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How Mentor Support Interacts With Mother and Teacher Support in Predicting Youth Academic Adjustment: An Investigation Among Youth Exposed to Big Brothers Big Sisters of Canada Programs

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Abstract This study examines three potential contributions (i.e., additive only, hierarchical compensatory, and hierarchical conditional) of mentor support to youth academic adjustment, taking into account interactions with support from mothers and teachers. We derived data from a larger study of the Big Brothers Big Sisters (BBBS) of Canada community mentoring program. The sample included 427 youth (average age 9.8 years; 64% girls, 56% White) who received one-to-one community-based mentoring for at least three months. We assessed perceptions of support from mothers and teachers before the match and assessed perceptions of support from mentors five times throughout the mentoring experience. Hierarchical linear regression analyses showed that mentor support predicted positive changes in youth academic adjustment (i.e., school attitude, academic self-efficacy, assistance seeking, and problem solving) mainly when mentees already reported high support from their mother. This finding clearly supports the conditional model and invites researchers to question the assumption that mentoring constitutes a corrective experience for young people (i.e., the compensatory model). BBBS agencies are strongly encouraged to involve parents in the mentoring process and to view them as experts, assets, and allies in their effort to meet the youth's needs.

Keywords Mentee support · Youth mentoring · Academic adjustment · Big Brothers Big Sisters · Canada

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Introduction

The research on educational and developmental psychology has produced compelling evidence that the quality of the support that youth receive from their parents and teachers throughout their school years largely influences the quality of their academic adjustment (Fall & Roberts, 2012; Hattie, 2009; Jimerson, Egeland, Sroufe, & Carlson, 2000; Vitaro, Brendgen, Larose, & Tremblay, 2005; Wenzel & Wigfield, 2009). Unfortunately, some youth grow up in difficult socioeconomic circumstances, with generally limited access to support from these significant adults. In order to buffer the negative effects of such environments, many communities and schools provide children with adult mentors, usually under a Big Brothers Big Sisters (BBBS) or other affiliated program. Although studies have reported many academic benefits in the very short term for youth who participate in BBBS programs [e.g., see the meta-analyses by DuBois, Portillo, Rhodes, Silverthorn, and Valentine (2011) and by Eby, Allen, Evans, Ng, and DuBois (2008)], no studies to our knowledge have attempted to determine how the support received from a BBBS mentor interacts with natural support provided by parents and teachers in predicting youth academic adjustment. We conducted the present longitudinal study to address this question. Using a systematic examination of interactive patterns among mentor, parent, and teacher support, we attempted to identify the unique and specific contribution of BBBS support to predict changes in youth academic adjustment.

Parental and Teacher Support and Youth Academic Adjustment

A number of theoretical perspectives, including attachment theory (Bowlby, 1969) and self-determination theory (SDT; Deci & Ryan, 1985), suggest that support from parents, in its different forms (e.g., sensitive parenting, parental involvement, autonomy support, emotional and instrumental support), is one of the most influential determinants of youth academic adjustment. The theory explains this positive effect by the activation in the child of various processes, including positive working models of self and others, the ability to explore the school environment and forge positive ties with peers and teachers, and the satisfaction of the basic psychological needs that are essential for academic motivation (i.e., relatedness, autonomy, and competence). This idea of a strong association between academic adjustment and parental support is not new. In addition, numerous cross-sectional and longitudinal studies of children and adolescents offer further support. For example, youth whose parents provided them with emotional and academic support (Cutrona, Cole, Colangelo, Assouline, & Russell, 1994; Rueger, Malecki, & Demaray, 2010; Song, Bong, Lee, & Kim, 2015), maintained high expectations of success (Gordon & Cui, 2012), used a democratic, nondirective parenting style (Ishak, Low, & Lau, 2012), and were involved in their child's academic achievement (Wilder, 2014), showed better academic functioning in elementary and high school. Support from parents also played a significant role in reducing

declines in youth school engagement during their high school transition (Wang & Eccles, 2012) and in predicting high school graduation (Wilder, 2014).

In addition to parental support during the school years, researchers overwhelmingly agree that teacher support plays a critical role in the development of school motivation and attachment (Wenzel & Wigfield, 2009). For example, theoretical perspectives on social support propose that a teacher's emotional support acts as a buffer against stress and performance anxiety (Lempers & Clark-Lempers, 1992; Sarason, Pierce, & Sarason, 1990), which would help youth cope with academic demands. Indeed, studies on this topic have shown that perceptions of teacher support have predicted youth academic adjustment (e.g., perceived academic competence, interest in academics, compliance with classroom norms) above and beyond perceptions of support from parents and family (Jiang, Huebner, & Siddall, 2013; Sterrett, Jones, McKee, & Kincaid, 2011; Wenzel & Wigfield, 2009). Moreover, some studies have indicated that the association between teacher support and academic adjustment is stronger when students come from a non-supportive family environment (Hughes, Cavell, & Jackson, 1999), suggesting that teacher support can sometimes compensate for lack of parental support.

Formal Mentoring Support and Youth Academic Adjustment

Studies have provided increasing support for the idea that formal mentoring generates positive short-term benefits for youth academic adjustment. Experimental and quasi-experimental studies have found positive effects of formal mentoring on adolescent attitudes toward school (Karcher, 2005), sense of belonging at school (Randolph & Johnson, 2008), feelings of academic competence (Morrow-Howell, Jonson-Reid, McCrary, Lee, & Spitznagel, 2009), perceptions of relationships with teachers (Larose et al., 2012), classroom attendance (Rhodes, Grossman, & Resch, 2000), and academic perseverance (Tyler & Lofstrom, 2009). Theoretically, improvements in the cognitive and social skills of youth who spend time with mentors who are empathetic, sensitive, and supportive would explain these effects (Rhodes, 2005). However, the current literature is inconclusive as to the specific role of mentor support in youth academic adjustment when multiple support sources are at play. In line with the systemic model of the youth mentoring intervention (Keller, 2005; Keller & Blakeslee, 2013) and theoretical perspectives on relationship specialization and substitution in social networks (Cantor, 1979; Rook & Schuster, 1996), the contribution of mentor support within a youth's social network may operate according to three distinct theoretical frameworks.

First, mentor support could provide an *additive* contribution. In the additive model, mentor support makes a unique contribution to youth academic adjustment that the support from teachers and parents cannot explain. Thus, youth who benefit from three support sources (parents, teachers, and mentors) would be better adjusted than youth who perceived support only from parents and teachers. Second, support from a mentor could make a *hierarchical compensatory* contribution. In this model, parental and/or teacher support would interact with mentor support in predicting academic adjustment. The effect of mentor support would operate only when parental or teacher support is lacking. In other words, mentor support would

compensate for the lack of parental or teacher support. This model incorporates the "corrective function" of mentoring proposed by Rhodes (2005). In opposition to the compensatory model, the third model, the *hierarchical conditional* model, suggests that mentor support would also interact with parental and/or teacher support, but in a different way: the positive effect of mentor support would operate only if parental and teacher support are of sufficient quality. This is "the rich get richer" hypothesis, which implies that youth who already have supportive network relationships would benefit more from mentoring than those who lack this support (Barrera & Bonds, 2005).

Findings in the social support research provide support for some of these models. For example, correlational studies show that youth who reported higher support from both parents and other adults in their social network experienced better personal adjustment (i.e., less loneliness, fewer internalizing behaviors, and higher self-concept) than youth with perceptions of parental support only, suggesting that mentoring makes an additive contribution (Levitt et al., 2005; Rosenfeld, Richman, & Bowen, 2000). In addition, a longitudinal study showed that the positive association between parental support and youth academic adjustment decreased significantly during adolescence, whereas the association between support from other adults and academic adjustment increased (Rueger et al., 2010). Rueger et al. (2010) hypothesized that the presence of other adults in a youth's social network would provide emotional and instrumental support at times when the parents were unavailable or when family conflicts compromised the quality of their support. This hypothesis is consistent with a hierarchical compensatory mentoring contribution.

Some mentoring studies have explored the specific contribution of mentor support in relation to other support sources. In youth with disabilities, having a natural mentor who provided inspiration for an academic or career path was predictive of youth life satisfaction above and beyond perceived support from parents and peers (Pham & Murray, 2016). This finding is consistent with an additive contribution model. In late adolescence, the predictive associations between perceptions of mentoring support and two indicators of college adjustment (i.e., attachment to the institution and academic adjustment) were stronger for youth with more secure maternal relationships (Soucy & Larose, 2000). This finding is consistent with the hierarchical conditional model. Another study found that youth who perceived relationships with parents, peers, and teachers as satisfactory but not particularly strong benefited more from mentoring in terms of academic adjustment than did youth with profiles of either strongly positive or negative supportive relationships with these individuals (Schwartz, Rhodes, Chan, & Herrera, 2011). Although natural support was confounded (i.e., based on multiple sources) in Schwartz et al.'s (2011) study, their results are compatible with the hypothesized hierarchical compensatory contribution of a BBBS mentor. They also suggest that the compensatory effect would operate only beyond a certain relational vulnerability threshold.

In sum, the literature provides rather weak and sometimes contradictory evidence that does not clarify the specific contribution of BBBS support to youth academic adjustment. Knowing that mentors do not operate in a vacuum and that they influence and are influenced by other relationships in the mentee's social network

(Keller, 2005; Keller & Blakeslee, 2013), we should consider natural support sources when assessing the effects of support from a formal mentor. The objective of our study was to investigate the potential contributions of BBBS support to youth academic adjustment while taking into account support from parents and teachers by testing additive, hierarchical compensatory, and hierarchical conditional models. We assessed academic adjustment in terms of youth school attitude, academic self-efficacy, assistance seeking, and problem solving. We retained these outcomes for their close associations with school success and perseverance (Jimerson et al. 2000; Larose & Tarabulsy, 2014; Vitaro et al., 2005).

Method

The Big Brothers Big Sisters of Canada Longitudinal Study

We drew the data for this article from the Canadian longitudinal study of program-supported mentoring relationships (i.e., BBBS mentoring; De Wit, DuBois, Erdem, Larose, & Lipman, 2016). The participants in that study comprised 997 families (parent–youth dyads) recruited by 20 BBBS agencies located in major urban settings (e.g., Toronto, Vancouver, and Montreal). All the participating families agreed to respond to questionnaires at the time of admission to the BBBS agency (baseline) and at 6, 12, 18, 24, and 30 months after admission, regardless of whether or not the youth had been matched with a mentor during that period. A trained interviewer administered all the questionnaires at the family home after obtaining parental consent. The Research Ethics Board of the Centre for Addiction and Mental Health (CAMH) approved all the study procedures. We drew the data for our study primarily from selected questionnaires that the youth completed at all measurement times. These questionnaires assessed youth's perceptions of the support they received from their mentor, parents, and teachers as well as their academic adjustment before and during the mentoring relationship.

Participants

For this study, we used a subsample of the original 997 participants, comprising youth who (1) were matched with a mentor within 6 months post-baseline; and (2) had participated in a mentoring relationship for at least 3 months (regardless of the number of successive mentors to whom they were matched). We retained the 3-month duration as an inclusion criterion to ensure that the mentoring relationship had endured beyond the initial contemplation phase (Keller, 2005). Because the contemplation phase focuses primarily on information exchanges, activity planning, and clarification of expectations, we felt it would be inappropriate to assess perceptions of support from the mentor this early in the relationship.

Study data included 427 youth (mean age = 9.8, SD = 2.2; 64% girls). At the end of the study, youth had participated in a mentoring relationship for an average of 20.18 months (SD = 8.56). Of the subsample, 71% were matched with a single mentor throughout this period and 29% were rematched. Based on parent reports,

the majority of the subsample participants were White (56%), with about one-third (30%) belonging to a minority ethnic group (i.e., Native-, African-, Asian-, Hispanic-, or Arab-Canadian) and 14% belonging to other ethnic groups. The majority of the youth lived in a single-parent household with their biological mothers (60%) or fathers (7%). The majority of the families had low-income status (56% had an annual household income of less than $30,000), and of these, 32% were receiving social assistance.

Procedure and Measures

We used four scales to assess academic adjustment, three scales to assess social support, and two indicators to quantify the mentoring experience. We also used certain responses by youth and parents at baseline to describe the sample (i.e., youth's and mentors' sex and age, ethnic group, family income, and family status) and to control for certain potential external effects. We measured youth academic adjustment at six time points: admission to the agency (baseline) and 6, 12, 18, 24 and 30 months later (i.e., during and after the mentoring experience). The baseline adjustment score provided a control variable for the regression analysis (see Analysis section). We used a mean adjustment score calculated from the five scores obtained after baseline as a predicted variable. We assessed perceptions of mentor support at five potential times (i.e., 6, 12, 18, 24 and 30 months after admission). We calculated a mean mentor support score for use as a predictor variable in the regression analysis. For the predictor variables parent support and teacher support, we used the admission score rather than the scores during mentoring in order to prevent underestimating perceptions of support during mentoring. In effect, a combined assessment of the three support types after baseline could result in lower mentor support scores due to potential bidirectional effects between the mentoring and perceived support from parents and teachers. In addition, considering that very few youth reported living with their father (7%), we opted to use youth perceptions of support from the mother only.

Predicted Variables: Academic Adjustment Outcomes

School Attitude

We designed a 5-item scale specifically for our study (e.g., "It is important to do well at school"; "School is fun"). Participants responded on a 5-point Likert scale ranging from 1 (Strongly agree) to 5 (Strongly disagree). Answers were then recoded and summed. High scores on the scale indicated a positive attitude toward school. Cronbach's alphas across the six measurement times varied from 0.78 to 0.84.

Academic Self-Efficacy

We used the Academic Self-Efficacy Scale of the Patterns of Adaptive Learning Scales (PALS, Midgley et al., 2000) to measure academic self-efficacy. It contains

four items (e.g., "Even if the work is hard, I can learn it") rated on a 6-point Likert scale (0 = Not at all true of me; 5 = Very true of me). Cronbach's alphas across the six measurement times varied from 0.77 to 0.89.

Coping Skills

We measured coping skills with the Coping Scale for Children and Youth (CSCY; Brodzinsky, Elias, Steiger, Simon, Gill, & Hitt, 1992). Youth indicated the extent to which they used certain behavioral strategies to cope with problems in their life in general (with their family, with a friend, at school, or anywhere else). The scale contains 12 items rated on a 4-point Likert scale (0 = Never; 3 = Very often). It assesses two dimensions: Assistance seeking (4 items, e.g., "I ask someone in my family for help with the problem") and Problem solving (8 items, e.g., "I think about the problem and try to figure out what I can do about it"). Cronbach's alphas across the six measurement times varied from 0.52 to 0.68 for assistance seeking and from 0.85 to 0.92 for problem solving.

Predictor Variables: Support from Adults

Teacher Support

We assessed teacher support with the Teacher support dimension of the Survey of Children's Social Support (Dubow & Ullman, 1989). This scale contains five items (e.g., "Do you think your teachers care about you?") rated on a 5-point Likert scale (0 = Never; 4 = Always). It assesses students' overall perceptions of teacher support. Cronbach's alpha at admission was 0.80.

Mother Support

We used the Emotional support subscale from the Parent support scale (Wills, Vaccaro, & McNamara, 1992) to assess mother support. The subscale contains 7 items (e.g., "When I feel bad about something, my mother will listen") to which youth responded on a 4-point Likert scale (0 = Not at all; 3 = Very much). Cronbach's alpha for this subscale at admission was 0.89.

Mentor Support

We used the Quality of Mentoring Relationship Engagement Scale (Ferro, Wells, Speechley, Lipman, & DeWit, 2014) to assess mentor support under the BBBS program. It contains 22 items (e.g., "My Big Brother/Sister is there for me when I have a problem") rated on a 3-point Likert scale (1 = Very true; 3 = Not very true). Answers were then recoded and summed. High scores on the scale indicated high mentor support. Again, we used the mean scores obtained during the mentoring experience (i.e., at the 6-, 12-, 18-, 24- and 30-month follow-ups) to quantify mentor support. Cronbach's alphas across the five measurement times varied from 0.85 to 0.90.

Control Variables

Mentoring Duration and Rematch

In order to account for dosage differences in the mentoring program, we considered two indicators in the regression model as control variables: mentoring duration and whether or not the student had been rematched. We measured mentoring duration and rematch by asking the students at each measurement time if they were still in a BBBS mentoring relationship. If yes, they indicated how long they had been mentored. We then calculated the total mentoring time at the fifth follow-up. If a student had been matched with more than one mentor, we considered the total duration of all the mentorships and placed the student in the rematch group.

Mentor and Mentee Characteristics

We also considered the potential confounding effect of certain characteristics of the mentor and mentee on the predictive associations between perceptions of support and academic outcomes. We included the mentee's sex and age, ethnic group (i.e., Native-, African-, Asian-, Hispanic-, or Arab-Canadian), and family income as reported by the mother (i.e., 1 = under $5000; 2 = $5000–$9999; […] 8 = $60,000 or more) as potential control variables. We also considered mentor's sex and age.

Missing Data

Attrition is a common problem in longitudinal research (Graham, 2009; Ployhart & Vandenberg, 2010). In our study, some youth did not participate at all measurement times or did not respond to all items on a given questionnaire. The quantity of missing data varied from 0 to 23.2% across variables (for an average of 2.6% per variable). Little's (1988) MCAR test showed that the data were not missing completely at random [$\chi^2(666) = 865.71$, $p < .001$]. To account for this problem, we opted for multiple imputation to account for missing data (Rubin, 1987) in MPlus 7.3 using maximum likelihood estimation. This procedure enables handling missing data by applying plausible values and proposing several solutions. We decided to create 20 imputed data files. We then ran separate analyses on each computed file, then combined the results and adjusted for the additional uncertainty due to imputation (Rubin & Little, 2002).

Analysis

We initially examined the data to ensure that they met basic statistical assumptions, notably normal data distribution and data independence. The skewness and kurtosis scores for the variables revealed some univariate outliers. To reduce their influence on the data, we reduced these scores to within three standard deviations above or below the mean (Tabachnick & Fidell, 2007). In addition, we performed analyses to ensure that the data met the independence assumption. Because the youth were recruited from 20 BBBS agencies, with about 20 youth per agency, the data may not

have been completely independent. To estimate the dependency effect, we calculated the design effect (DEFF; McCoach & Adelson, 2010; Muthén & Muthén, 2000) using the following equation: $DEFF = 1 + p(\bar{n} - 1)$, where p is the intraclass correlation (ICC) and $\bar{n}$ is the average cluster size, a measure of the average number of children per agency. The calculated ICCs for all variables were weak, ranging from 0.001 to 0.052, indicating that the data on youth from a given agency were independent. The subsequently calculated DEFFs ranged from 1.00 to 1.92. Generally, a DEFF ranging from 1.00 to 2.00 is considered acceptable and sufficiently low that it can be ignored, so that the data may be considered independent (McCoach & Adelson, 2010; Muthén & Muthén, 2000).

We performed preliminary analyses with SAS 9.4 and main analyses with MPlus 7.3 using missing data imputation. We also ran hierarchical linear regression analyses predicting academic outcomes from teacher, mother, and mentor support to address the study's hypotheses. We then standardized all variables included in the regression analyses. First, we performed two sets of linear regression analyses, the first of which included the eight control variables (i.e., mentoring duration in months, rematching or not, mentor sex, mentee sex, mentor age, mentee age, ethnic group, and income category); and the second of which excluded them. A comparison of the results of the two regression analyses revealed no changes in the predictive effects of the social support variables. For purposes of parsimony, we therefore chose to report the regression models without control variables.

Accordingly, we tested the following regression model: for each outcome, we entered the baseline score for the same predicted variable first (step 1), followed by maternal and teacher support (step 2). We then entered mentor support in step 3 to determine the additive contribution of mentoring. In step 4, we tested all double interaction effects (mentor x teacher, mentor x mother, and teacher x mother) to determine conditional and compensatory effects. In step 5, we tested the triple interactions (e.g., mentor x mother x teacher). Next, we decomposed the statistically significant interaction effects to determine their directions. We then tested the scores used in the equation at one and two standard deviations above and below the mean (Cohen, Cohen, West, & Aiken, 2003) and illustrated the decompositions. Finally, we measured the simple slopes for each curve to determine whether they differed from zero (Aiken, West, & Reno, 1991).

Results

Descriptive Statistics of Predictor and Predicted Variables and Correlations Among Study Variables

Table 1 presents the descriptive statistics of the predictor and predicted variables. Although youth reported relatively high support, an examination of the standardized mean differences (SMDs) between support sources showed slightly lower perceptions of support in relationships with mentors as compared to mothers, $t(425) = 2.56$, $p < .01$, and teachers, $t(425) = 2.42$, $p < .01$. Furthermore, the ranges indicate much more homogenous support in relationships with mentors than

Table 1 Descriptive statistics for each predictor and predicted variable

	M	SD	Scale range[a]	Observed range
Teacher support (B)	3.10	0.77	0.00–4.00	0.57–4.00
Mother support (B)	2.33	0.50	0.00–3.00	0.67–3.00
Mentor support (F1–F5)	2.44	0.20	1.00–3.00	2.04–3.00
School positive attitude (F1–F5)	3.98	0.62	1.00–5.00	1.92–5.00
Academic self-efficacy (F1–F5)	3.14	0.57	0.00–5.00	1.25–4.00
Assistance seeking[b] (F1–F5)	1.72	0.52	0.00–300	0.19–3.00
Problem solving[b] (F1–F5)	1.65	0.54	0.00–3.00	0.06–3.00

B, Baseline assessment at admission; F1, 1st follow-up 6 months after admission; F5, 5th follow-up 30 months after admission

[a]Higher values represent a more positive response (always, very true, very much, very often, strongly agree)

[b]From the coping skills measure

with mothers or teachers. Table 1 also shows high average academic adjustment scores, although they are relatively dispersed. An examination of the SMDs between academic adjustment scores showed no significant differences, suggesting comparable adjustment across indicators.

Table 2 presents the correlations among the main study variables, including control variables. Results reveal positive associations between mentor support and all academic adjustment outcomes except for academic self-efficacy at baseline. As expected, these associations were stronger when the outcome was measured during the mentoring relationship (F1–F5) compared to baseline (B). In addition, we observed positive associations between mentor support and both maternal and teacher support, with stronger associations for maternal support. Furthermore, the correlations over time (i.e., from baseline to follow-ups) for a same academic adjustment outcome were moderately high, with the strongest correlation for school attitude ($r = 0.58$) and the weakest for assistance seeking ($r = 0.43$). These correlations over time suggest the presence of significant variations in youth academic adjustment between admission to the agency and the mentoring experience. We could explain this variation by the different support sources and their interactions, which we examine further in the next section.

Table 2 also presents the patterns of associations between the control variables and the predictor and predicted variables. Two control variables show associations with several predictor and predicted variables: mentee's age and mentorship duration. Generally, older mentees reported more academic adjustment problems compared to younger mentees, as well as less positive perceptions of their relationship with mothers and teachers. However, perceived mentor support shows no relationship to mentee's age. Moreover, mentorship duration shows a positive association with perceived mentor support ($r = 0.21$, $p < .001$), but only very weak associations with academic adjustment indices during the mentorship. Note also the

Table 2 Zero-order correlations among study variables

ss	1	2	3	4	5	6	7	8	9
1. School positive attitude (F1–F5)	.								
2. Academic self-efficacy (F1–F5)	0.53***	.							
3. Assistance seeking (F1–F5)	0.47***	0.42***	.						
4. Problem solving (F1–F5)	0.44***	0.47***	0.67***	.					
5. School positive attitude (B)	0.58***	0.27***	0.26***	0.24***	.				
6. Academic self-efficacy (B)	0.35***	0.48***	0.21***	0.27***	0.40***	.			
7. Assistance seeking (B)	0.27***	0.30***	0.43***	0.28***	0.25***	0.06	.		
8. Problem solving (B)	0.27***	0.39***	0.34***	0.47***	0.27***	0.22***	0.47***	.	
9. Teacher support (B)	0.36***	0.32***	0.25***	0.23***	0.54***	0.16**	0.27***	0.35***	.
10. Mother support (B)	0.33***	0.36***	0.33***	0.31***	0.27***	0.12*	0.35***	0.42***	0.46***
11. Mentor support (F1–F5)	0.22***	0.32***	0.26***	0.27***	0.17***	0.05	0.12*	0.20***	0.14**
12. Mentor sex	− 0.03	0.04	− 0.10*	0.03	− 0.06	0.04	− 0.11*	− 0.03	0.05
13. Mentee sex	− 0.07	0.02	− 0.12*	0.02	− 0.07	0.02	− 0.11*	0.02	0.05
14. Mentor age	0.06	0.05	0.06	0.03	0.04	− 0.02	0.04	0.03	0.03
15. Mentee age	− 0.35***	− 0.24***	− 0.20***	− 0.27***	− 0.20***	− 0.29***	− 0.17***	− 0.23***	− 0.32***
16. Ethnic groups	0.01	0.00	0.04	− 0.00	0.01	− 0.03	0.02	0.00	0.00
17. Income category	− 0.09	− 0.01	− 0.05	− 0.11*	− 0.07	0.00	0.05	0.00	− 0.04
18. Match duration	0.11*	0.08	0.06	0.06	0.07	0.10*	0.12*	0.12*	0.06
19. Rematch	0.10*	0.09	0.03	0.05	0.04	0.09	− 0.03	− 0.01	0.09

	10	11	12	13	14	15	16	17	18

1. School positive attitude (F1–F5)

2. Academic self-efficacy (F1–F5)

3. Assistance seeking (F1–F5)

4. Problem solving (F1–F5)

Table 2 continued

	10	11	12	13	14	15	16	17	18
5. School positive attitude (B)									
6. Academic self-efficacy (B)									
7. Assistance seeking (B)									
8. Problem solving (B)									
9. Teacher support (B)									
10. Mother support (B)	.								
11. Mentor support (F1–F5)	0.26***	.							
12. Mentor sex	0.13*	0.02	.						
13. Mentee sex	0.17***	− 0.01	0.80***	.					
14. Mentor age	0.03	− 0.12*	− 0.06	− 0.04	.				
15. Mentee age	− 0.35***	0.05	− 0.12*	0.11	− 0.06	.			
16. Ethnic groups	− 0.03	− 0.01	− 0.05	− 0.03	0.03	0.03	.		
17. Income category	− 0.04	− 0.02	0.06	0.08	− 0.01	0.10*	− 0.12*	.	
18. Match duration	0.04	0.21***	0.08	0.09	0.01	− 0.07	− 0.06	0.06	.
19. Rematch	0.03	0.03	0.05	− 0.04	− 0.10*	− 0.09	− 0.05	− 0.01	− 0.09

F1, 1st follow-up 6 months after admission; F5, 5th follow-up 30 months after admission; B, Baseline assessment at admission

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

very high correlation between mentor and mentee sex ($r = 0.80$, $p < .001$), which reflects the usual practice of matching mentees with same-sex mentors.

Hierarchical Regression Analyses

In the preliminary analyses we tested our regression models with and without the control variables presented in Table 2. Because the two models obtained similar results, we decided to present only the simplified model excluding control variables, except for the baseline measures. Table 3 presents the regression results that predicted school attitude and feelings of academic self-efficacy. After controlling for the effects of initial school attitude (see top of table), maternal support ($\beta = 0.19$, $p < .001$) predicted school attitude during the mentorship. Mentor support added to this prediction, but only in interaction with both maternal and teacher support ($\beta = 0.10$, $p < .01$). Figure 1a illustrates this triple interaction effect, showing that mentor support predicted a more positive school attitude in two opposing conditions: when both mother and teacher were initially highly supportive (i.e., at 2 SD above the mean; $\beta = 0.43$) and when both mother and teacher support were extremely low (i.e., at 2 SD below the mean; $\beta = 0.23$). When mother and/or teacher support were moderate (i.e., at more or less 1 SD from the mean), the effect was nonsignificant. These results provide support for both the hierarchical compensatory model and the hierarchical conditional model. However, it is noteworthy that we obtained the strongest relationship when the mother was highly supportive.

The lower part of Table 3 presents the results related to feelings of academic self-efficacy. Above and beyond initial feelings of academic self-efficacy, maternal support ($\beta = 0.19$, $p < .001$) and mentor support ($\beta = 0.18$, $p < .001$) contributed uniquely to predict feelings of self-efficacy during the mentorship. In addition to the additive effect of mentor support, step 4 in the regression analysis indicates that mentor support interacted with maternal support ($\beta = 0.10$, $p < .05$) to predict feelings of academic self-efficacy (as illustrated in Fig. 1b). Figure 1b clearly shows that the contribution of mentor support to predict feelings of self-efficacy was conditional on maternal support: positive prediction when the mother was moderately and strongly supportive ($\beta = 0.32$ and $\beta = 0.43$), but insignificant prediction when maternal support was low. This finding supports the hierarchical conditional model.

Table 4 presents the regression results that predicted youth coping skills (assistance seeking and problem solving). Above and beyond initial behavior, maternal support ($\beta = 0.17$, $p < .001$) and mentor support ($\beta = 0.18$, $p < .001$) contributed uniquely to predict assistance seeking (see top of table). The mother X mentor interaction effects also added to the predictive model for assistance seeking ($\beta = 0.09$, $p < .05$). This interaction effect was decomposed, as illustrated in Fig. 1c. Mentor support positively predicted assistance seeking when the mother was initially highly supportive (i.e., support scores above the mean; $\beta = 0.30$ and $\beta = 0.38$), but not when mother support was low. Again, this result provides support for the hierarchical conditional model.

Table 3 Regression analyses predicting youth school attitude and academic self-efficacy

Step	Variable entered	Step 1 β	Step 2 β	Step 3 β	Step 4 β	Step 5 β	R²	ΔR²
School attitude								
1	School attitude (B)	0.58***	0.53***	0.52***	0.53***	0.53***	0.33***	0.33***
2	Teacher support (B)		− 0.01	0.00	0.00	− 0.02	0.37***	0.04***
	Mother support (B)		0.19***	0.17***	0.19***	0.19***		
3	Mentor support (F1–F5)			0.07	0.08	0.05	0.37***	0.00
4	Mother × mentor				0.03	0.04	0.38***	0.01*
	Teacher × mentor				− 0.05	0.01		
	Mother × teacher				0.04	0.05		
5	Mother × mentor × teacher					0.10*	0.40***	0.02*
Academic self-efficacy								
1	Academic self-efficacy (B)	0.48***	0.39***	0.36***	0.37***	0.37***	0.24***	0.24***
2	Teacher support (B)		0.07	0.08	0.06	0.07	0.28***	0.04***
	Mother support (B)		0.19***	0.15**	0.18***	0.18***		
3	Mentor support (F1–F5)			0.18***	0.21***	0.21***	0.31***	0.03***
4	Mother × mentor				0.10*	0.11*	0.32***	0.01*
	Teacher × mentor				− 0.06	− 0.08		
	Mother × teacher				0.01	0.01		
5	Mother × mentor × teacher					− 0.02	0.32***	0.00

F1, 1st follow-up 6 months after admission; F5, 5th follow-up 30 months after admission; B, Baseline assessment at admission
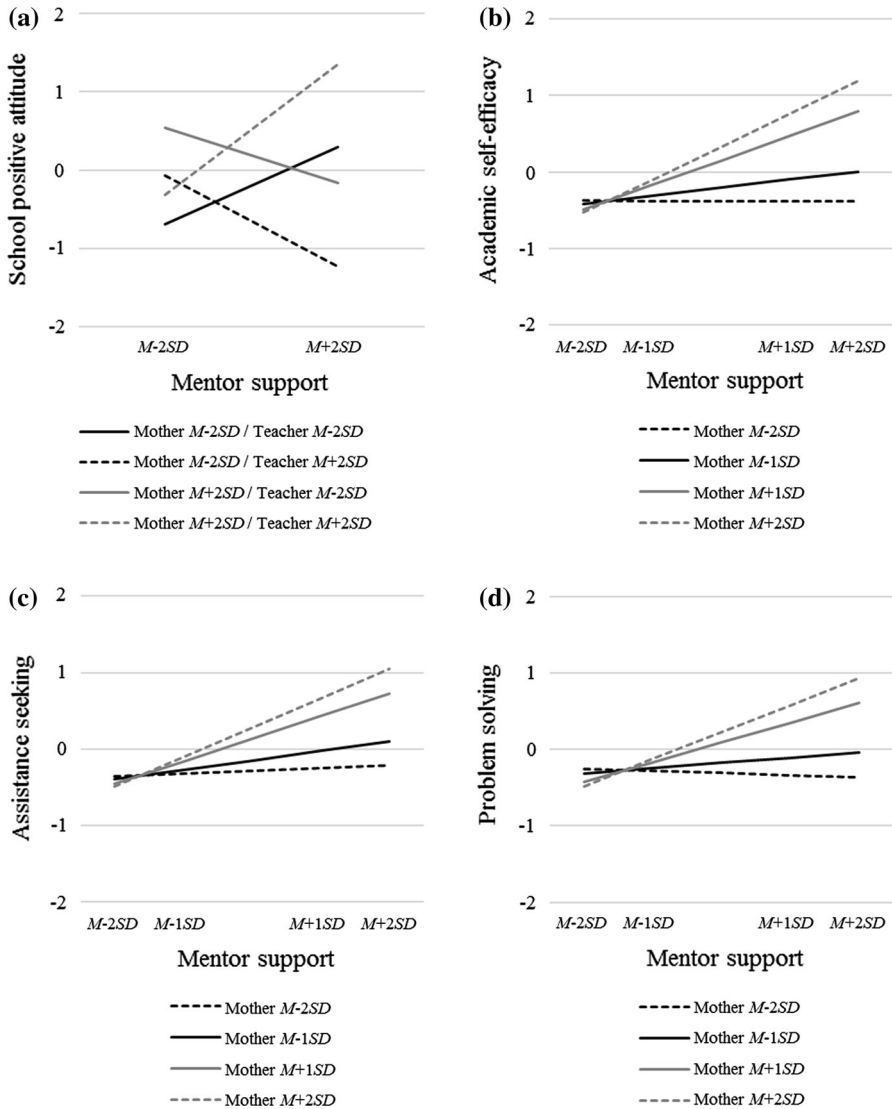
*$p < .05$; **$p < .01$; ***$p < .001$

Fig. 1 Interaction effects between mentor support and other adults' support (mother and teacher) in predicting youth school attitude (**a**), self-efficacy (**b**), and coping (**c**, **d**). **a** School attitude: mother × mentor × teacher. **b** Academic self-efficacy: mother × mentor. **c** Assistance seeking: mother × mentor. **d** Problem solving: mother × mentor. *Note M-2SD* = 2 standard deviations below the mean; *M-1SD* = 1 standard deviation below the mean; *M + 1SD* = 1 standard deviation above the mean; *M + 2SD* = 2 standard deviations above the mean. Very high or low mother and teacher support increased the effects of the mentor support in school attitude and high mother support increased the effect of the mentor support for self-efficacy, assistance seeking, and problem solving

The lower part of Table 4 presents the results related to problem solving behavior. Above and beyond initial coping behavior, maternal support ($\beta = 0.13$, $p < .01$) and mentor support ($\beta = 0.16$, $p < .001$) contributed uniquely and

Table 4 Regression analyses predicting youth assistance seeking and problem solving

Step	Variable entered	Step 1 β	Step 2 β	Step 3 β	Step 4 β	Step 5 β	R^2	ΔR^2
Assistance seeking								
1	Assistance seeking (B)	0.43***	0.35***	0.35***	0.34***	0.34***	0.18***	0.18***
2	Teacher support (B)		0.07	0.07	0.05	0.05	0.22***	0.04***
	Mother support (B)		0.17***	0.13*	0.15**	0.14**		
3	Mentor support (F1–F5)			0.18***	0.21***	0.21***	0.25***	0.03***
4	Mother × mentor				0.09*	0.09*	0.26***	0.01
	Teacher × mentor				− 0.04	− 0.03		
	Mother × teacher				− 0.03	− 0.03		
5	Mother × mentor × teacher					− 0.01	0.26***	0.00
Problem solving								
1	Problem solving (B)	0.46***	0.40***	0.39***	0.37***	0.38***	0.22***	0.22***
2	Teacher support (B)		0.02	0.02	0.02	0.00	0.23***	0.01*
	Mother support (B)		0.13**	0.10	0.14**	0.13**		
3	Mentor support (F1–F5)			0.16***	0.18***	0.16***	0.26***	0.03***
4	Mother × mentor				0.09*	0.10*	0.26***	0.00
	Teacher × mentor				− 0.03	0.02		
	Mother × teacher				0.03	0.04		
5	Mother × mentor × teacher					0.05	0.27***	0.01***

F1, 1st follow-up 6 months after admission; F5, 5th follow-up 30 months after admission; B, baseline assessment at admission

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

significantly to explain problem solving during the mentorship. The interaction effect of mother X mentor ($\beta = 0.09$, $p < .05$) contributes to this additive effect. Figure 1d illustrates this interaction effect, showing that mentor support contributed to problem solving, and particularly when the mother was initially supportive (i.e., when the mother support score was above the mean; $\beta = 0.26$ and $\beta = 0.36$). These results support the hierarchical conditional model.

Discussion

In line with the systemic model of the youth mentoring intervention (Keller, 2005; Keller & Blakeslee 2013) and theoretical perspectives on relationship specialization and substitution in social networks (Rook & Schuster, 1996; Cantor, 1979), our paper investigated three models of how mentor support contributes to youth academic adjustment. The additive model suggests that mentor support makes a unique contribution to youth academic adjustment that cannot be explained by the support received from teachers and parents. The hierarchical compensatory model suggests that the effect of mentor support would operate only when parental and/or teacher support is lacking. According to the hierarchical conditional model, the effect of mentor support operates only if parental and/or teacher support are of sufficient quality.

Our examination of the three models showed that, after controlling for individual differences in maternal and teacher support, emotional support in mentoring predicted positive changes in feelings of academic self-efficacy and coping strategies (i.e., assistance seeking and problem solving). However, mentor support did not directly predict school attitude (as discussed further below). Although these initial results suggest that mentoring support makes a unique and independent contribution to youth academic adjustment (Karcher, 2005; Larose et al., 2012; Morrow-Howell, et al., 2009; Randolph & Johnson, 2008; Rhodes et al., 2000; Tyler & Lofstrom, 2009), all our tested regression models showed that the strength of these predictive associations varied systematically according to the perceived quality of emotional support in the relationship with the mother.

We found hierarchical conditional effects for the four academic adjustment indicators (school attitude, academic self-efficacy, assistance seeking, and problem solving). BBBS mentor support predicted changes in academic adjustment mainly when the mother was highly supportive. This result is consistent with the findings of studies that have shown that a minimum of parental support was required for mentor support to make a difference in youth academic adjustment (Soucy & Larose, 2000). It also confirms the importance of parental involvement in the mentoring process (Kaye & Smith, 2014; Spencer & Basualdo-Delmonico, 2014). However, our findings contradict studies that have reported that mentoring was beneficial for youth who received moderate support from their social network, but not for youth who reported receiving either high or low support (Schwartz, Rhodes, Chan, & Herrera, 2011). One possible explanation for the discrepancy between our results and those of Schwartz and colleagues may be methodological in nature. That study assessed support sources other than mentoring in the overall social environment,

without distinguishing between parents and teachers (or peers). It is possible that combining the various support sources (e.g., mother, teacher, and peers) acts to confound the real and complementary contributions of BBBS mentor support. Our results strongly suggest that when support by the mother is treated separately, the effects of BBBS mentor emotional support on academic adjustment are more conditional than compensatory.

We propose two explanations of this conditional effect. First, we consider a cognitive developmental perspective, based on attachment theory (see Bowlby, 1969; Goldberg, Muir, & Kerr, 2013). Accordingly, as children grow up, they develop representative models of each of their attachment relationships. Children build these so-called "internal working models" from the accumulated experiences of support provided by their parents (or other attachment figures) when they are distressed. These cognitive models of parental attachment guide children's perceptions, emotions, and behaviors when distressful situations occur in other relationships. Therefore, they should have considerable predictive power for the quality of adjustment stemming from support received from other types of relationships. In our study, it is plausible that mentored youth who had constructed negative cognitive models of relationships with their mother (expressed as low perceived support) would be less reassured by their mentor's intentions to support them, less receptive to their mentor's efforts to support them, and by the same token, less emotionally engaged in the mentoring relationship. The positive correlation between perceived maternal support and perceived mentor support in this study partly supports this hypothesis. Consequently, a youth's negative cognitive attachment to the mother would hinder the mentor's efforts to support academic adjustment.

The second hypothesis draws on a social perspective according to Social Capital Theory (Coleman, 1988). In this perspective, as children develop, they form social relationships that provide them with personal resources (sometimes called "assets") that they can use to their advantage in various life situations (e.g., school, work, relationships with peers and adults). These personal resources include the knowledge, abilities, and attitudes that benefit the child's social life (e.g., well-being) and adaptation (e.g., coping strategies). When children grow up in an unsupportive environment, they have less social capital, and therefore fewer resources to help them adapt to new situations. In our study, it is possible that youth with less supportive mothers lacked personal resources, which limited their ability to benefit from the support and academic help offered by their mentor. Here again we may evoke the saying that "the rich get richer" (Barrera & Bonds, 2005). According to this hypothesis, stronger mentoring interventions, in terms of both duration and depth, might help compensate for a less supportive family environment.

Whereas mentoring might conceivably constitute a "corrective experience" for youth who have had unsatisfactory relationships with their parents (Rhodes, 2005), the overall portrait of the results of our study do not support this hypothesis. If the corrective experience had been conclusive, we would have seen interaction effects for all our adjustment variables, indicating that mentor support acts when perceptions of mothers' and/or teachers' support is low. Instead, we observed the

opposite. It is possible that a compensatory effect of mentoring would operate more strongly when support is stronger, or when it is provided earlier in the child's development. It is also possible that the mentoring compensated for the lack of parental support with respect to the other indicators considered in this study (e.g., self-confidence, vocational development). Third, it is also possible that mentor support attenuated the negative effects of certain occasional experiences (e.g., with classmates) without necessarily countering the negative effects of emotional experiences that had accumulated throughout the development span (e.g., with parents). Our results call for a more thorough investigation of Rhodes' (2005) hypothesis, and in reference to different contexts and age groups.

Two further results of this study merit attention. In our exploration of the interaction effects, we also found a hierarchical compensatory effect. Emotional support by a BBBS mentor predicted positive changes in school attitude in youth who received little support from both mother and teachers. Although this prediction was weaker than that for youth with a highly supportive mother and teachers, this finding suggests that BBBS mentor support also help at-risk youth be more liable to develop a positive school attitude. It is possible that, in light of previously experienced parental and teacher support, distinct processes would operate in the way that BBBS mentor support acts on the development of a positive school attitude. According to attachment theory (see Goldberg, Muir & Kerr, 2013) as well as empirical research on student–teacher relationships (Wenzel & Wigfield, 2009), youth who enjoy strong parental and teacher support are more secure and more inclined toward social exploration. For these students, mentor support may have provided a safe base from which to explore: a space where they could ask questions, identify their interests and needs, and make plans for the future. This type of situation could foster the development of positive school attitudes. For their part, youth with poor parental and teacher support would be more insecure in their interpersonal relationships. For them, the mentoring relationship could have provided a comforting base where they could learn to manage their anxiety and develop positive school attitudes. Since this finding comes from a triple interaction, and considering the size of our sample, we must remain cautious before concluding in the presence of a compensatory effect. Further studies are needed to better understand the distinct mentoring mechanisms that operate in fostering school attitude for youth with higher and lower parental and teacher support.

The examination of the correlations between variables also revealed an interesting finding. We showed that older mentees had more academic adjustment problems and less positive perceptions of their relationships with mothers and teachers than did younger mentees. At the same time, they had similar perceptions of mentor support. In this study, the mentees' age ranged from 6 to 16 years. These results suggest that, despite the greater academic problems for older youth, and despite the low (or more critical) perceptions of their mother's support, there was no apparent effect on their appraisal of the support provided by their mentor. Indirectly, this result supports the notion that mentoring remains a useful intervention up to the end of adolescence.

Study Limitations and Strengths

This study includes certain limitations that should be mentioned. First, we measured academic adjustment from the youth's perspective only. Given the geographic scale and the age diversity of the sample in this longitudinal Canadian study, and given that we focused on mentoring practices, we did not consider teachers' assessments. Teachers' reports of improvements in academic adjustment following mentoring would increase the external validity of our findings. Second, we considered support as a one-dimensional construct, and we accounted for the emotional component only (e.g., "My mentor, mother, teacher is there for me when I have a problem"). It is possible that other forms of mentor support (e.g., tutorial, vocational, social) would show other predictive relationships with academic adjustment, along with different interactions with the support provided by parents and teachers. Further studies are needed to draw a more detailed portrait of mentor support. Third, we used a predictive correlational design. In future studies, researchers could train mentors, parents, and teachers to provide various types of support, and they could use experimental designs to assess the combined effects of the training on youth academic adjustment. This approach could increase the causal inference between mentor support and youth academic adjustment. Fourth, our study explored only the interaction effects between mentor's support and support provided by relationships with mothers and teachers. It would be informative to consider interactions with support by fathers and friends as well. Finally, our study examined academic outcomes only, focused on mid-term mentoring relationships (20 months on average), and included mostly younger adolescents. It is therefore possible that the hierarchical conditional effects we observed are limited to the academic sphere and to mentorships of moderate duration with younger adolescents. Consequently, it is also possible that we would find hierarchical compensatory effects in other circumstances.

Despite these limitations, this study makes several contributions to the literature and practice. It is one of the rare longitudinal studies that have attempted to predict changes in academic adjustment over a 30-month period. It is also one of a few studies that have compared the formal support provided by mentors to informal support provided by other adults in the youth's sphere. According to the systemic model of mentoring (Keller, 2005; Keller & Blakeslee, 2013), we should conceive of the mentoring relationship as a relational system that interacts with other relational systems (e.g., with parents and teachers) and that continuously influences and is influenced by these other systems. Finally, the data for this study were gathered from 20 Canadian agencies located in major urban centers and their surrounding regions, which supports the generalization of our results.

Implications for Practice and Conclusions

Our findings indicate that the effects of BBBS support on youth academic adjustment were conditional on the support provided by the mother. In light of these results, BBBS agencies are advised to extend their interventions to include parents so as to encourage them to participate actively in the mentoring process. This could

take place at the time of admission to the agency, during the mentoring, or at the final meeting. Accordingly, an approach in which agencies collaborate with families, as in the qualitative study by Spencer and Basualdo-Delmonico (2014), appears to be a promising avenue for BBBS agencies. This would go beyond simply informing the parents of their roles and responsibilities along with the agency's expectations: the parents would contribute as experts, assets, and allies in a concerted effort to meet their child's needs, and would have a voice in the mentoring process. Agencies that adopt this approach strongly encourage two-way communication between mentors and parents, and they take the parents' point of view into account when making any decisions concerning the child. Based on our results, we strongly recommend BBBS agencies to adopt this type of approach.

In conclusion, this study clearly shows that emotional support by a BBBS mentor interacts with support from the mother to predict academic adjustment in youth. It appears that the effects of BBBS support on academic adjustment are conditional on the presence of and quality of maternal support. On the other hand, there was less evidence that BBBS support compensates for the absence or inadequacy of support from mother and/or teachers. These findings invite us to revisit the widely held hypothesis that mentoring can be a corrective experience for youth (Rhodes, 2005), at least in terms of academic outcomes, and they suggest the need for further studies to gain a deeper understanding of the processes at play in the conditional and compensatory effects of mentoring.

Compliance With Ethical Standards

Conflict of Interest The authors declare they have no conflicts of interest.

Human Participants Statement I (Simon Larose) also confirm that the study was ethically in line with human participants' research.

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