



Pathways of influence in school-based mentoring: The mediating role of parent and teacher relationships[☆]

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ABSTRACT

This study explores the pathways through which school-based mentoring relationships are associated with improvements in elementary and high school students' socio-emotional, academic, and behavioral outcomes. Participants in the study ($N=526$) were part of a national evaluation of the Big Brothers Big Sisters school-based mentoring programs, all of whom had been randomly assigned to receive mentoring at their schools over the course of one academic year. Students were assessed at the beginning and end of the school year. The results of structural equation modeling showed that mentoring relationship quality, as measured by the Youth-Centered Relationship scale and the Youth's Emotional Engagement scale, was significantly associated with positive changes in youths' relationships with parents and teachers, as measured by subscales of the Inventory of Parent and Peer Attachment, the Teacher Relationship Quality scale, and the Hemingway Measure of Adolescent Connectedness. Higher quality relationships with parents and teachers, in turn, were significantly associated with better youth outcomes, including self-esteem, academic attitudes, prosocial behaviors, and misconduct. The effect sizes of the associations ranged from 0.12 to 0.52. Mediation analysis found that mentoring relationship quality was indirectly associated with some of the outcomes through its association with improved parent and teacher relationships. Implications of the findings for theory and research are discussed.

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1. Introduction

Mentoring relationships have long been recognized as holding significant potential for promoting improved behavioral, social-emotional, and academic outcomes among youth (Rhodes, 2005). Although specific definitions vary, youth mentoring tends to be defined as a trusting relationship between a young person and an older, more experienced non-parental figure who provides guidance, support, and encouragement to the mentee (DuBois & Karcher, 2005). Among the various formal approaches to youth mentoring, school-based mentoring (SBM) is the most common in the United States, surpassing traditional community-based mentoring (CBM) and serving hundreds of thousands of vulnerable students across the country (Karcher & Herrera, 2007). In contrast to the more traditional CBM matches, in which the matches meet in the mentees' neighborhood settings over the course of a calendar year, SBM matches meet in the mentees' school settings, typically during lunch or after

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school, over the course of an academic year. The mentor and mentee engage in a range of activities together, including talking, playing games, and academic-related tasks such as homework or reading. As in CBM, SBM mentors participate in pre-match screening, orientation, and training, and are expected to meet with mentees on a weekly basis. SBM's strong appeal stems from its potential to reach youth who might not be referred by their parents and to connect a broad array of community members with youth's daily academic and social experiences in the school setting, potentially improving youth's experience in and outlook on school. Although findings from recent mentoring evaluations have been mixed, secondary analyses suggest substantial variability across different subgroups of youth, highlighting the importance of attending to the moderators and underlying processes that might influence youth outcomes. In the current study, we investigated the role of improved parent and teacher relationships in fostering positive outcomes among youth involved in the Big Brothers Big Sisters (BBBS) SBM program.

1.1. Background

Researchers have suggested that mentoring can promote children and adolescents' social and emotional development (Rhodes & Lowe, 2009). In particular, positive mentoring relationships are thought to facilitate emotional regulation and to improve youths' social skills and self-perceptions. By providing consistent support, for example, mentors can challenge negative views that youth may hold of themselves and demonstrate that positive relationships with adults are possible. In this way, a mentoring relationship can become a "corrective experience" for youth who have experienced unsatisfactory relationships with parents or other caregivers. In some instances, positive mentoring relationships might have this effect by increasing the security of youths' attachment models. Indeed, although attachment styles formed in early experiences with primary caregivers are thought to be relatively stable throughout childhood and beyond (Ainsworth, 1989; Bowlby, 1988), they can be modified by life circumstances, including engagement in unconditionally supportive relationships with caring nonparent adults (Belsky & Cassidy, 1994; Sroufe, 1995). In doing so, positive socio-emotional experiences with mentors are thought to generalize, enabling youth to interact with other adults more effectively (Rhodes, 2005).

Research findings have provided support for such processes. Mentoring relationships have been linked to improvements in youths' perceptions of their parental relationships, including levels of intimacy, communication, and trust (DuBois, Neville, Parra, & Pugh-Lilly, 2002; Karcher, Davis, & Powell, 2002; Rhodes, Grossman, & Resch, 2000; Rhodes, Reddy, & Grossman, 2005; Spencer, 2006). Relational improvements that stem from involvement in mentoring programs, in turn, have been linked to improvements in self-worth, perceived scholastic competence, and academic achievement (Karcher et al., 2002; Rhodes et al., 2000), as well as decreases in substance use (Rhodes, Reddy, & Grossman, 2005).

Although most research on mentoring relational processes has been conducted within the context of CBM, it is likely that similar processes underlie SBM. Moreover, because mentors working within schools are in relatively frequent contact with their mentees' teachers (Herrera, Sipe, & McClanahan, 2000), these relational processes might extend to both parents and teachers. School-based mentors, for example, may focus teachers' attention on particular students and help realign the youngsters' attitudes toward teachers. The fact that many matches complete schoolwork during their time together can also help promote more positive interactions between teachers and youth. Improvements in students' perceptions of teacher support, in turn, can influence students' motivation to achieve in school (Allen, Pianta, Gregory, Mikami, & Lun, 2012; Patrick, Anderman, & Ryan, 2002) and their interest in, enjoyment from, and value placed on schoolwork (Fraser & Fisher, 1982; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002; Midgley, Feldlaufer, & Eccles, 1989; O'Connor, 2010).

The relationship processes described above are complex, sometimes involving shifts in children's basic orientation to their closest relationships. As such, they are likely to occur only within the context of close mentoring relationships. Matches vary considerably in their effectiveness, depending on the quality of the relationships. Without some connection, the dynamics that make mentoring relationships effective are unlikely to occur. Indeed, after surveying over 600 mentors, Herrera et al. (2000) hypothesized that "at the crux of the mentoring relationship is the bond that forms between the youth and mentor. If a bond does not form, then youth and mentors may disengage from the match before the mentoring relationship lasts long enough to have a positive impact on youth" (p. 31). Such feelings of closeness in formal mentoring ties have been found to mediate linkages between other relationship characteristics and perceived benefits for the youth (Parra, DuBois, Neville, Pugh-Lilly, & Povinelli, 2002) and, in informal mentoring, have predicted favorable youth outcomes in areas such as mental health and substance use independent of frequency of contact and relationship duration (DuBois & Silverthorn, 2005). Close emotional connections between youth and mentors appear to be fostered by factors resembling those identified as important in effective therapeutic relationships, such as empathy, authenticity, and attunement (Spencer, 2006). This assumption is consistent with research that underscores the benefits of emotional attunement and consistency in youths' relationships with parents, teachers, and other adults (Pianta, 1999), including mentors (Deutsch & Spencer, 2009; Keller & Pryce, 2010; Spencer & Rhodes, 2005; Thomson & Zand, 2010).

Although close mentoring relationships hold significant potential for influencing a range of youth outcomes, findings from recent random assignment impact evaluations of SBM have produced mixed results (Bernstein, Rappaport, Olsho, Hunt, & Levin, 2009; Herrera, Grossman, Kauh, Feldman, & McMaken, 2007; Herrera, Grossman, Kauh, & McMaken, 2011; Karcher, 2008). In particular, a national evaluation of the BBBS SBM programs revealed significant improvements in mentored students' academic performance, perceived scholastic efficacy, school misconduct, and attendance relative to a control group of non-mentored youth (Herrera et al., 2011). These effects were generally small in magnitude, however, and when re-assessed a few months into the following school year, most had eroded to nonsignificance. Importantly, however, mentees who experienced longer relationships and relationships of higher quality (as defined by measures of closeness, satisfaction, and engagement in their relationships)

derived more benefits than those in shorter or lower quality relationships (Herrera et al., 2007). In an evaluation of a Communities In Schools SBM program, Karcher (2008) found small but positive effects on self-reported connectedness to peers, self-esteem, and social support but no academic effects. Finally, Bernstein et al. (2009) evaluated a wide range of SBM mentoring programs funded through the Department of Education's Student Mentoring Program and found no significant treatment effects on any of the three outcome domains assessed (i.e., prosocial behavior, problem behavior, academic achievement). Aggregating across these three studies, Wheeler, Keller, and DuBois (2010) concluded that SBM was associated with slight improvements in students' perceptions of support and scholastic efficacy, school-related misconduct, absenteeism, and truancy, with effect sizes ranging from $d = 0.07$ to 0.18 . Program effects were not apparent, however, for academic achievement.

More recently, DuBois, Portillo, Rhodes, Silverthorn, and Valentine (2011) conducted a meta-analysis that encompassed 73 independent evaluations of youth mentoring programs, including both SBM and CBM. Overall, the findings support the effectiveness of mentoring for improving outcomes in multiple domains of youth functioning, including academic achievement test scores. At the same time, however, the overall effect size of across programs was relatively modest ($d = 0.21$), and effectiveness varied considerably across different programs.

Researchers have also conducted secondary analysis of the BBBS SBM evaluation data to identify moderators of influence. A range of youth and mentor characteristics, including youth age (Herrera et al., 2011), the quality of youth's baseline relationships (Schwartz, Rhodes, Chan, & Herrera, 2011), and positive mentor expectations (Karcher, Davidson, Rhodes, & Herrera, 2010) have been shown to be associated with youth outcomes in SBM. In addition, match length and match integrity (Grossman, Chan, Schwartz, & Rhodes, 2012) predicted youth outcomes in SBM, with relationships lasting at least 24 weeks and relationships that were still intact at the end of the school year being associated with improved youth outcomes.

Taken together, these studies suggest that although the typical SBM relationship offers only modest benefits to students, higher quality mentoring relationships and programs are associated with stronger effects. In addition to identifying the factors associated with stronger, more effective relationships, it is important to investigate the underlying processes by which such outcomes are achieved. Through such studies, researchers can gain insight into the processes through which the quality of mentoring relationships influences developmental outcomes. Understanding these processes—in essence, getting to the heart of the change process—is critical to advancing a more scientifically informed and practically applicable understanding of youth development and resilience.

1.2. The current study

Using data from a large BBBS SBM evaluation study (Herrera et al., 2011), the current study builds on previous findings from CBM to explore how SBM relationships affect a range of youth outcomes, including academic attitudes, self-esteem, misconduct, grades, and prosocial behavior. Consistent with previous research and theory on CBM (Rhodes et al., 2000; Rhodes, Reddy, & Grossman, 2005; Spencer, 2006), we hypothesize that the effects of high-quality relationships on positive youth outcomes will be mediated through their positive influence on parental relationships. In light of the school context, we hypothesize that these effects will also be mediated through their positive influence on teacher–student relationships.

2. Method

2.1. Participants

This study drew on data collected for a large-scale evaluation of BBBS SBM programs (Herrera et al., 2007; Herrera et al., 2011). Participants in the study include 526 youth who were randomly assigned to the treatment group and had been matched with a mentor. Youth assigned to the control group ($n = 574$) and those in the treatment group who had never been matched ($n = 39$) were not included in the current study because the goal of the study is to examine the ways in which mentoring relationship quality is associated with youth outcomes. Participants were in fourth through ninth grade at the start of the study in September 2004. The final sample was 54.2% girls and ranged in age from 9 to 17 years ($M = 11.15$, $SD = 1.57$), the majority of whom (84.8%) were with the age span of 9 and 12. More than half (63.1%) of the students were in elementary school, 32.7% were in middle school, and the remaining 4.2% were in grade 9. A total of 53.4% of youth identified as racial/ethnic minorities, with 26.4% identifying as Hispanic, 24.3% as African American, 12.0% as Native American, 1.5% Asian, and 4.4% as “other.”

2.2. Procedure and intervention

2.2.1. Recruitment

Ten BBBS local agencies were selected based on geographical diversity, track-record (e.g., being in operation for at least four years, having strong leadership in place, and serving at least 150 youth), and inclusion of different types of volunteer populations (e.g., high school students and employees from local businesses). Participating youth were recruited to SBM programs through the usual BBBS procedures, with most referred by school staff. Baseline surveys (T1) were administered at the beginning of the academic year, as youth applied to the program, to a total of 1,139 youth and 1,009 teachers of those youth in 67 schools.

2.2.2. Surveys

Youth baseline surveys were administered at schools under the guidance of researchers in groups of 3 to 10 students, and teacher surveys were self-administered. Subsequent to the baseline survey, students were randomly assigned either to the treatment group to be matched with a mentor or to the control group to be placed on agency waiting lists until the end of the study.

Follow-up student and teacher data were collected in the spring of the school year (T2; 1,067 youth surveys and 959 teacher surveys). Follow-up surveys for youth were administered by a survey firm at the schools or by phone for youth who had moved or were absent on the day of survey administration. Teacher follow-up surveys were self-administered.

2.2.3. Mentors

At the time of the follow-up surveys, 93% of youth had been matched with a mentor. There were 496 mentors with an average age of 24.6 (SD = 12.1); 44.8% were under age 18. The majority were female (72.2%) and White (76.5%), with 7.5% identifying as African American, 6.3% as Hispanic, 3.9% as multiracial, 3.4% as Asian, 1.6% as Native American, and 0.6% as "other." Among the 90.3% of mentors who reported their education status, 49.7% were high school students and 15.6% were college students. The remaining 34.5% were not students. Among the high school students, 75% were in Grades 11 or 12.

By the time of the follow-up surveys, most (85.4%) mentors had been matched with one youth, and after the unexpected termination of the previous relationships, 11.3% and 3.3% of the mentors had worked with two and three mentees, respectively. The BBBS programs included in the current study varied in their volunteer recruitment sources, with most of them coming from partnering businesses and schools (Herrera et al., 2007). Matches between the mentor–mentee dyad were arranged by case managers at the BBBS agencies. A range of criteria were used, including the social needs of the youth and the corresponding skills of the mentor, youth's academic needs, and the interests of the youth and mentor.

2.3. Mentoring

Although mentors commit to meeting with youth for one school year (i.e., 9 months), matches generally begin after the start of the school year because of the time taken for recruitment, screening, and training of volunteers, and school scheduling. As a result of late starts as well as, in some cases, early terminations, at the time of the follow-up survey, youth had received an average of 5.1 months (SD = 1.7) of mentoring. In addition, whereas the majority of programs (79%) asked mentors to meet on a weekly basis, some programs required less frequent meetings. As a result, on average, mentors and youth met 3.1 times per month during the time they were matched. Details of the procedure can be found in Herrera et al. (2007). Because the current study concerns the influence of the quality of mentoring relationships, the current analysis is based on the 526 youth in the treatment group who had been matched with a mentor and had completed both the baseline and follow-up surveys.

2.4. Measures

2.4.1. Mentor relationship

Quality of mentor relationship was measured with two youth-reported scales at only T2: Youth-Centered Relationship (Jucovy, 2002) and Youth's Emotional Engagement (Rhodes, Reddy, Roffman, & Grossman, 2005). The Youth's Emotional Engagement scale was developed and validated for a diverse of population of youth ages 9 through 15 years old in BBBS CBM programs (Rhodes, Reddy, Roffman, et al., 2005). Higher scores indicate better relationship quality. Youth-Centered Relationship was measured using a five-item scale including items such as "My mentor almost always asks me what I want to do" ($\alpha = .70$). Youth Emotional Engagement was measured using an eight-item youth-reported scale including items such as, "When I'm with my mentor, I feel excited" ($\alpha = .85$). Both measures were rated on a 4-point scale, ranging from 1 = not at all true to 4 = very true, with higher scores indicating more positive relationships.

2.4.2. Teacher relationship

Quality of teacher–student relationship was measured using two youth-reported scales at both T1 and T2: an adapted version of the Teacher Relationship Quality scale (Midgley et al., 1989) and the Teacher Connectedness subscale from the Hemingway Measure of Adolescent Connectedness (MAC; Karcher, 2003). The Teacher Relationship Quality scale contains five items, such as "I get along well with my teachers this year" ($\alpha = .74$ at T1, $\alpha = .78$ at T2). The Teacher Connectedness subscale contains six items, including "I care what my teachers think of me" ($\alpha = .64$ at T1, $\alpha = .65$ at T2). The items on both scales were rated on a 4-point scale, ranging from 1 = not at all true to 4 = very true, with a higher score indicating a more positive teacher–student relationship. The MAC has shown good psychometric properties across diverse populations (Karcher, 2003; Karcher & Lee, 2002).

2.4.3. Parent relationship

Quality of parent relationship was assessed using two youth-reported subscales of the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987) at both T1 and T2: Parent Trust (PT) and Parent Communication (PC). The IPPA has been used with youth ages 12–20 and has demonstrated good psychometric properties, including concurrent validity and internal consistency (Armsden & Greenberg, 1987). Respondents indicate the level of support felt in the relationship with their parent or guardian. For example, youth were asked to rate how often they feel that their parent accepts them as they are or how often they feel that their parent trusts their judgment. Responses are rated on a 4-point scale, ranging from 1 = *hardly ever* to 4 =

pretty often (PT: $\alpha = .83$ at T1, $\alpha = .86$ at T2; PC: $\alpha = .75$ at T1, $\alpha = .81$ at T2). A higher score indicates a more positive parent–child relationship.

2.4.4. Misconduct

Misconduct was measured at both T1 and T2 using 11 questions from Brown, Clasen, and Eicher (1986; adapted by Posner & Vandell, 1994) that ask youth how often in the past 3 months they have engaged in 11 misbehaviors including, “broken something on purpose” and “getting into a fight in your neighborhood.” Items were rated in a 5-point scale ranging from 1 = I have never done this to 5 = I did it 5 or more times in the last 3 months. The items were then coded into 1 = the behavior occurred at least once and 0 = the behavior did not ever occur. The Kuder–Richardson-20 coefficient was .77 at T1 and .76 at T2.

2.4.5. Prosocial behavior

Prosocial behavior was assessed at both T1 and T2 using a five-item youth-reported scale asking students to report how frequently they exhibited behaviors such as “helped other students solve a problem” or “given someone a compliment” (Posner & Vandell, 1994). Items were rated on a 5-point scale ranging from 1 = I have never done this to 5 = I did it 5 or more times in the last 3 months, with higher scores indicating more frequent prosocial behavior ($\alpha = .72$ at T1, $\alpha = .69$ at T2).

2.4.6. Academic attitudes

Academic attitudes was measured at T1 and T2 using two youth-reported scales: School Connection scale (Eccles, Early, Fraser, Belansky, & McCarthy, 1997) and the School Connectedness subscale from the MAC (Karcher, 2003). The School Connection scale consists of three statements, such as “I look forward to going to school every day” ($\alpha = .79$ at T1, $\alpha = .75$ at T2). It has been shown to be associated with a range of behavioral and psychological outcome among 7th Grade boys and girls (Eccles et al., 1997). The School Connectedness scale contains six statements, such as, “Doing well in school is important to me” ($\alpha = .69$ at T1, $\alpha = .71$ at T2). On both scales, respondents were asked to rate their level of endorsement using a 4-point scale, ranging from 1 = not at all true to 4 = very true.

2.4.7. Self-esteem

Self-esteem was assessed at T1 and T2 using three youth-reported scales. Self-Perceptions of Academic Abilities is a six-item subscale of an adapted version of the Self-Perception Profile for Children (SPPC; Harter, 1985). The items assess youth's estimation of their own academic competence (e.g., “I feel that I am just as smart as other kids my age”). The adapted version of the SPPC uses a 4-point scale, ranging from 1 = not at all true to 4 = very true, with higher scores reflecting higher levels of self-perceived academic abilities ($\alpha = .75$ at T1, $\alpha = .75$ at T2). Social Acceptance is a six-item subscale of the SPPC (Harter, 1985) containing statements assessing how accepted youth feel by their peers (e.g., “I am popular with others my age”). The SPPC has demonstrated internal consistency and factorial validity among youths in elementary and middle school (Schumann et al., 1999). As noted previously, the adapted version of the SPPC uses a 4-point scale ranging from 1 = not at all true to 4 = very true, with higher scores indicating greater levels of perceived peer acceptance ($\alpha = .67$ at T1, $\alpha = .71$ at T2). Global Self-Worth is an eight-item subscale of the Self-Esteem Questionnaire (DuBois, Filner, Brand, Phillips, & Lease, 1996) that measures youth's self-worth. The scale has demonstrated internal consistency reliability and factorial, convergent, and discriminant validity evidence among youth of diverse racial backgrounds in Grades 5–8 (DuBois et al., 1996). Youth respond to items such as, “I am happy with the way I can do most things” on a 4-point scale where 1 = not at all true and 4 = very true. Higher scores reflect more positive self-evaluations ($\alpha = .72$ at T1, $\alpha = .77$ at T2).

2.4.8. Grade

Overall academic performance (T1 & T2) was rated by teachers using a single-item 5-point scale, ranging from 1 = below grade level to 5 = excellent (adapted from Pierce, Hamm, & Vandell, 1999).

2.5. Statistical analyses

First, a multiple-group confirmatory factor analysis (CFA) was used to examine the measurement and structural properties (i.e., population heterogeneity) of the latent variables. In order to determine if potential subgroups (i.e., male and female and elementary and middle/high school students) could be collapsed into one, measurement invariance was evaluated under three different conditions. The following steps were used to assess invariance: (1) two-group configural model assessment, (2) test of equal factor loadings (i.e., weak measurement invariance), and (3) test of equal intercepts (i.e., strong measurement invariance). This procedure involves testing a series of nested models with a less restricted model compared to a more restricted model (i.e., more degrees of freedom). To assess the significance of each comparison, we evaluated if (a) the change in Comparative Fit Index (CFI) was $\leq .01$ (Cheung & Rensvold, 2002) and (b) the Root Mean Square Error of Approximation (RMSEA) value of the nested model fell within the RMSEA confidence interval of the comparison model (Little, 1997). A value beyond these specifications suggests that the imposed restrictions are not supported.

Second, structural equation modeling (SEM), a technique that incorporates a predictive model with a CFA, was employed to evaluate the adequacy of the measurement model and the structural model (Fig. 1). In particular, the structural model specified that the quality of mentoring relationship predicted all the outcome variables, in addition to the two mediating variables—quality

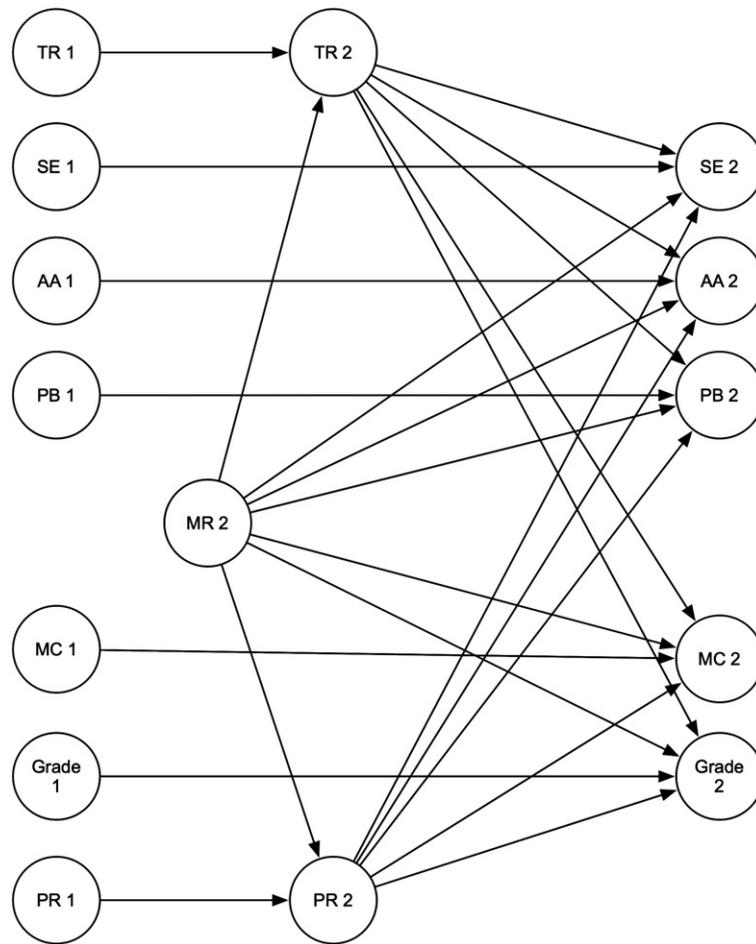


Fig. 1. Hypothesized structural equation model.

of relationship with teacher and parent, respectively—controlling for their baseline levels. In addition, the outcome variables were also predicted by the two mediating variables.

Lastly, to test our hypothesis that the effects of high-quality relationships on positive youth outcomes are mediated through their positive influence on parental relationships and teacher–student relationships, a bootstrap resampling procedure was used (Bollen & Stine, 1990). Bootstrapping is recommended for mediation analysis to account for the asymmetric confidence limits (MacKinnon, Fairchild, & Fritz, 2007). Bootstrapping is preferred over the more traditional Sobel test or causal steps approaches to test indirect effects because it has relatively higher statistical power while maintaining control over the Type I error rate (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; MacKinnon, Lockwood, & Williams, 2004). Bootstrapping, with the available data, generates a reference distribution, which can be used for significance testing and confidence interval estimation (Mooney & Duval, 1993). Following the guidelines by Shrout and Bolger (2002), first, using Mplus 6.0, 1,000 bootstrap samples were created with the existing data by random sampling with replacement. Second, the mediation model of mentor relationship quality (the independent variable) on the five school-related psychological and behavioral outcomes (the dependent variables), through parent and teacher relationship quality (the mediators), was tested 1,000 times with these bootstrap samples. This testing of the bootstrap samples resulted in 1,000 estimates of each path coefficient. Third, output from the 1,000 estimates of each path coefficient provided estimates of the indirect effects. If the 95% confidence interval for these estimates of an indirect effect does not contain 0, it can be concluded that the indirect effect is statistically significant at the .05 level (Shrout & Bolger, 2002).

3. Results

3.1. Missing data and descriptive statistics

Prior to analyzing the data set, we evaluated the pattern of missing data. The overall level of missing data was 3.7%. The missing data patterns appeared to be random (Enders, 2010). The fraction of missing information ranged from 0.002 to 0.012 and the relative efficiency was 0.999 or greater for all variables, indicating that the information lost due to missing data is negligible

(see Allison, 2002; Bodner, 2008; Enders, 2010; Enders & Bandalos, 2001; Graham, Olchowski, & Gilreath, 2007; Schafer & Olsen, 1998). In other words, the recreated covariance matrices from multiple imputations are essentially identical because the between-imputation variance is trivial. Under these circumstances, we utilized a single imputation to optimize power and to assume the less restrictive missing at random (MAR) assumption (see Graham, 2009). The single imputation process, conducted with Amelia II in R (Honaker, King, & Blackwell, 2011), resulted in one complete dataset that was used in the remaining analyses. Correlations between measured variables after imputation are presented in Table 1. All models reported were analyzed with the Mplus 6.0 statistical package (Muthén & Muthén, 1998–2010) using maximum likelihood estimation. All model results are from converged, admissible solutions.

3.2. Measurement model

Nine latent variables were specified in the model: Quality of relationship with mentor (Mentor Relationship; MR), quality relationship with their teachers (Teacher Relationship; TR), quality of relationship with their parents (Parent Relationship; PR),

Table 1
Mean, standard deviation, and zero-order correlation matrix of measured variables ($N = 526$).

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
Baseline													
1. TRQ1	–												
2. TC1	.65*	–											
3. PT1	.39*	.34*	–										
4. PC1	.38*	.36*	.75*	–									
5. SC1	.51*	.57*	.38*	.40*	–								
6. SL1	.41*	.47*	.31*	.35*	.69*	–							
7. ASE1	.39*	.43*	.35*	.38*	.60*	.43*	–						
8. GSW1	.27*	.17*	.42*	.37*	.42*	.33*	.49*	–					
9. SE1	.22*	.24*	.24*	.27*	.41*	.24*	.51*	.49*	–				
10. MC1	–.22*	–.25*	–.31*	–.33*	–.39*	–.33*	–.28*	–.28*	–.17*	–			
11. PB1	.21*	.28*	.18*	.18*	.23*	.26*	.20*	.12*	.12*	.04	–		
12. Grade1	.13*	.12*	.09*	.11*	.20*	.02	.23*	.07	.29*	–.10*	.07	–	
Follow-up													
13. EE2	.10*	.15*	.11*	.11*	.15*	.16*	.11*	.13*	.04	–.16*	.05	–.03	–
14. YC2	.11*	.14*	.10*	.14*	.12*	.13*	.09*	.09*	.09*	–.09*	.13*	–.02	.67*
15. TRQ2	.44*	.35*	.28*	.24*	.27*	.25*	.19*	.16*	.10*	–.22*	.11*	.07	.26*
16. TC2	.28*	.47*	.24*	.23*	.34*	.32*	.24*	.07	.11*	–.27*	.18*	.13*	.26*
17. PT2	.26*	.21*	.52*	.43*	.26*	.26*	.22*	.28*	.15*	–.25*	.10*	.05	.19*
18. PC2	.23*	.24*	.47*	.50*	.28*	.28*	.23*	.22*	.15*	–.28*	.10*	–.01	.19*
19. SC2	.34*	.41*	.27*	.29*	.56*	.49*	.41*	.26*	.26*	–.34*	.24*	.23*	.22*
20. SL2	.25*	.29*	.20*	.23*	.44*	.52*	.31*	.19*	.10*	–.28*	.12*	–.01	.17*
21. ASE2	.25*	.28*	.22*	.19*	.37*	.29*	.44*	.24*	.26*	–.23*	.11*	.20*	.19*
22. GSW2	.20*	.15*	.33*	.28*	.30*	.28*	.28*	.47*	.26*	–.18*	.09*	.14*	.14*
23. SE2	.20*	.21*	.15*	.18*	.33*	.19*	.30*	.25*	.48*	–.15*	.16*	.30*	.04
24. MC2	–.20*	–.28*	–.18*	–.17*	–.36*	–.33*	–.22*	–.09*	–.05	.51*	–.03	–.02	–.19*
25. PB2	.17*	.19*	.14*	.18*	.25*	.22*	.16*	.12*	.20*	–.11*	.42*	.14*	.17*
26. Grade2	.11*	.12*	.07	.10*	.20*	.03	.22*	.07	.30*	–.12*	.07	.78*	–.01
M	16.38	20.52	23.75	27.73	19.43	9.25	13.01	25.54	16.88	3.71	16.34	2.55	28.96
SD	3.30	3.20	4.34	5.24	3.35	2.59	2.72	4.33	3.71	2.73	5.27	1.10	4.12
	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.
14. YC2	–												
15. TRQ2	.17*	–											
16. TC2	.21*	.57*	–										
17. PT2	.20*	.38*	.30*	–									
18. PC2	.20*	.34*	.28*	.77*	–								
19. SC2	.19*	.51*	.58*	.41*	.39*	–							
20. SL2	.11*	.46*	.50*	.31*	.33*	.70*	–						
21. ASE2	.15*	.33*	.32*	.29*	.29*	.55*	.37*	–					
22. GSW2	.13*	.34*	.21*	.44*	.37*	.45*	.33*	.50*	–				
23. SE2	.12*	.23*	.25*	.27*	.24*	.46*	.22*	.51*	.49*	–			
24. MC2	–.11*	–.27*	–.36*	–.24*	–.23*	–.46*	–.37*	–.30*	–.20*	–.23*	–		
25. PB2	.20*	.25*	.29*	.22*	.28*	.34*	.24*	.18*	.18*	.30*	–.06	–	
26. Grade2	–.03	.09*	.13*	.07	.05	.24*	.01	.26*	.15*	.33*	.01	.13*	–
M	17.44	16.25	20.11	23.47	27.42	18.84	8.92	12.86	25.46	16.92	4.36	16.69	2.68
SD	3.02	3.47	3.20	4.60	5.74	3.39	2.48	2.71	4.63	3.60	2.77	4.98	1.14

Note. TRQ = teacher relationship Quality; TC = teacher connectedness; PT = parent trust; PC = parental communication; SC = school connectedness; SL = school liking; ASE = academic self-esteem; GSW = global self-esteem; SE = scholastic efficacy; MC = misconduct; PB = prosocial behavior; Grade = teacher-rated overall academic grade (teacher-rated); EE = emotional engagement; YC = youth centered relationship. For multiple-item scales, the sum of items was used to calculate the correlation. The number following variable names denotes time of collection (i.e., 1 = baseline, 2 = follow-up). * $p < .05$.

Table 2
Correlations between latent variables in measurement model.

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1 TR1	–														
2 PR1	.50*	–													
3 AA1	.70*	.51*	–												
4 SE1	.51*	.54*	.71*	–											
5 MC1	–.29*	–.40*	–.44*	–.35*	–										
6 PB1	.35*	.24*	.36*	.28*	.06	–									
7 Grade1	.10*	.09	.14*	.17*	–.06	.11*	–								
8 MR2	.17*	.17*	.19*	.18*	–.16*	.09	–.04	–							
9 TR2	.54*	.33*	.41*	.22*	–.26*	.19*	.08	.30*	–						
10 PR2	.30*	.60*	.36*	.33*	–.31*	.13*	–.00	.26*	.42*	–					
11 AA2	.47*	.34*	.69*	.43*	–.36*	.27*	.16*	.25*	.72*	.47*	–				
12 SE2	.34*	.39*	.52*	.56*	–.26*	.21*	.21*	.24*	.44*	.52*	.70*	–			
13 MC2	–.24*	–.23*	–.40*	–.20*	.51*	–.03	.05	–.16*	–.27*	–.24*	–.49*	–.34*	–		
14 PB2	.22*	.19*	.34*	.25*	–.08	.54*	.20*	.22*	.34*	.30*	.42*	.37*	–.05	–	
15 Grade2	.08	.06	.14*	.17*	–.09	.11*	.78*	–.03	.10*	.03	.17*	.25*	.07	.18*	–

Note. PR1 = Parent Relationship, TR = Teacher Relationship, AA = Academic Attitudes, SE = Self-Esteem, MC = Misconduct, PB = Prosocial Behavior, Grade = Teacher rated overall academic grade; Number following variable names denotes time of collection (i.e., 1 = baseline, 2 = follow-up). * $p < .05$.

Academic Attitudes (AA), Academic Performance (Grade), Self-Esteem (SE), Misconduct (MC), and Prosocial Behaviors (PB). For each of these constructs, apart from GRADE (a single-indicator factor), three domain-representative parcels were created from the measured items of each scale resulting in three parcels per latent variable (see Little, Cunningham, Shahar, & Widaman, 2002). Additionally, each of the latent variable (excluding MR) was measured on two occasions, resulting in a 17-factor measurement model (see Fig. 1).

All latent variables were freely correlated in the measurement model. To set the scale for model estimation, we used the effects-coding method (Little, Slegers, & Card, 2006). The effects-coding identification method allowed for “scaling that is in a meaningful metric; that is, a given latent variable will be on the same scale as the average of all its manifest indicators” (Little et al., 2006, p. 67). This scale-setting method allowed for the estimation of latent variance across groups that were comparable and not arbitrarily set. This method was also utilized to set the scale for intercepts in order to assess the latent means in a comparable non-arbitrary metric. The results indicated this model was a good fit to the data, $\chi^2(822, N = 526) = 1651.406, p < .001, CFI = .94$, and RMSEA = .044 (90% CI: .041, .047). The zero-order correlations between all latent variables are reported in Table 2.

3.3. Measurement invariance

As shown in Table 3, strong factorial invariance was supported across both genders and grade levels (i.e., elementary versus middle/high school).

3.4. Structural model

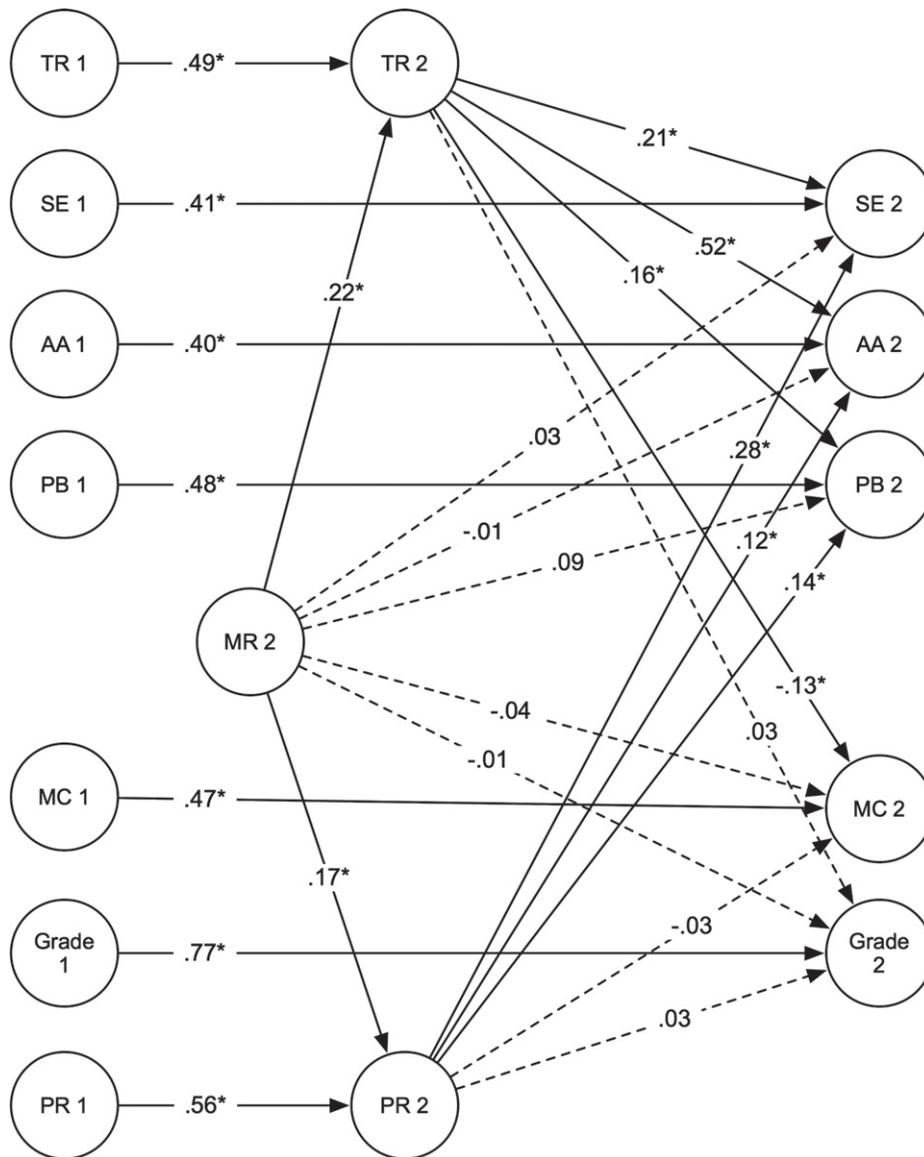
The hypothesized structural equation model (Fig. 1) was tested. The results indicated this model was a good fit to the data, $\chi^2(864, N = 526) = 1773.73, p < .001, CFI = .93$, and RMSEA = .045 (90% CI: .042, .048). Standardized path coefficient values are presented in Fig. 2. As hypothesized, mentoring relationship quality was found to have positive effects on parent relationship

Table 3
Fit indices for the nested sequence in the multiple group (gender and grade) confirmatory factor analysis.

Model	χ^2	df	p	RMSEA	RMSEA 90% CI	CFI	Δ CFI	TLI	Δ TLI	Pass?
<i>Gender</i>										
Null	40102.65	2101	<.001	–	–	–	–	–	–	–
Configural invariance	1953.3	1644	<.001	.045	.041–.048	.992	–	.990	–	Yes
Loading invariance ^a	1993.12	1688	<.001	.045	.042–.048	.992	.000	.990	.000	Yes
Intercept invariance ^a	2124.52	1732	<.001	.047	.043–.050	.990	.002	.987	.003	Yes
<i>Grade</i>										
Null	62522.59	2101	<.001	–	–	–	–	–	–	–
Configural invariance	2020.64	1644	<.001	.049	.045–.052	.994	–	.992	–	Yes
Loading invariance ^a	2072.89	1688	<.001	.048	.045–.051	.994	.000	.992	.000	Yes
Intercept invariance ^a	2156.19	1732	<.001	.048	.045–.051	.993	.001	.991	.001	Yes

Note. RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker–Lewis index. Pass = yes when the change in CFI was $\leq .01$ and RMSEA value of the nested model fell within the RMSEA confidence interval of the comparison model. Each nested model contains its constraints, plus the constraints of all previous, tenable models.

^a Evaluated with the RMSEA and CFI model test.



Note. PR = Parent Relationship, TR = Teacher Relationship, AA = Academic Attitudes, SE = Self-Esteem, MC = Misconduct, PB = Prosocial Behavior, Grade = Teacher rated overall academic grade; Number following variable names denotes time of collection (i.e., 1 = baseline, 2 = follow-up). * $p < .05$.

Fig. 2. Standardized parameter estimates of the final structural equation model. Note. PR=Parent Relationship, TR=Teacher Relationship, AA=Academic Attitudes, SE=Self-Esteem, MC=Misconduct, PB=Prosocial Behavior, Grade=Teacher rated overall academic grade; Number following variable names denotes time of collection (i.e., 1 = baseline, 2 = follow-up). * $p < .05$.

quality and teacher relationship quality, controlling for their baseline levels. Teacher relationship quality, in turn, was shown to have significant effects on self-esteem, academic attitudes, prosocial behavior and misconduct, after controlling for their baseline levels. In addition, parent relationship quality had significantly effects on self-esteem, academic attitudes, and prosocial behavior, accounting for baseline levels. None of the predictor variables (i.e., mentoring relationship quality, teacher relationship quality, and parent relationship quality) significantly affected the teacher-rated students' grades.

3.5. Mediation analysis

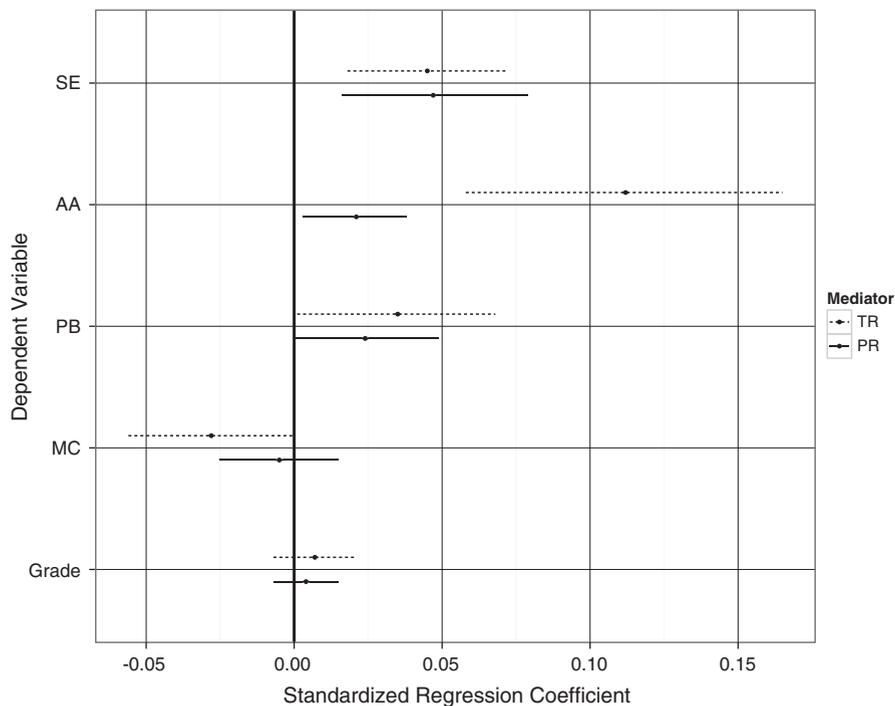
Bootstrap resampling procedure was used to test the hypothesis that the effects of high-quality relationships on positive youth outcomes were mediated through their positive influence on parental relationships and teacher–student relationships. The

results indicated that both teacher and parent relationship quality mediated the effects that mentor relationship quality had on self-esteem and academic attitudes. In addition, teacher relationship, but not parent relationship, quality mediated the effects that mentor relationship quality had on prosocial behavior. Parent and teacher relationship quality did not mediate the effect mentor relationship had on misconduct or academic achievement. The confidence intervals for each mediator–outcome pair are presented in Fig. 3.

4. Discussion

In this study, we drew from a large, random-assignment evaluation of Big Brother Big Sister school-based mentoring (SBM) programs, which found that mentoring had modest effects on a range of academic outcomes (Herrera et al., 2007, 2011). We conducted a secondary analysis of the data to explore the underlying processes through which the quality of the mentoring relationship was associated with improvements in a range of outcomes (e.g., academic attitudes, self-esteem, misconduct, grades, and prosocial behavior). We found that higher quality mentoring relationships were associated with improvements in students' relationships with their parents and teachers and that these improvements, in turn, were associated with school-related psychological and behavioral outcomes (e.g., improved academic attitudes and self-esteem, increased prosocial behavior). The mediational relationship observed was shared across both genders and elementary and middle/high school students. In sections that follow, we discuss each of these pathways and their implications for future research and practice in schools.

First, consistent with previous research and our hypothesis, we found that higher quality mentoring relationships significantly affected parent–child relationships. Whether these improvements occurred through changes in the attachment processes remains undetermined; it is unknown whether the bonds that arose within the mentor relationships actually led to changes in the adolescents' working models of relationships or simply improved parental relationships through, for example, a reduction in everyday tensions. Whatever the underlying processes, it appears that guidance and support from a caring volunteer mentor is associated with improvements in the quality of the parent–child relationship. Although past research on parent socialization has focused largely on the characteristics of the parent or child that increase or decrease the quality of the parent–child relationship



Note. PR = Parent Relationship, TR = Teacher Relationship, AA = Academic Attitudes, SE = Self-Esteem, MC = Misconduct, PB = Prosocial Behavior, Grade = Teacher rated overall academic grade; dot denotes the standardized regression estimate; the line represents the 95% confidence interval.

Fig. 3. Standardized regression coefficients with 95% confidence interval with mentor relationship predicting outcome variables mediated by parent relationship and teacher relationship. *Note.* PR = Parent Relationship, TR = Teacher Relationship, AA = Academic Attitudes, SE = Self-Esteem, MC = Misconduct, PB = Prosocial Behavior, Grade = Teacher rated overall academic grade; dot denotes the standardized regression estimate; the line represents the 95% confidence interval.

(e.g., Bretherton & Munholland, 1999; Shanahan, McHale, Osgood, & Crouter, 2007), this study underscores the importance of examining factors outside this dyad that also may be influential.

Second, the findings extend previous research on CBM programs to include the role of teacher relationships in the context of SBM. The improvements in youth–teacher relationships are encouraging, as they suggest that the influence of mentors could extend beyond their somewhat transient presence in the school setting. Particularly, if such effects endure and carry into other teacher relationships, close mentoring relationships may be more consequential than previous evaluations, based on post-tests generally conducted at the end of the school year, have implied (Wheeler et al., 2010). The associations between improved relationships with teachers and improved youth outcomes are consistent with research on the social nature of learning, which has shown that close relationships with teachers predict student motivation, academic competence and achievement, school engagement, school value, and behavioral adjustment (Allen et al., 2012; Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Decker, Dona, & Christenson, 2007; Eccles & Roeser, 2011; Howes, Hamilton, & Philipsen, 1998; O'Connor, 2010; Pianta, Stuhlman, & Hamre, 2002; Reddy, Rhodes, & Mulhall, 2003; Ryan & Grolnick, 1986).

It is also important to consider these results within the broader context of the original BBBS evaluation. As noted earlier, although the evaluation reported modest, positive program effects on a range of outcome measures, most of these effects disappeared when youth were reassessed during the fall of the following school year (Herrera et al., 2007). Based on findings from the evaluation that suggested that stronger relationships were associated with more favorable youth outcomes, BBBS recommended that its agencies adopt a range of strategies aimed at improving the mentoring relationship in SBM (e.g., improved training and support to matches; Hansen, Romens, & LaFleur, 2011). The current results highlight the importance of these enhancements and suggest that closer relationships can improve the retention of effects through their positive influence on youth's orientation to other important adults in their lives.

4.1. Limitations and strengths

Although this study sheds light on the processes through which SBM relationships benefit children, it is not without limitations. For example, although we controlled for most baseline measures, the mediation model is correlational in nature. In particular, because mentoring relationship quality could not be measured at baseline, relationship quality and outcome measures were assessed at the same time point. As such, we were unable to explore if mentoring relationship quality actually led to changes in outcome measures. Future studies should include additional waves of follow-up data.

In addition, there were limitations related to the measures included in the study. With the exception of academic achievement, which was reported by teachers, all of the outcome measures relied on self-report data. On the other hand, the teacher-reported measure of academic achievement was a single-item variable, and teacher ratings of academic abilities and achievement may be subject to bias (e.g., Harlen, 2005; Hughes, Gleason, & Zhang, 2005). In future studies, it will be important to supplement child and teacher reports with data from parents, as well as more objective indicators of academic skills and behavioral outcomes (DuBois, Holloway, Valentine, & Cooper, 2002). Finally, studies that include qualitative research components are also needed to explore the factors mediating the associations between match quality and youth outcomes.

Additionally, although over 80% of the participants were between the ages of 9 and 12, the model included a relatively wide age range. Youth's proclivity toward forming connections with nonparent adults may vary as a function of developmental status. In particular, relative to older adolescents, younger adolescents have reported better friendships and more disclosure with adults than older adolescents (Thomson & Zand, 2010) and tend to have more enduring ties with mentors (Grossman & Rhodes, 2002). These developmental differences, in turn, may affect the mentoring processes. Future research should examine the extent to which results are shaped by factors such as the developmental status, race/ethnicity, socioeconomic status, and the gender of mentees, mentors, and teachers.

It is also important to note that this study examined associations between mentoring quality and outcomes, not mentoring *per se*. As such, although baseline functioning was accounted for in the model, it remains possible that higher quality mentoring relationships were forged with youth who had pre-existing psychosocial assets, including better social skills. If mentoring relationship quality is simply a proxy for better underlying adjustment, then the observed improvements in youth outcomes may reflect unmeasured factors. Future research should include instrumental variable techniques to control for this potential bias (Gennetian, Morris, Bos, & Bloom, 2005). In a similar vein, mentor and student characteristics likely influence mentoring relationship quality, and such variables could be controlled in future studies. For example, in the current study, we found significant correlations between mentoring quality and many of the baseline assessments, including parent and teacher relationships, academic attitudes, self-esteem, and misconduct. A more systematic analysis of how both mentor and youth characteristics influence mentoring relationship quality, in turn promoting positive outcomes, would have important implications for screening volunteers and identifying youth that may be more or less likely to benefit from mentoring. The mentoring relationships were all situated within the context of BBBS programs, where the degree of structure and the criteria for youth eligibility might limit the generalizability of the findings. Lastly, it is worth noting that the number of analyses performed increased the risk of Type I error.

Despite these limitations, the current study represents a step toward understanding the processes through which high-quality mentoring relationships can benefit youth. Mentoring programs may foster improvements in youths' relationships with parents and teachers, perhaps indicating a shift in how youth perceive and interact in these relationships. To the extent that such pathways are understood, programs can be refined to maximize youth benefits.

4.2. Implications for research

Future research could explore the processes underlying changes in teacher–child and parent–child relationships. Because interactions with teachers often share similar patterns to those observed in parent–child relationships (Hamilton & Howes, 1992; Pianta & Steinberg, 1992), changes in both important relationships may signal a more general updating of the mentee's working model of attachment. On the other hand, the improvements could be explained by more immediate changes, such as increased compliance and improved attitudes among children at school, or reduction in everyday tensions between parents and children.

In either case, these findings underscore the potentially far-reaching effects of close mentor–youth bonds and the necessity of additional research on the nature of their effects. For example, future research should explore variables assessing children's attachment styles, emotion regulation, and social skills. Studies that investigate whether mentoring relationship quality affects youth–adult relationships in other settings, such as in after-school programs, summer camps, and churches, as well as relationships with other family members, would also be valuable contributions to the literature.

4.3. Implications for practice

Along with the implications for research, the results provide insight into how mentoring programs and schools may be able to more effectively promote youth outcomes. First, consistent with previous research (e.g. Parra et al., 2002), the findings highlight the key role that the quality of the mentor–youth relationship plays in the benefits youth derive from mentoring. These findings suggest the importance of providing volunteers with training around relationship building. In fact, the effectiveness of mentor training appears to be manifested through its documented impact on mentors' feelings of closeness, support, satisfaction and effectiveness (DuBois, Holloway, et al., 2002; Herrera et al., 2000). These perceptions positively influence both outcomes and duration, suggesting the lasting importance of mentor training and mentor's self-perceptions of efficacy for youth outcomes (DuBois & Neville, 1997; Parra et al., 2002). Regrettably, however, there are few evidence-based training programs for volunteer mentors (Kupersmidt & Rhodes, in press). This gap might explain the growing difficulties with volunteer retention, a particularly troubling trend given the adverse effects associated with breakdowns of relationships (Grossman & Rhodes, 2002; Grossman et al., 2012). Mentors who are able to persist beyond the initial stages of relationships are likely to foster greater gains in youth. As mentoring programs expand, it will be essential that adequate resources are available to ensure reasonable levels of screening, training, and post-match mentor support to help develop the kinds of relationships that can yield positive benefits for youth.

Second, the mediating role of improved parent and teacher relationships is worthy of attention in mentoring practice. In training mentors, programs could explicitly articulate the role that improved parent and teacher relationships may play in contributing to a broad range of youth outcomes and provide mentors with training designed to foster such improvement in their mentees (e.g., emotion and behavior regulation, effective communication, and conflict resolution). Additionally, it is recommended that program staff establish collaborative relationships with parents and teachers, providing them with information about the mentoring program and exchanging information about youth's progress. If parents and teachers feel involved in and supported by, as opposed to supplanted by, the mentoring relationship, they may be more likely to reinforce the mentor's positive influences. Attention to the relationships youth have with their parents and teachers might also be helpful in determining which youth are likely to derive benefits from mentoring. Baseline assessments of relationship functioning would help programs identify youth who may lack close relationships with parents and teachers and with whom mentors might explicitly address issues related to parent and teacher relationships (see Schwartz et al., 2011).

Finally, this study suggests the potential impact of bringing additional caring adults into school settings and has implications not only for mentoring relationships but also for classroom aids, adult volunteers in schools, and support staff, including guidance counselors, social workers, and school psychologists. Although future research is needed, this study suggests that by increasing the number of adults in schools with whom students can build close relationships, schools could foster a wide range of positive youth outcomes, including improved teacher–student relationships, academic attitudes, and self-esteem.

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