21	
Program Characteristics							
Program length in months	6	43	0.16	0.69	0.04	1.53	*F(1, 41) = 2.33*
Pre-match training hours	3	17	0.55	3.53***	-0.04	-1.18	*F(1, 15) = 1.39*
Meeting frequency	5	43	0.73	3.16**	-0.07	-1.51	*F(1, 41) = 2.29*
Primary focus							*F(3, 39) = 2.16*
General (RC)	3	27	0.35	1.58			
Academic	1	10	0.48	1.30	0.13	0.30	
Problem behavior	1	3	0.95	2.43*	0.60	1.33	
Health	1	3	0.23	0.60	-0.12	-0.27	
Program location							*F(1, 22) = 4.26**
Rural (RC)	2	7	0.27	1.69+			
Urban	3	17	0.70	5.33***	0.43	2.06*	

Primary site							*F(1, 41) = 10.03***
Community (RC)	2	7	0.89	5.05***			
School	4	36	0.25	2.47*	-0.64	-3.17**	
Type of mentoring							
Individual and group (RC)	4	14	0.56	3.15**			*F(1, 41) = 1.16*
Individual	2	29	0.25	1.08	-0.31	-1.08	
Sole or primary intervention							*F(1, 41) = 1.11*
Primary (RC)	2	4	0.82	2.16*			
Sole	4	39	0.39	2.54*	-0.43	-1.05	
Curriculum based							*F(1, 41) = 0.39*
No (RC)	5	40	0.49	2.91**			
Yes	1	3	0.23	0.61	-0.26	-0.62	
Targeted intervention							*F(1, 41) = 2.87+*
No (RC)	1	19	0.03	0.13			
Yes	5	24	0.54	3.98***	0.51	1.69+	
Level of adult oversight							*F(1, 38) = 4.91**
Low (RC)	1	19	0.03	0.23			
Moderate-High	4	21	0.43	4.28***	0.40	2.22*	
Family component							*F(1, 22) = 0.0004*
No (RC)	3	16	0.55	2.77**			
Yes	2	8	0.54	2.12*	-0.01	-0.02	
Methodological Characteristics							
Year of publication	6	43	-0.10	-0.28	0.03	1.58	*F(1, 41) = 2.51*
Publication status							*F(2, 40) = 2.03*
Published journal article (RC)	4	14	0.56	3.11**			
Dissertation	1	10	0.48	1.42	-0.08	-0.22	
Report	1	19	0.03	0.10	-0.53	-1.42	
Study design							*F(1, 41) = 2.02*
RCT (RC)	4	30	0.31	1.96+			
Quasi-experimental	2	13	0.70	3.15**	0.39	1.42	
Study quality							*F(2, 40) = 3.32*
Strong (RC)	1	10	0.48	1.64			
Moderate	4	30	0.31	1.20*	-0.17	-0.52	
Weak	1	3	0.95	2.98**	0.47	1.09	
Source							*F(2, 39) = 4.60+*
Mentee (RC)	6	23	0.41	2.87**			
Teacher	3	14	0.42	2.88**	0.02	0.32	
School records	2	5	0.77	3.72***	0.36	2.13*	

RC reference category, *k* number of studies, *#ES* number of effect sizes, *B0/g* intercept/ mean effect size, t_0 difference in mean effect size and zero, B_1 estimated regression coefficient, t_1 difference in mean effect size with reference category, *F*(df1, df2) omnibus test, +p<.10; *p<.05; **p<.01; ***p<.001

Match characteristics

Study coders coded match characteristics including percentages of cross-race and cross-sex matches, whether mentoring dyads were intentionally matched based on sex, race, or interests, whether mentors and youth came from the same communities, and average age difference between mentors and mentees. None of these characteristics were included in the analyses due to sparse reporting of these variables across studies.

Program characteristics

Study coders coded program characteristics including expected program length in months, match meeting frequency per month, number of pre-match training hours, geographical location of the program, the primary focus (e.g., general versus psychosocial versus academic) of the program, whether the program had targeted interventions aimed at the youth it was serving, and level of adult oversight/supervision. Primary site of the program (i.e., school or other), type of mentoring (i.e., one-on-one or combination of one-on-one and group), whether mentoring was the sole or primary intervention in the program, whether there was a family component to the program, and whether the program was curriculum based were also coded.

All of these program characteristics could be coded in at least 50% of studies and therefore were included in the analyses. Results showed that there were statistically significant differences in the impact of youth mentoring based on the primary site of the program ($F(1, 41) = 10.03$, $p < .01$, with programs operating outside of schools yielding larger effects than programs that were school-based ($B = -.64$, $t = -3.17$, $p < .01$). Results also showed that there were statistically significant differences in the impact of youth mentoring based on the geographical location of the program ($F(1, 22) = 4.26$, $p < .05$), with programs

in urban locations yielding larger effects than programs in rural locations (B = .43, t = 2.06, p < .05). Additionally, results demonstrated a statistically significant difference in the impact of cross-age peer mentoring based on the level of adult oversight/supervision of program interventions ($F(1, 38) = 4.91$, $p < .05$). Programs with moderate to high levels of adult oversight/supervision yielded larger effects than programs with low levels of adult oversight/supervision (B = .4, t = 2.22, p < .05). Results also demonstrated a trend toward differences in the impact of peer mentoring based on whether the program had targeted interventions ($F(1, 41) = 2.87$, $p < .1$). Programs with targeted interventions yielded larger effects than programs without targeted interventions (B = .51, t = 1.69, p < .1).

There were no differences in the impact of youth mentoring programs based on expected program length, meeting frequency, number of pre-match training hours, or program primary focus. Likewise, no moderation was observed for the type of mentoring, whether there was a family component, whether mentoring was curriculum based, or whether mentoring was the sole or primary intervention in the program.

Methodological characteristics

Study coders coded methodological characteristics including year of study publication, publication status (i.e., published in a journal versus dissertation or program report), study design (i.e., randomized control trial or quasi experimental study), study quality (i.e. strong, moderate, or weak), and source of outcome information (i.e., youth, parent, school, teacher, or school report). All of these characteristics could be coded in at least 50% of studies and therefore were included in the analyses. Results showed that there was significant variability in effect sizes across source of outcome information ($F(1, 40) = 4.50$, $p < .05$), with school records (B = .36, t = 2.12, p < .05) yielding larger effect sizes than effect sizes yielded from

other methods (i.e. youth self-report, parent report, and teacher report). There were no significant differences in effect sizes based on year of study publication, publication status, study design, or ratings of overall study quality.

Publication Bias Analyses

Finally, a funnel plot analysis showed some indication of publication bias. Fourteen effect sizes were missing at the left side of the of the funnel plot (see Figure 2). Accounting for publication bias by means of a trim and fill analysis yielded a smaller non-significant mean effect size of Hedges' g= 0.19 (p = .36). However, there is still no valid and reliable way to examine publication bias in multi-level meta-analysis. Moreover, the funnel plot method assumes homogeneity of the overall effect size, an assumption which was violated in the current study. Therefore, this finding should be interpreted with caution.

Sensitivity Analyses

To assess each study's contribution to the overall effect, analyses were rerun 6 times, each time removing a different study (see Table 7) (Viechtbauer & Cheung, 2010). Findings from the leave-one-out sensitivity analyses indicated that the overall effect remained significant after each rerun; therefore, none of the studies had an individual, disproportionate, impact on the overall findings. Moreover, the interval of effect sizes obtained through the sensitivity analyses ($.34 < g < .54$) contains the overall effect size based on the total set of studies (.45) and overlaps with the 95% confidence interval of the total effect size (95% CI: .17 to .73). The sensitivity analyses show the validity and robustness of the overall meta-analytic results and demonstrate that no individual study had an excessive impact on the overall effect size.

Figure 2.
Funnel plot analysis

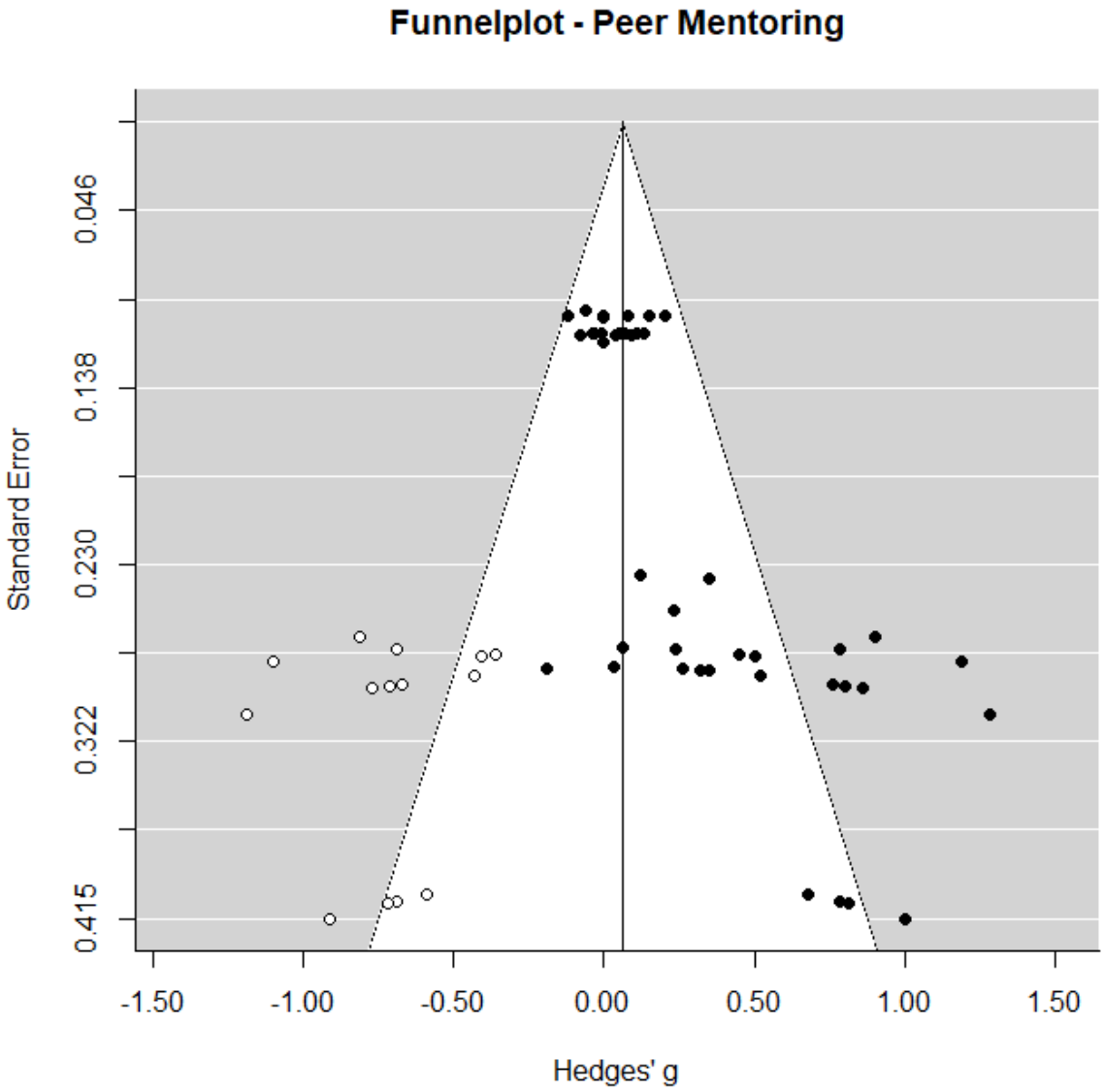

Table 7.
Leave-one-out sensitivity analyses

Overall effect	**# studies**	**# ES**	**Effect size (SE)**	**CI 95%**	***p***
Cross-age youth mentoring programs	6	43	0.45 (0.14)	(0.16-0.74)	.003**
- Excluding Herrera et al. 2008	5	24	0.54 (0.13)	(0.26-0.82)	<.001**
- Excluding Karcher 2005	5	39	0.48 (0.17)	(0.13-0.83)	.009**
- Excluding Sheehan et al. 1999	5	40	0.34 (0.12)	(0.09-0.59)	.009**
- Excluding Smith 2011	5	40	0.49 (0.17)	(0.15-0.83)	.006**
- Excluding Karcher et al. 2002	5	39	0.39 (0.15)	(0.08-0.69)	.015*
- Excluding Tomlin 1994	5	33	0.45 (0.18)	(0.08-0.81)	.018*

Note. # studies = number of studies, # ES = number of effect sizes, mean *g* = mean effect sizes, SE = standard error, CI = confidence interval, *p* = p-value
* $p < .05$, ** $p < .01$.

CHAPTER 5

DISCUSSION

The present study involved a comprehensive meta-analysis of all experimental and quasi-experimental evaluations of cross-age peer mentoring programs written in the English language prior to April 2019. A multi-level meta-analytic approach was used to estimate the overall effect size of cross-age peer mentoring programs, as well as to explore moderators of program effectiveness. Selection criteria that adhered strictly to a cross-age peer mentoring framework were used, such that only studies that evaluated mentoring programs in which an older youth (at least two years older) acted in a non-professional helping capacity with a specific younger person to promote positive youth outcomes were included. This excluded, for example, studies of tutoring programs or studies that included solely group mentoring interventions.

Effects of Cross-Age Peer Mentoring

Analyses of the data from six studies of cross-age peer mentoring programs revealed that the mean effect of mentoring on youth outcomes was .45. This effect is considered medium by Cohen's (1988) guidelines. The effect size observed in these analyses is more than double that observed in past comprehensive meta-analyses of intergenerational youth mentoring programs, which have shown overall effect sizes ranging from .18 to .21 (Dubois et al., 2002; Dubois et al., 2011; Raposa et al., 2019). This difference is notable, given the focus and prevalence of intergenerational mentoring programs compared to cross-age peer mentoring programs in practice and in the literature. No significant differences in effect size across broad outcome or narrow outcome domains of functioning were found. Taken

together, the lack of differentiation across outcome type suggests that the impact of mentoring is equally effective across domains of youth functioning. This stands in contrast to findings from intergenerational youth mentoring meta-analyses, which have found significant differences in effect size based on outcome type (DuBois et al., 2011; Raposa et al., 2019). The lack of difference found in the current study may relate to the small number of studies included in this meta-analysis (N=6), with insufficient power to detect a difference in effect size across outcome type. As additional evaluations of cross-age peer mentoring programs are conducted, differential impacts of cross-age peer mentoring on various youth outcomes may be detected.

Despite this lack of differentiation, the moderate and substantially larger (compared to intergenerational mentoring meta-analyses) overall impact of cross-age peer mentoring on youth outcomes, even within the context of a limited number of program evaluations, is notable and may stem from a variety of factors. Moderator analyses help to further explain the results of the current study. These moderators, discussed below, provide a framework for understanding how and when cross-age peer mentoring interventions may be uniquely effective.

The current study found significantly larger effects of cross-age peer mentoring for programs with moderate to high levels of adult oversight and supervision compared to programs with low levels of adult oversight and supervision. Elements of adult oversight and supervision in the moderate to high level studies included mandatory training for mentors, supervision to support intervention delivery, videotaping select mentor-mentee interactions to monitor intervention quality and provide additional support as needed, and program staff and

parent participation in program activities (Karcher et al., 2002; Karcher, 2005; Smith, 2011; Tomlin, 1994).

In contrast, the BBBS program demonstrated low adult oversight and supervision. In this study, 58% of high school mentors received less than two hours of training, with 31% reporting receiving no training at all (Herrera et al., 2008). While over half of these matches had BBBS support staff present during most match activities, Herrera and colleagues noted supervision from BBBS and school staff were not as frequent as would be expected given the age and experience level of youth mentors. The BBBS evaluation found that the effectiveness of their mentoring programs varied based on amount of mentor training, how often mentors talked with BBBS staff, and mentor ratings of quality of staff support. Mentees matched with more highly trained high school mentors reported higher levels of youth-centeredness, emotional engagement, and closeness in their relationships with mentors. These findings and the findings of the current study suggest that training and supervising youth mentors is imperative for the success of cross-age peer mentoring programs, and insufficient adult oversight may pose a threat to program effectiveness.

That higher levels of adult oversight and supervision were associated with stronger effects is consistent with findings of a previous meta-analysis of mental health providers and paraprofessionals delivering mental health services, the results of which suggested that the most important variables accounting for helper effectiveness were the careful training and ongoing supervision of the helpers (Durlak, 1979). Further, another study found that unsupervised college students were ineffective in addressing the difficulties of elementary school children, whereas carefully supervised college students achieved successful results, equal to those of trained professionals (Karlsruher, 1976). Adult oversight and supervision

may improve treatment fidelity, a construct not often measured or reported on in empirical studies of youth mentoring. Treatment fidelity is defined as the methodology for monitoring and enhancing the accuracy and consistency of an intervention to ensure its accurate implementation, with each component delivered consistently to all participants (Smith et al., 2007). When interventions are supervised and closely monitored, fidelity of program interventions increases, and higher levels of treatment fidelity are associated with better treatment outcomes (Durlak & DuPre, 2008; Schoenwald et al., 2000). Adult supervision provides opportunities for verifying that mentoring interventions are carried out as intended, while also ensuring appropriate mentor-mentee interactions and preventing obstacles to program success (e.g., mentors not understanding their role or carrying out their role ineffectively). Adult oversight and structured activities may be particularly important for youth mentors, given their developmental stage, maturity level, and the potential for negative peer influence (Dishion & Tipsord, 2011; Karcher, 2008; O'Donnell et al., 1979). Additional scaffolding for youth mentors may facilitate clearer expectations of their roles and responsibilities, as well as ensuring adherence to program interventions.

Relatedly, the current meta-analysis found a trend toward larger effects for cross-age peer mentoring programs that targeted specific youth outcomes compared to programs without a targeted focus (i.e., nonspecific, friendship-based models). Of the targeted programs, one focused on violence prevention among youth living in a violent neighborhood, another aimed to improve academic attainment of black adolescent males with high at-risk ratings, two more specifically targeted social and school connectedness, and the fifth aimed to promote healthier patterns of dietary intake and physical activity in a rural population with high rates of childhood obesity (Sheehan et al., 1999, Tomlin, 1994, Karcher et al., 2002,

Karcher, 2005, and Smith, 2011, respectively). Notably, five out of six of the cross-age peer mentoring studies included in the current study were programs that targeted specific outcomes rather than focusing on relationship-building and general positive youth outcomes.

The finding that targeted programs trended toward larger effects is consistent with findings from a recent intergenerational mentoring meta-analysis, which specifically investigated the benefits of targeted versus non-specific/friendship-based models of mentoring (Christensen et al., 2020). Christensen and colleagues' study found that targeted programs (i.e., those that focused on specific youth outcomes based on the population served) were significantly more effective than friendship-based programs (i.e., those focused on relationship-building and non-specific recreational activities) ($g = 0.25$ versus $g = 0.11$). These findings are in line with recent calls from mentoring researchers for stronger alignment with theoretical and evidentiary standards of prevention science, which typically require a close association between structured interventions and identified target problems in youth (e.g., Cavell & Elledge, 2015).

Importantly, relationship-building activities and training are not in opposition to targeted mentoring approaches, and many of the programs coded as "targeted" in both Christensen et al.'s study and the current analysis maintain a focus on the development of strong mentor-mentee bonds in the context of targeted interventions. Even researchers who strongly advocate for more targeted approaches (e.g., Cavell & Elledge, 2015) do not refute that mentoring is a relational intervention and that overly rigid approaches could impair relationship quality and mentees' persistence in the intervention. There is a parallel debate in psychotherapy research about the impact of structured, evidence-based therapies relative to non-specific or "common factors," i.e., therapist warmth, empathy, and support, which are

provided across therapeutic modalities (e.g., Weisz et al., 2017). Meta-analyses of child and adolescent psychotherapy have consistently found that, across treatment orientations, therapist-youth working alliance has a moderate effect size on youth outcomes, even in the context of structured treatments like cognitive behavioral therapy, and that certain relational variables (e.g., counselor empathy, genuineness, and warmth; youth willingness to participate) significantly boost outcomes (Karver et al., 2018; Karver et al., 2006). Training in the universal features of effective helping relationships can ensure a strong foundation for targeted skills development and remediation. The findings of the current study suggest that that relationship-building may be a necessary, but not sufficient, basis for improving mentee outcomes.

The current meta-analysis tested several additional moderators of cross-age peer mentoring effectiveness in an effort to explain the substantial heterogeneity in effect sizes across studies. Larger effects were observed for programs operating in the community or on the weekends/during the summer compared to those that operated within school settings (i.e., during or after the school day). Programs occurring during or after school may be less effective for a variety of reasons. First, given the space constraints in many schools, mentoring programs during the school day often involve matches meeting in groups in a single location on school property. For example, in the study of BBBS school-based mentoring programs, 78% of cross-age peer mentors reported meeting in the school in one large group in locations such as the gym or cafeteria (Herrera et al., 2008). The other school-based programs included in the study were also conducted as one-on-one relationships within a group format (Karcher, 2005; Smith, 2011; Tomlin, 1994). Meeting in a group format could distract matches from intended one-on-one interactions/interventions and lead to

relationships with decreased youth-focus; mentors may direct more attention to each other, rather than their mentees (Herrera et al., 2008). Additionally, some programs that aggregate children have harmful impacts due to "peer contagion," the process by which peers exert mutual influence on each other in a way that negatively impacts emotional and behavioral development (Dishion & Tipsord, 2011). More research is needed to investigate the conditions under which peer contagion occurs and leads to negative youth outcomes, particularly within the context of mentoring programs. Notably, both community-based programs included in the current study also had components conducted within a group setting (Karcher et al., 2002; Sheehan et al., 1999). Thus, there are likely additional factors influencing this finding, and there may be aspects of group settings in the community that contribute to greater effectiveness compared to school settings.

Additionally, some of the studies in the current analysis that operated in school settings took place solely after school or, in the case of the larger BBBS program evaluation, included programs in which matches met after the school day ended (Herrera et al., 2008; Karcher, 2005; Smith, 2011). Mentoring programs occurring after school may pose additional barriers to mentoring effectiveness. After a full day of school, youth may have decreased capacity for concentration and new learning, particularly because children and adolescents are, on average, getting less sleep than recommended (Matricciani, et al. 2012). Fatigue at the end of the school day could limit mentees' ability to attend to their mentors and fully engage in program content, as well as limiting mentors' capacity to deliver interventions successfully. This is not to say that youth should be pulled from class or other instructional activities during the school day for mentoring purposes, which could have detrimental effects on school performance. As mentoring researchers and practitioners

continue to design and evaluate mentoring programs, it will be important to attend to youths' needs and determine contextual factors such as time, location, and group versus individual format that may impact program effectiveness.

School-based mentoring has become one of the most popular contexts in which youth receive mentoring services (Garringer et al., 2017). The current study indicates that researchers and program administrators may need to re-evaluate this model, at least in the context of peer mentoring, and explore community-based options. Further research is needed to determine why school-based cross-peer mentoring programs are relatively less effective than those operating in the community and what contextual and programmatic factors may lead to these discrepancies.

Larger effects were also observed for mentees engaged in programs in urban settings compared to rural settings. Programs in urban settings may serve youth who experience increased risk factors such as exposure to high rates of crime, violence, delinquency, substance use, and poverty (Black & Krishnakumar, 1998). Past mentoring research has demonstrated a particular need for mentoring in urban settings with high-risk youth (Carswell et al., 2009; Petitpas et al., 2004). A 2011 intergenerational mentoring meta-analysis demonstrated that stronger program effects were associated with programs serving youth with greater levels of individual and environmental risk (Dubois et al., 2011). Additional research supports the theory that mentoring programs may be particularly effective for youth who initially report higher risk for negative outcomes (Dubois et al., 2002; Poon et al., submitted for publication). This research supports the relevance of the "pendulum" theory of change for youth mentoring programs, i.e., that more vulnerable youth have the most room for improvement (Tanner-Smith et al., 2018).

The current study coded for individual and environmental risk factors. However, these factors were not reported in most studies and therefore could not be included as moderators. It can be observed, though, that of the studies serving youth in urban settings in the current meta-analysis, one was a mentoring program aimed at violence prevention among youth living in a violent neighborhood, another aimed to improve academic attainment of black adolescent males with high at-risk ratings, and the third served youth in school districts with the highest dropout rates in the city (Sheehan et al., 1999, Tomlin, 1994, and Karcher et al., 2002, respectively). These programs targeted the specific risk factors of the populations they served, which may explain the increased benefit to youth in these programs. By targeting specific risk factors, programs can implement interventions that directly address the problems youth are facing, with the intention of creating sustained and meaningful change. Beyond a supportive relationship, youth living in urban settings may benefit from relationships that enhance specific skills oriented toward their needs and context. Future research should continue to assess whether youth with greater environmental and personal risk benefit more from cross-age peer mentoring interventions. Additionally, future studies should investigate whether specific aspects of programs in urban settings (e.g., targeting specific risk factors) increase program effectiveness.

Inconsistent with prior meta-analyses, the current study found that school records yielded higher effect sizes compared to mentee and teacher self-report measures (Cheung & Slavin, 2015; Raposa et al., 2019). School records consisted of measures of grade point average, absences, suspensions, office referrals, and achievement test scores. That school records showed significantly higher effects indicates the differential impact of cross-age peer mentoring programs on objective behavioral and achievement outcomes compared to

mentee- and teacher-reported observations and attitudes. These results reflect the effectiveness of cross-age peer mentoring on specific behavioral and academic outcomes, possibly due to skills-based interventions that targeted those outcomes. In fact, both studies that utilized school records specifically targeted school-related and achievement outcomes through their mentoring programs (Karcher et al., 2002; Tomlin, 1994). These findings also suggest that cross-age peer mentoring interventions may be a less effective means for affecting change in mentee and teacher perceptions and attitudes, or that change is not well captured by these measures. It is possible that mentees' school-related behavior may improve, without corresponding attitudinal changes. Additionally, teacher ratings of youth conduct and classroom effort can be impacted by contextual factors such as racial bias, and thus may not always provide an accurate portrayal of youth behavioral change. For example, past research has demonstrated that students of color are more likely to be viewed by teachers as disruptive or inattentive, and teachers rate behavioral incidents as more troubling and deserving of disciplinary consequences if the student is Black compared to if the student is White (Dee, 2005; Okonofua & Eberhardt, 2015). It will be important for future research to examine how to improve the impact of cross-age peer mentoring on mentee and teacher-reported attitudes, as well as determining any contextual factors that interfere with accurate behavioral and attitudinal ratings.

Mentoring researchers and practitioners should be aware that the types of assessments they choose, regardless of the construct being measured, could influence their evaluation of mentoring program effectiveness. Therefore, it is helpful to incorporate a variety of measure informants, incorporating data from multiple sources to provide a comprehensive understanding of changes in youth outcomes. Interestingly, none of the studies included in

the current analysis included parent report measures. Future studies should investigate the impact of cross-age peer mentoring programs on parent-reported outcomes, such as youth behavior and attitudes in the home environment. These findings would provide important insights into the impact of cross-age peer mentoring on mentee-parent relationships, as well as parent perspectives on the effectiveness of these programs.

Finally, the current study found a trend towards differences in program effects based on sample size, with programs with larger sample sizes yielding smaller effects. This finding did not reach significance and the effect size was very small (-.002); therefore, it should be interpreted with caution. Notably, the study with the largest sample size – over 400 participants – was Herrera et al.'s (2008) BBBS high school mentors study, which yielded the lowest overall effect size (.03) of studies included in the analysis. Ensuring ample staffing, sufficient match support, and strong intervention adherence is inherently more challenging for large-scale programs. Programs with higher numbers of participants, especially those that are implemented across multiple sites, may experience increased difficulty maintaining treatment fidelity, particularly when interventions lack a specific focus and consistent oversight as was the case for the BBBS programs. Further, given that the BBBS programs utilized the nonspecific friendship model of mentoring, lower effectiveness could be indicative of an ineffective approach implemented across a largescale organization. Future research should examine strategies for supporting program expansion to serve larger populations of youth, while continuing to ensure program fidelity and adequate training of staff and mentors.

Consistent with the intergenerational youth mentoring literature (DuBois et al. 2002, Dubois et al., 2011; Raposa et al., 2019), the effectiveness of mentoring did not appear to

vary significantly based on mentee race or age. Additionally, no significant differences were observed based on mentor or mentee gender. The latter finding contrasts with findings from recent intergenerational mentoring meta-analyses, which found larger effects for programs serving a higher percentage of male youth (Dubois et al., 2011; Raposa et al., 2019). Given the small sample size of studies in the current analysis, continued research is warranted to determine whether mentee and mentor demographic variables impact youth outcomes in cross-age peer mentoring evaluations.

Study Limitations

There are several limitations to the current analyses. First, meta-analyses are dependent on the type, quality, and availability of information included in the analyses. While the present analyses included many methodological factors as moderators of study outcomes, issues such as reporter bias or unreliable or poorly validated measurement tools in the original studies may have impacted observed effect sizes for these studies. In addition, moderators could only be analyzed for studies that reported on these variables. Certain moderators identified as potentially relevant based on previous research or theory on intergenerational or cross-age peer mentoring could not be tested in the current study because of lack of consistent reporting of these variables. In addition, meta-analyses aggregate findings across many populations and program structures, and there was substantial heterogeneity across the studies included in the current analyses. Multiple moderators were tested to attempt to account for this heterogeneity. However, further research is needed to continue to elucidate the program practices that are most effective for various youth populations and specific youth outcomes. As this literature grows, future meta-analyses

should analyze additional relevant moderators from the mentoring literature and investigate complex interactions between moderating variables (Raposa et al., 2019).

In the present meta-analysis, only evaluations written in English were coded and included in the analysis. Therefore, although most studies screened were written in English, other evaluations were excluded based purely on language of publication. Moreover, the studies that met criteria for inclusion were all conducted in the United States. Therefore, the present findings may not generalize to cross-age peer mentoring programs outside of the United States. Future research should explore the various factors that may uniquely influence cross-age peer mentoring programs in other countries, including cultural and demographic variables.

Additionally, because youth mentors had to be at least two years older than their respective mentees per the definition of cross-age peer mentoring, this necessarily constrained the age of mentees participating in the included evaluations. While many intergenerational youth mentoring evaluations include high schoolers as mentees, mentee age in evaluations included in the current study necessarily skewed younger, with high schoolers generally serving as mentors to elementary- or middle school-age youth. Therefore, the current analysis could not determine the impact of cross-age peer mentoring on high school-aged youth compared to elementary- and middle-school-aged youth, and did not find any effects of age on mentoring effectiveness. There is some evidence that intergenerational youth mentoring may be more effective with mid- to late-elementary school-aged children, compared to adolescent mentees (Kupersmidt et al., 2017). Future research should continue to investigate whether and how mentor and mentee age impact cross-age peer mentoring program effectiveness, including whether younger mentees show stronger results.

Additionally, evaluations of mentoring programs with late high school or early college-age mentors working with high school mentees could demonstrate the impact of peer mentoring on high school youth.

Another limitation to the current study is that the funnel plot analysis showed some indication of publication bias. Fourteen effect sizes were missing at the left side of the of the funnel plot. Accounting for publication bias by means of a trim and fill analysis yielded a smaller non-significant mean effect size of Hedges' g= 0.19 (p = .36). However, the funnel plot method assumes homogeneity of the overall effect size, an assumption which was violated in the current study. Therefore, this finding should be interpreted with caution. Additionally, findings from the leave-one-out sensitivity analyses indicated that the overall effect remained significant after each rerun; therefore, none of the studies had an individual, disproportionate, impact on the overall findings. The sensitivity analyses show the validity and robustness of the overall meta-analytic results and demonstrate that no individual study had an excessive impact on the overall effect size. Furthermore, the best way to protect against publication bias is to include all clinical trials in the analysis, including unpublished reports and dissertations. Studies that do not support the effectiveness of cross-age peer mentoring programs might be less likely to appear in peer-reviewed journals, thereby influencing interpretation of results. The current study accounted for this and protected against publication bias by specifically searching for reports and unpublished dissertations in the process of the literature search and including these types of evaluations in the analyses. Future meta-analyses of cross-age peer mentoring evaluations should also endeavor to include all studies and reports, regardless of publication status, in order to determine an

accurate overall effect size, as well as accurate moderator analyses, for cross-age peer mentoring studies.

A final limitation is that only six studies met the inclusion criteria for the current study. Due to the small number of program evaluations, there may not have been sufficient power to find significant effects of certain moderator analyses. The current study utilized Karcher and Berger's (2017) definition of cross-age peer mentoring, wherein the term "peer" conveys that the relationship includes two individuals within the same generation, thereby differentiating the relationship from an intergenerational one. By limiting the inclusion criteria to fit this definition, the current study aimed to fill a specific gap in the literature, investigating the impact youth mentors have on younger peers and determining the effectiveness of cross-age peer interventions within the mentoring field. As additional cross-age peer mentoring programs are implemented and evaluated, a follow-up meta-analysis should further evaluate overall effectiveness of cross-age peer mentoring programs, as well as moderator variables that impact mentee outcomes.

Despite these limitations, this study provides the first meta-analytic assessment of the overall impact of one-on-one, cross-age peer mentoring relationships, including moderators of program effectiveness. The current study offers encouraging evidence for the effectiveness of cross-age peer mentoring interventions.

Conclusions and Future Directions

The results of the present study suggest that cross-age peer mentoring is a promising intervention with significant youth outcomes. Results of moderator analyses indicated several program characteristics that increase the effectiveness of cross-age peer mentoring programs, including programs that are community-based, conducted in urban settings, demonstrate

moderate to high levels of adult oversight and supervision, target specific youth outcomes, and have smaller sample sizes.

These findings indicate the positive influence of older youth on younger youth outcomes. While mentoring programs often focus on pairing adult mentors with youth mentees, the current study indicates the important impact of cross-age peer mentors, specifically when mentors are provided with adequate training, supervision, and oversight during program implementation. Cross-age peer mentoring is an appealing intervention due to the ease in recruiting and training high school mentors, as well as high school students' abilities to connect with younger youth (Cavell et al., 2018). Increased implementation of cross-age peer mentoring programs is a promising path to scale supplemental and preventative services to youth. Positive peer influence and role modeling of effective skills use in the context of mentoring interventions have the potential to reduce the negative progression of problems in younger youth, while providing an enriching and rewarding experience for youth mentors. Given the small sample size of studies, future experimental evaluations on cross-age peer mentoring programs are needed. These programs should employ robust experimental methods with control groups, rather than purely pre-post analyses, in order to be included in future cross-age peer mentoring meta-analyses. In addition, further research is needed on the impact of cross-age peer mentoring on youth mentors, as some positive outcomes for mentors have been indicated (Coyne-Foresi & Nowicki, 2020; Sheehan et al., 1999), which further supports the implementation of these interventions.

Results from the current study found an overall medium effect size for cross-age peer mentoring programs, an effect size more than twice as large as a recent intergenerational

youth mentoring program meta-analysis (Raposa et al., 2019), a noteworthy finding for the field of mentoring research. That youth mentors can be this effective may at first be perplexing, but moderator analyses reveal why specific peer mentoring programs show such strong effects. Many peer mentoring programs included in the analysis demonstrated targeted approaches with strong oversight of youth mentors. This is consistent with Christensen et al.'s (2020) findings that targeted approaches are more effective for intergenerational youth mentoring programs. Nonspecific, relationship-based models of mentoring may be less effective than programs that target specific youth outcomes and provide supervision and training throughout the duration of the program.

Currently, there is inconsistency among mentoring programs in adherence to empirically supported program practices (e.g., recruitment and training strategies) recommended by organizations such as the National Mentoring Resource Center or MENTOR's Elements of Effective Practice for Mentoring (Garringer et al., 2015). Implementing evidence-based practices has the potential to increase match length (Kupersmidt et al., 2017), thereby increasing the likelihood of positive youth outcomes (Grossman et al., 2012; Herrera et al., 2011). Moreover, mentoring programs and researchers can partner to shift from non-specific, friendship-based approaches/activities to focused interventions that target specific youth outcomes and operate under a structure of consistent oversight to ensure adherence to program interventions with strong empirical foundations (McQuillin & Lyons, 2016; Weiler et al., 2017).

To this end, research on after-school programs for youth can inform mentoring program practices. A meta-analysis of youth after-school programs targeting personal and social skills demonstrated that programs that implemented four recommended practices

demonstrated significant program effects (Durlak et al., 2010). The four practices were as follows: 1) using a sequenced step-by-step training approach (e.g., lesson plans, manuals, program curricula), 2) emphasizing active forms of learning, including skills practice, 3) focusing time and attention on skills training, and 4) explicitly defining learning objectives. Programs that did not implement all four practices did not yield significant mean effects. These findings indicate that after-school programs can be effective if they take a targeted, skills-based approach that emphasizes specific goals and active learning. Implementation of after-school mentoring programs can be informed by these findings, which demonstrate a promising approach for structuring effective school-based interventions.

Future research should continue to investigate factors that increase effectiveness for mentoring programs in school and community settings, as well as barriers that impede the success of these programs, particularly school-based programs as these were shown to be less effective in the current study. Ongoing research and implementation of evidence-based practices are needed to determine how specific elements, such as level of oversight, program setting, and various elements of interventions impact youth outcomes in cross-age peer mentoring programs, as well as whether these components similarly or differentially influence youth outcomes within intergenerational mentoring frameworks.

As the field continues to incorporate findings from recent evaluations on evidence-based approaches and moves away from non-specific programs, it should also resist swinging too far in the other direction. Disregarding the relational components of mentoring would be a mistake; these factors clearly play an important role in building and maintaining strong relationships. Mentors need to be trained not only in the implementation of program interventions, but in relational strategies for implementation (Karcher & Berger, 2017).

Similarly, adult oversight need not become directive or regulatory to the point that adults are controlling all aspects of mentor-mentee interactions, i.e., "helicopter" supervisors. Programs should balance providing close supervision with allowing appropriate match independence in order to be an asset to mentoring relationships rather than a burden (Karcher & Berger, 2017). Programs should endeavor to integrate best practices based in research on various mentoring approaches. Programs can support the growth of strong and healthy mentoring relationships while also ensuring adherent delivery of targeted program interventions.

In conclusion, in recent decades, mentoring programs have become increasingly prevalent interventions for supporting youth experiencing a range of academic, behavioral, and emotional difficulties. While the dominant "friendship-based" model of intergenerational youth mentoring programs assumes that a supportive relationship between mentor and mentee will promote positive development and prevent a range of negative outcomes, the current meta-analysis of cross-age peer mentoring programs suggests the effectiveness of a different approach for peer interventions. Most of the studies included in the analyses targeted specific youth outcomes and incorporated moderate to high levels of adult oversight and supervision for mentors. These findings support a recent call for programs to incorporate skills teaching in the context of mentorship to address skills needs presented by mentees (Christensen et al., 2020; Rhodes, 2020).

It is essential to continue to explore for whom cross-age peer mentoring is most effective and which program practices strengthen or diminish the effects of cross-age peer mentoring. Taken together, the current findings provide support for the efficacy of one-on-one, caring relationships with older peers who are closely supervised by adults, particularly as a low-cost intervention with the potential to reach large groups of youth and prevent more

intensive treatments. These findings also highlight opportunities for improving the quality and rigor of mentoring practice, particularly moving toward skills-based interventions with strong attention to oversight and intervention fidelity. Future programs should endeavor to build on the current findings by creating supportive, scaffolding environments for youth mentors, thereby facilitating increased mentor competency and intervention adherence, as well as fostering mentee success.

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