The influence of meeting time on academic outcomes in school-based mentoring

1. Introduction

Youth mentoring programs in the United States have experienced tremendous growth in the past two decades, with approximately three million youth in one-to-one structured mentoring relationships (Rhodes & Lowe, 2009). The fastest growing form of mentoring is school-based mentoring (SBM) (MENTOR/National Mentoring Partnership, 2006). In SBM, youth meet with mentors during or after school in the school building, unlike traditional community-based mentoring (CBM) where meetings take place outside the school setting and each match chooses where and when they will meet. The rise in SBM programs stems, in part, from hopes that mentoring can be harnessed to improve academic outcomes. Particularly since the advent of high-stakes tests under the No Child Left Behind Act in 2001, there is increased pressure on schools to raise academic performance. Although recent random assignment impact evaluations have shown relatively few statistically significant effects of SBM (Bernstein, Rappaport, Olsho, Hunt, & Levin, 2009; Herrera, Grossman, Kauh, Feldman, & McMaken, 2007; Karcher, 2008a), a recent meta-analysis of these evaluations (Wheeler, Keller, & DuBois, 2010) concluded that SBM was modestly effective in improving selected outcomes, including increased scholastic efficacy, lower rates of truancy, absenteeism, and school-related misconduct, as well as improved perceptions of support from non-familial adults and peer support.

Interpretation and application of these results is complicated by the fact that there is considerable variation in the implementation of SBM programs. Several studies have demonstrated variability in effects across different subgroups of youth and programs (e.g., DuBois, Portillo, Rhodes, Silverthorn, & Valentine, 2011; Grossman, Chan, Schwartz, & Rhodes, 2012; Karcher, 2008a; Karcher, Davidson, Rhodes, & Herrera, 2010; Schwartz, Rhodes,

Chan, & Herrera, 2011). One potentially important area of variation that has not previously been examined is the time of day during which SBM programs are offered. Specifically, some SBM programs offer mentoring after school or during lunch, while other programs offer it during the school day, which generally requires pulling participating students from other school activities and classes (Herrera, 2004; Herrera et al., 2007). Given that pulling students from class could potentially disrupt academic instruction, it is important to consider how these differences in implementation influence the academic outcomes of the intervention. The present study draws on data from a national evaluation of Big Brothers Big Sisters (BBBS) SBM programs (Herrera et al., 2007) to examine whether the timing of mentor-youth meetings is associated with differential academic impacts.

1.1 Mentoring and Academic Achievement

Research suggests that the elementary and middle school years are crucial in determining academic self-concept and future academic success (e.g., Archambault, Eccles, & Vida, 2010; Helmke & van Aken, 1995; Huang, 2011). Youth who experience academic difficulties often feel inadequate at school, causing them to disengage or act out to avoid the embarrassment of being unable to keep up with peers (e.g., Finn, 1989; Laird, Jordan, Dodge, Pettit, & Bates, 2001). Moreover, eighth grade reading achievement and ninth grade academic performance play a major role in predicting high school graduation and college enrollment (Lesnick, Goerge, Smithgall, & Gwynn, 2010). Providing academically at-risk students with the support and attention they need is critical to their future success.

SBM programs are well positioned to reach academically at-risk youth and provide them with a range of benefits. Theory indicates that mentoring relationships can influence a range of cognitive developmental processes (Rhodes, 2005). This is supported by research on the

collaborative and social nature of learning, suggesting that mentors can facilitate the development of new cognitive processes and skills in children and adolescents (Radziszewska & Rogoff, 1991; Vygotsky, 1978). Empirical evidence suggests that mentoring may be effective in improving academic outcomes among at-risk youth, in particular (e.g., DuBois et al., 2011; Thompson & Kelly-Vance, 2001). Moreover, SBM programs may be uniquely suited to influence academic outcomes due to being located within schools. Participants in SBM programs are more likely than those in community-based programs to be referred by teachers. In addition, because the programs are located in schools, mentors may be more inclined to assist with school work, discuss youths' school experiences, and communicate with teachers and school personnel. In fact, studies suggest that SBM's strength is likely in its ability to affect school-related outcomes (e.g., Diversi & Mecham, 2005; Herrera, Grossman, Kauh, & McMaken, 2011; Karcher, 2008a; Portwood & Ayers, 2005; Portwood, Ayers, Kinnison, Waris, & Wise, 2005; Wheeler, Keller, & DuBois, 2010). It should be noted, however, that the benefits that have been reported tend to be behaviors and attitudes that may contribute to school success, such as truancy, self-perception of academic abilities, connectedness to school and to peers, and school misconduct, rather than academic performance (Wheeler, Keller, & DuBois, 2010).

When the impacts of a range of programs are combined, however, positive outcomes can be masked by neutral or even negative outcomes associated with less effective programs. For this reason, it is important to examine program factors that may influence the effectiveness of the intervention. One factor in SBM that could greatly influence academic impacts is the timing of the intervention itself. Whereas some matches meet during the school day, others meet after school. This means that some programs provide youth with additional positive activities (academic or otherwise) beyond those that are part of the school day, while other programs

provide mentoring by pulling students from other activities during the school day, in some cases supplanting academic activities. Although some "during-school" programs meet during lunch, most meet at other times in the day, including during class time, which could have detrimental effects on academic performance. By contrast, when mentors meet with their mentees during the after-school hours, they can advance students' understanding of classroom material. Rather than compete with school activities, after-school mentoring (or mentoring during lunch time) can play a valuable role in helping students to consolidate what they have learned, identify areas in need of additional assistance, and reinforce the value of school.

1.2 Research on Pullout Programs and Academic Achievement

In fact, research in education has long given mixed reviews to pullout programs that occur during the school day (e.g., Johnston, Allington, & Afflerbach, 1985). One study suggested that the more time at-risk students spent in pullout programs, the worse their progress (Glass & Smith, 1977). A more recent study comparing an inclusive special education program (providing services within the context of the general education classroom) versus a pullout program for students with disabilities found that student in the inclusive program earned higher grades than those in the pullout program and did not differ on measures of behavioral infractions and attendance (Rea, McLaughlin, & Walther-Thomas, 2002). Other research emphasizes the advantage of supplementary programs over compensatory programs, that is, the importance of programs providing additional enrichment time to at-risk students as opposed to substituting an intervention for regular class time (e.g., Piluski, 1994). A study surveying student preferences for service delivery of specialized reading instruction revealed that the majority of students prefer to receive support within their regular classroom from their teacher (Jenkins & Heinen, 1989). A teacher's account also describes some of the dangers of pullout programs noting, "At first, I was

concerned about the sheer loss of time—travel time and time spent in the pullout program rather than in class—but later I became alarmed over some students' sense of disengagement, their lack of connection and their feeling disheartened at not understanding what was going on when they reentered the classroom" (Brandts, 2005, p.60).

Providing mentoring during the school day not only may carry with it many of the risks associated with pullout programs delivering academic instruction, but it could potentially be more detrimental academically since it is not a primarily instructional intervention. Although mentoring may include academic activities, in BBBS SBM programs, only approximately one quarter of mentors report spending "a lot" or "most" of their time engaging in activities such as tutoring or homework help, while the majority (71%) reported spending a lot of their time engaging in casual conversation and approximately half spent a lot of their time playing indoor games (Herrera, 2007). As a result, it is posssible that mentored students in programs that meet during the school day may be receiving less instructional time than their nonmentored peers. Research indicates that instructional time is associated with student learning generally (Brown & Saks, 1986; Fredrick & Walberg, 1980; Zeith & Cool, 1992), and specifically with achievement in math (Aksoy & Link, 2000). Notably, the association between instructional time and achievement was found to be particularly strong for students with lower initial abilities (Brown & Saks, 1986). This suggests that offering mentoring during the school day (outside of lunch) may be particularly problematic for students who are already academically at-risk.

Despite the risks associated with pulling students from class, to date, research on SBM has not distinguished between programs that provide mentoring after school or during lunch versus those that provide mentoring at other times during the school day. Yet it is possible that this difference may significantly influence the academic benefits that youth derive from such

programs. Since academic improvement is a major goal of most SBM programs, including

BBBS SBM programs (Portwood & Ayers, 2005; Herrera et al., 2004; Herrera et al., 2011), it is

important to examine factors that could influence its impact on academic outcomes.

1.3 Current Study

The current study employs data from the national evaluation of Big Brothers Big Sisters

school-based mentoring programs (Herrera et al., 2007; Herrera et al., 2011) to investigate how

mentor-student meeting time may influence the impact of the intervention. Our analyses sought

to determine whether timing significantly moderated the effects of the program on academic

outcomes. Specifically, we hypothesized that matches in programs that met during the school

day but not during lunch would have negative effects on academic outcomes. Meanwhile,

matches that met at other times (i.e., after school or during lunch) would have positive effects on

academic outcomes. We hypothesized that this effect would be most pronounced for students

who were academically at-risk at baseline.[1]

2. Method

2.1 Participants

---

[1] Herrera et al. (2007) conducted related analyses in their original report and found no significant effects. However, their analyses were designed to address the methodological question of whether teachers rate students differently if they receive mentoring at a time the teacher would likely know they are receiving mentoring (i.e., during the school day) as opposed to at a time when the teacher may not know they are receiving mentoring (i.e., after school). Thus, the analyses examined the program's timing using a variable that simply reflected whether the program was implemented during or after school hours and assessed only teacher-reported outcomes. The current study explores the possibility of differential academic impacts on youth if they are receiving mentoring at a time when they would otherwise be engaged in school activities. For that reason, we approached our analyses differently. For example, (1) our meeting-time variable includes programs that met during the school day but *not* during lunch; (2) we include both teacher- and youth-reported academic outcomes and exclude non-academic outcomes; and (3) we investigate this effect both within the full sample and solely among academically at-risk students.

Youth in this random assignment impact evaluation were recruited from ten Big Brothers Big Sisters agencies across the country (serving a total of 71 participating schools), all of which had been operating SBM programs for at least four years, served at least 150 youth, recruited at least two different types of volunteers (e.g., high school students and professionals), and had strong leadership in place (Herrera et al., 2007). All youth who met the following criteria were invited to participate in the study: 1) were in fourth though ninth grades at the start of the study; 2) had parental consent to participate; and 3) had not been referred because of a crisis (e.g., referred by Child Protective Services). Of the total 1,139 youth participating in the study, 54% were female. Thirty-seven percent reported as White, 23% as Hispanic/Latino, 18% as Black/African American, 6% as Native American, 1% as Asian/Pacific Islander, 13% as mixed race, and 3% as Other. Ten percent were identified by teachers as having limited proficiency in English (LEP). Sixty percent of participants were in elementary school (fourth or fifth grade), 34% were in middle school (sixth through eighth grade), and 6% were in ninth grade. Sixty-nine percent of youth were receiving free or reduced-price lunch, and 39% lived in a single-parent home. Based on teacher reports, 51% of youth were performing below grade level and/or needed improvement in their overall academic performance.

Of the 554 mentors who completed baseline surveys, nearly half (48%) were high school students, an additional 18% were college students, and the remaining volunteers were non-student adults. Seventy-two percent were female, and 77% were White.

2.2 Procedure and Intervention

Youth were recruited to participate in the study through BBBS agencies and participating schools. Youth participants completed baseline surveys at their school, administered by on-site researchers in small group settings. All of the 1,139 youth participants completed baseline

surveys. Teachers were also given surveys to complete individually. For the majority of youth in middle and high school settings, youth's science, social studies, English as a Second Language (ESL) or homeroom teacher completed the survey. Teachers of 1,009 youth (of the 1,139) completed baseline surveys.

After youth completed the baseline survey, they were randomly assigned to the treatment group to be matched with a mentor ($n = 565$) or the control group to be placed on a waiting list ($n = 574$). Follow-up surveys were administered at two subsequent time points: the spring of the first school year (1,067 youth surveys and 959 teacher surveys were completed) and fall of the second school year (968 youth surveys and 920 teacher surveys were completed). A survey firm administered follow-up surveys at youth's schools or by phone if youth had moved or were absent from school. Surveys were available in both Spanish and English. In addition, surveys were administered in the spring of the first school year to case managers asking about program characteristics (100% of case managers responded). Principals were also asked to complete a brief survey about their schools (72% completed the survey).

Although mentors committed to meeting with youth for at least one school year, matches generally began after the start of the school year to allow for volunteer recruitment, screening, and training as well as school scheduling, and some matches terminated prematurely during the first year. In fact, at the time of the first follow-up survey, only sixty-four percent of youth in the treatment group were still meeting with the mentor with whom they were originally matched. As a result, youth had received an average of 4.7 months of mentoring by the time of the first follow-up in the spring of the first school year, meeting an average of 3.1 times per month. By the second follow-up survey (during the fall of the second school year), 48% of youth were no longer meeting with a mentor, in many cases because youth had transferred to a new school. Of

those youth who were still matched, 41% were meeting with the same mentor they had met with during the previous school year, and 11% were meeting with a new mentor.

2.3 Measures

Although the original impact study included a range of outcomes including academic outcomes, problem behaviors, and social and personal well-being (Herrera et al., 2007), this study focused solely on academic outcomes. In recognition of the significant role mentor relationship quality and match duration play as intermediate outcomes in mentoring (Grossman et al., 2012; Grossman & Rhodes, 2002; Herrera et al., 2007; Parra, DuBois, Neville, Pugh-Lilly, & Povinelli, 2002), these variables were also included as dependent variables in the current study. The same covariates were chosen as those used in the original impact study. We did not include data from the second school year because nearly half of the matches (48%) terminated at the end of the first school year. Therefore, only baseline (T1) and first follow-up (T2) data were used in the current analyses.

Teacher-Reported Outcomes (T1 & T2)

Overall Academic Performance was determined based on teachers' ratings of youth's academic performance on a single-item five-point scale, with 1 = "below grade level", 2 = "needs improvement", 3 = "satisfactory", 4 = "very good", and 5 = "excellent" (Pierce, Hamm, & Vandell, 1999). Using the same scale, teachers were also asked to rate youth's performance in individual subjects including *Reading Performance, Math Performance*, *Science Performance*, and *Social Studies Performance*. *Language Performance* was calculated as the mean of two items, teachers' ratings of youth's performance in oral language and written language, using the same response set ($\alpha_1 = .87$, $\alpha_2 = .86$).

Unexcused Absences were measured using a single-item teacher-reported measure in which teachers reported the number of times in the previous four weeks that youth had been absent from school without an excuse.

Youth-Reported Outcomes (T1 & T2)

Grades were measured using a single-item measure in which youth reported their grades on their last report card using a scale of 1 to 8, where 1 = F, 2 = D, 3 = C-D, 4 = C, 5 = B-C, 6 = B, 7 = A-B, and 8 = A.

Self-Perceptions of Academic Abilities was measured using a six-item youth-reported subscale of the Self-Perception Profile for Children (SPPC) (Harter, 1985). The items assessed youth's estimation of their own academic competence, using items such as, "I do very well at my class work" and "I feel that I am just as smart as other kids my age." The original version of the instrument was adapted using a four-point likert scale, ranging from 1 = "not at all true" to 4 = "very true." The measure was calculated as a mean of the six items, with higher scores reflecting higher levels of self-perceived academic abilities (α_1 = .70, α_2 = .72).

Match Characteristics (T2 only)

Youth Emotional Engagement in the mentoring relationship was measured using an eight-item youth-reported scale including items such as, "When I'm with my mentor, I feel excited" (Jucovy, 2002). The items were scored on a four-point likert scale, ranging from 1 = "not at all true" to 4 = "very true" and a mean score was calculated, with higher scores indicating higher levels of emotional engagement (α_2 = .84).

Match duration was measured with a single item variable referring to the total number of days youth had been in their original match as measured at T2.

Covariates (T1 only)

Substance Use was measured using four youth-reported items adapted from the Self-Reported Behavior Index (Brown, Clasen, & Eicher, 1986). Youth reported whether they had ever used alcohol, tobacco, marijuana and other drugs, and, if so, how frequently during the past three months. The response scale and the reference period were modified for the current study (the original measure asks for a report of use in the past month). The items were combined to form a dichotomous variable where "1" indicates any previous substance use and "0" indicates no reported history of substance use.

Extracurricular Involvement was measured as the sum of six items reported by youth, including after-school sports participation, after-school homework help or tutoring, and involvement in activities or clubs outside of school.

Stress was assessed using the Stressful Life Events measure (adapted from the Social Readjustment Rating Scale by Holmes & Rahe, 1967). Youth were asked if over the prior 6 months they had experienced any of 12 events such as, "Have you moved or changed where you live?" or "Was someone you know well hurt badly or very ill?" and responded "yes" or "no" to each question. The measure was calculated as a sum of the 12 items, with higher scores indicating greater stress.

Program and School Characteristics

Meeting Time was measured using a single-item school-level variable, completed by program staff (i.e. BBBS agency staff members who supervise mentoring relationships within individual programs), asking whether the program was implemented: during the school day excluding lunch; during lunch; after school; during the school day including lunch; and both during the school day and after school.

Length of Meetings was measured using a single-item school-level variable asking program staff to report how long matches met at each meeting on a scale from 1 to 5, where 1 = 0-45 minutes, 2 = 46-60 minutes, 3 = 61-90 minutes, 4 = 91 minutes to 2 hours, and 5 = more than 2 hours.

Academic Focus was measured using a single-item school-level variable asking program staff to report the percentage of match meeting time spent on academic activities on a scale from 1 to 4, where 1 = 0 to 25% and 4 = 76 to 100%.

High School Mentor was measured using a single-item mentor-reported variable asking if the mentor was a high school student.

Activity Choice was measured using a single-item school-level variable asking program staff to indicate if matches generally chose their activities together (as opposed to the mentor choosing alone, the youth choosing alone, the teacher, the school or the BBBS agency).

Presence of Case Manager was measured using a single-item school-level variable asking program staff to indicate how often a case manager was present for match meetings on a scale from 0 to 4 where 0 = never and 4 = always.

Years Program has Run in School was measured using a single-item school-level variable asking program staff the number of years the program has been implemented in the school.

Teacher Challenges was measured using a single-item school-level variable asking program staff which, if any, challenges they had experienced during the year related to teachers. Options included lack of referrals, lack of knowledge about the program, conflict in goals for the program, and not allowing youth to attend consistently.

School Characteristics were collected in the survey administered to principals. Principals reported the percentage of students in the school on free or reduced-price lunch, the teacher-student ratio, and the percentage of students who attend other programs before or after school.

2.4 Statistical Methods

A two-level, random-intercept regression model was used to investigate whether the time of day during which matches met moderated the impact of mentoring, while accounting for clustering by school. Specifically, the model tested for an interaction between participant treatment status and a dummy variable for whether participants (including those in both the control and the treatment group) were in a school where matches met during the school day, excluding lunch, versus those who were in a school where matches met after school or during lunch. Intent-to-treat analyses were conducted in order to maintain randomization, regardless of whether youth were still meeting with their mentors at the time of the follow-up assessments. This model was conducted both using the full sample and with a subsample of those students who were deemed academically at-risk at baseline. Youth were defined as being academically at-risk if teachers rated their overall academic achievement as "below grade level" or "needs improvement" at baseline. As in the original impact study, covariates were used to account for differences in youth characteristics, namely, age, minority status, receiving free or reduced-price lunch, gender, stress, involvement in extracurricular activities, and substance use,[2] along with the baseline measurement of the outcome variable being examined. We also examined whether meeting during the school day, excluding lunch, predicted relationship quality or match length. In addition, we explored potential differences in program and school characteristics based on meeting time that may contribute to any interaction effects observed.

---

[2] Youth in the control group reported slightly higher levels of substance use than treatment youth at baseline (15% vs. 11%; $\chi^2 = 4.52$, $p < .05$), thus this variable was also included as a covariate.

3. Results

3.1 Descriptive Analyses

Within the treatment group, 44% of youth were in programs that met after school, 25% were in programs in which matches met during the school day, excluding lunch, 6% were in programs in which matches met during lunch, 15% were in programs in which some matches met during the day while others met after schools, and 11% were in programs in which some matches met during lunch and some met during other times within the school day. For the purpose of this study, we did not include programs that reported that matches could meet at more than one time, because we could not verify when individual matches met. As a result, our total sample consisted of 838 youth (416 in the treatment group, and 422 in the control group). Within the treatment group, 137 youth were in programs in which matches met during school,[3] and 279 youth were in programs in which matches met after school or during lunch.

First, we examined baseline differences between youth based on meeting time, including gender, grade, minority status, and free/reduced-price lunch status (see Table 1). Youth in programs that met during school were less likely to be of a minority background ($p < .01$) and less likely to be on free/reduced lunch ($p < .05$). There were no significant differences in gender or grade in school. We also examined potential differences by meeting time on baseline measurements of all outcome variables included in the model, but did not detect any baseline differences on any of the outcome variables.

3.2 Mentoring Impacts by Meeting Time

No significant interaction effects were detected in the full sample between meeting time and treatment status. Among the subset of students that were academically at-risk ($n = 359$),

---

[3] For the remainder of the paper, "during school" will be used to refer to meeting during the school day, excluding the lunch period.

however, significant interaction effects were observed (see Table 2). There were significant

negative interaction effects between meeting during school and treatment status for math and

language ($p < .05$), and marginally significant negative interaction effects for overall academic

achievement ($p = .09$) and science ($p = .10$).

We then examined the impact of the intervention on academically at-risk students

separately in programs where matches met during school and in programs where matches met

either after school or during lunch (see Table 2). In programs where matches met during school,

no significant positive effects from mentoring were detected and a significant negative effect was

observed on math performance ($p < .01$), when compared with the control group. In programs

where matches met after school or during lunch, a significant positive effect was observed for

language and reading ($p < .05$), and a marginally significant effect was observed on overall

academic achievement ($p = .08$), when compared with the control group. Table 3 presents means

and standard deviations for outcome variables among youth in the control group, youth mentored

during school, and youth mentored after school or during lunch. Meeting time did not

significantly predict relationship quality or match length.

3.3 Potential Factors Contributing to Interaction Effects

We also investigated potential differences in program characteristics between programs

that met during school versus those that met after school or during lunch. Specifically, we tested

for differences in the percentage of high school mentors, the presence of case managers during

match meetings, the length of meeting time, the proportion of match time spent on academic

activities, and how activities were chosen (i.e., whether activities were chosen collaboratively by

the youth and mentor). No significant differences were observed for percentage of high school

mentors or how activities were chosen. Programs that met during school time, however, had

shorter match meetings, $F(1, 357) = 113.56$, $p < .01$ and spent less time on academic activities, $F(1, 357) = 40.43$, $p < .01$. Notably, the average percentage of time spent on academic activities was less than 50% for programs in both groups.

We also tested for differences in school characteristics including the percentage of students receiving free or reduced-price lunch, the teacher-student ratio, the percentage of students in the school attending other before- or after-school programs, and how long the program had been implemented in the school. Programs that met during school had a significantly lower proportion of students receiving free or reduced-price lunch, $F(1, 357) =$ 16.26, $p < .01$, and a marginally significantly greater percentage of students attending other before- or after-school programs, $F(1, 242) = 3.46$, $p = .06$, than those that met after school or during lunch. In addition, programs that met during school tended to have been implemented in the school for a greater number of years, $F(1, 357) = 11.49$, $p < .01$. No differences were found in the teacher-student ratio across these schools.

To investigate the possibility that the differences in impacts based on meeting time were actually driven by these program and school differences, we conducted our regressions again, testing for interaction effects after including as covariates those variables on which significant differences were observed. Specifically, in addition to the youth characteristics included in the original regression, we included the following program- and school-level variables: percentage of students in the school receiving free or reduced-price lunch, the percentage of students in the school attending other before- or after-school programs, how long the program had been implemented in the school, the presence of case managers during match meetings, the length of match meetings, and the percentage of match time spent on academic activities. Although these additional covariates reduced the strength of some effects, the same trends remained for all

variables, and significant interaction effects were still observed for math, $B = -.53$, $SE = .26$, $p <$ .05, and marginally significant interaction effects were observed for reading, $B = -.40$, $SE = .23$, $p = .09$.

Finally, to investigate the possibility that meeting time may influence interactions with teachers, we examined differences in reports of program challenges related to teachers. More frequent reports of challenges due to conflicts with teachers over goals for the program (28% vs. 0%; $\chi^2 = 74.80$, $p < .01$) and teachers not allowing youth to attend the program consistently (39% vs. 5%; $\chi^2 = 67.82$, $p < .01$) were observed in programs that met during school as opposed to after school or during lunch. In contrast, fewer reports of teachers' lack of knowledge about the program (3% vs. 50%; $\chi^2 = 76.40$, $p < .01$) were observed in programs that met during school. Nevertheless, there was no significant difference in reports of challenges due to lack of referrals based on meeting time (28% in programs that met during school vs. 24% in programs that met after school or during lunch, $\chi^2 = 0.44$, $p = .51$).

4. Discussion

Although preliminary, the results of this study suggest that, among academically at-risk youth, the impact of school-based mentoring on academic outcomes is moderated by the time of day that matches meet. Specifically, academically vulnerable youth derived significant academic benefits from mentoring in programs that met after school or during lunch. In programs that met during school, excluding lunch, there was no evidence of academic benefits for academically vulnerable youth, and some evidence of negative effects.

There were several differences in characteristics of programs that met during school versus those that met after school or during lunch. These differences suggest the possibility that differences in impacts were due to underlying differences between programs and schools, as

opposed to meeting time, per se. For example, programs that were implemented after school or during lunch may have simply been stronger programs. Surprisingly, however, programs that met during the school day had generally been implemented in the school for a greater number of years, indicating a greater degree of establishment and stability. It is also possible that the differences in impacts observed based on meeting time were due to differences in the schools that house the programs. For example, one might wonder whether schools that offered the intervention after school had greater resources than those that offered it during the school day. In fact, the opposite was true, with schools where programs met during the school day reporting a smaller percentage of students on free and reduced-price lunch and a greater proportion of students in out-of-school-time programs, indicating greater resources.

Differences in the amount of time matches spent together and how they used that time also may have accounted for differences in impacts. Specifically, staff report indicated that, among programs meeting after school or during lunch, match meetings tended to last for a longer period of time, and matches were more likely to spend time engaged in academic activities and to have a case manager present during their meetings. It is possible that these differences contributed to the differential impacts observed. Nevertheless, the difference between duration of meetings was not large, with programs that met during the school day tending to meet for approximately 46 to 60 minutes, while after school meetings tended to last a little over an hour (Herrera et al., 2007). Moreover, although spending a greater amount of time on academic activities in after-school programs may have contributed to academic gains, other research on mentoring suggests that relationship-focused activities and discussions are associated with greater benefits to youth and greater levels of mentor satisfaction than more goal-oriented or academically-focused activities (Karcher, 2007; Karcher, 2008b). Additionally, even programs

that met after school and during lunch reported spending less than half of match time on academics.

In an effort to further explore whether the differences in impacts based on meeting time were actually driven by these underlying differences between programs, we conducted our regression analyses testing for interaction effects a second time, including program- and school-level variables as covariates where differences were observed based on meeting time. Although the strength of effects was reduced (likely in part due to the inclusion of 14 covariates), trends remained in the same direction for all variables, and significant or marginally significant interaction effects were observed for math and reading. This suggests that differences observed in impacts by meeting time were not due solely to underlying differences in program, school or match characteristics.

4.1 Mentoring During School

Unfortunately, because we have limited knowledge of the details of the implementation of programs that offered mentoring during school, we can only speculate as to why negative outcomes were observed. Nonetheless, it is likely that match meetings in these programs involved missing class instruction, activities, and assignments. In fact, 39% of participants in programs meeting during the school day had case managers who reported that teachers did not allow students to attend the program consistently, and 28% were in programs in which the case manager reported conflicts with teachers over the goals of the program. This suggests that a substantial number of teachers viewed pulling students out of school activities to attend mentoring as problematic. Teachers' attitudes toward mentoring are particularly important in light of previous research indicating that teacher helpfulness and teacher communication with

mentors in SBM programs are associated with mentors' perceptions of closeness with their mentee (Herrera et al., 2007).

The challenges associated with SBM programs meeting during the school day are consistent with other research on the challenges of pullout programs (e.g., Brandts, 2005; Glass & Smith, 1977; Rea, McLaughlin, & Walther-Thomas, 2002). Missing class time may be a particularly difficult for students who are already academically at-risk. Whereas stronger students may easily catch up on instruction they missed, students who already struggle academically might find this more challenging. Moreover, since supplemental education and counseling are often provided as pullout programs, it is also possible that there are stigmas attached to being pulled from regular school activities to meet with a mentor. For youth who already feel insecure about their academic abilities, this may cause them to further disengage. Likewise, pulling youth from regular school activities may inadvertently send students the message that school activities are of secondary importance.

Of course, there may also be some benefits to meeting during the school day. Specifically, such programs might reach youth who may not be able or willing to stay at school for after-school programs. They also may provide access to volunteers who are unable to meet later in the day. In addition, case managers in programs that met after school reported a lack of teacher knowledge of the program as a challenge, whereas this was not the case in programs that met during the school day (although there was no difference in reports of a lack of referrals across the two program types). Moreover, this study focused exclusively on academic impacts, and it is possible that programs that meet during school may be more effective at addressing social or emotional challenges. Nonetheless, the findings from this study caution that it is important to weigh these benefits against potential unanticipated negative effects. One approach

that may be able to take advantage of these benefits while avoiding pulling students from school activities is offered by RALLY, a program that provides mentoring and tutoring during the school day, but instead of pulling students out of class, assigns a "prevention practitioner" to a full class who works with students in the classroom, as well as meeting with students in small groups during lunch (Malti, Schwartz, Liu, & Noam, 2008; Schwartz & Petersen, 2008).

4.3 Mentoring After School or During Lunch

This study also highlights the benefits of participating in SBM programs during extracurricular time such as after school and during lunch. In fact, literature from outside the mentoring field points to the benefits of after-school programming that provides students with opportunities for safe and constructive activities (e.g., Miller, 2003), which can reinforce the learning that takes place in school (Mahoney, Parente, & Zigler, 2010). In addition to providing youth with a caring adult relationship, after-school SBM programs allow youth to engage in positive, constructive activities after school when they otherwise might have nothing else to do. This may be especially beneficial to youth from lower socio-economic backgrounds who are less likely to have access to high-quality after-school opportunities (Duffett & Johnson, 2004; Little, 2007). There is also some research to support the efficacy of mentoring during school lunch, such as "Lunch Buddy" mentoring for bullied children (Elledge, Cavell, Ogle, & Newgent, 2010). These programs may work, in part, by providing youth with a partner whom other youth admire, helping to redress social difficulties. In light of the small number of programs employing lunch mentoring, the current study did not investigate mentoring during lunch separately from after-school mentoring. Future studies are recommended based on the present encouraging findings about SBM that occurs during extracurricular time.

4.3 Implications for Research and Practice

This study demonstrates the importance of investigating variation within SBM, a relatively new form of mentoring that is still undergoing refinement (Herrera et al., 2011). While previous studies have explored how youth, mentor, and relationship characteristics influence SBM's effectiveness (e.g., Grossman et al., 2012; Karcher, 2008a; Karcher et al., 2010; Schwartz et al., 2011), it is also important to examine how structural characteristics of programs and the context in which programs are implemented may influence effectiveness. The results of this study suggest that SBM can be an effective strategy to foster academic achievement. It is a noteworthy achievement that, when offered after school or during lunch, the intervention led to significant improvement, with effect sizes of .2 and greater, on a number of academic outcomes for youth who were academically at-risk at baseline. The improvement in reading is particularly promising in light of the significant role elementary and middle school reading ability plays in predicting future academic outcomes (Lesnick et al., 2010).

This study also has implications for school-based programs in general. In the context of government and community efforts to locate health and social services within schools (Levy & Shepardson, 1992; Sanders, 2006) and increasing numbers of school-based programs (Dryfoos, 1999), it is important to consider how the timing of such programs may influence outcomes. Results of this study suggest that well-intentioned programs providing valuable services may be compromising their effects by meeting during school. Meeting at other times such as after school or during lunch could allow programs to supplement and support the learning occurring during the school day instead of causing students to miss out on school activities and, in some cases, instructional time, which students may then struggle to make up.

4.4 Limitations and Directions for Future Research

Although this study has several strengths, including longitudinal data from multiple sources and a large, national sample that enabled comparisons across programs, there also are limitations that should be noted. Most importantly, although our analyses revealed significant associations between the time of day mentoring was offered and mentoring impacts, it is possible that these associations result from underlying differences in the schools in which the programs were implemented or the youth attending these programs that were not captured in our surveys. Experimental studies in which participants are randomly assigned to mentoring at different times of day (during school, during lunch, and after school) are recommended to further investigate the influence of meeting time on youth academic outcomes. In addition, more in-depth information about program implementation and, in particular, more precise information about when mentoring occurred in programs that met during school but not during lunch, would have helped to illuminate the findings. Furthermore, although the use of more than one source of data to measure outcomes is a strength of the study, the inclusion of teacher reports could be problematic, particularly if teachers knew which students were receiving mentoring and biased their responses in favor of them. Herrera et al., (2011) investigated this possibility, however, and found no evidence that teachers systematically inflated their assessments of youth as a function of their group status. Finally, because mentors were all situated within the context of a single youth mentoring organization (BBBS), this pattern of findings may not apply as well to mentoring interventions that provide volunteers with less training and supervision than is typical of BBBS.

Despite these limitations, this study calls attention to the role that meeting time may play in moderating the impacts of SBM. Although additional research is indicated, the findings

highlight the need for caution in structuring mentoring and other youth development programs in ways that may interfere with other school activities.

References

Aksoy, T. & Link, C. R. (2000). A panel analysis of student mathematics achievement in the US in the 1990s: does increasing the amount of time in learning activities affect math achievement?. *Economics of Education Review, 19*, 261-277.

Archambault, I., Eccles, J. S., & Vida, M. N. (2010). Ability self-concepts and subjective value in literacy: Joint trajectories from grades 1 through 12. *Journal of Educational Psychology, 102*, 804-816.

Bernstein, L., Dun Rappaport, C., Olsho, L., Hunt D. & Levin, M. (2009). *Impact evaluation of the U.S. Department of Education's Student Mentoring Program: Final report.* Institute of Education Sciences, NCEE 2009-4047.

Brandts, L. (2005). "Are pullout programs sabotaging classroom community in our elementary schools?" In T. Hatch et al. (Ed), *Going public with our teaching: An anthology of practice*. New York: Teachers College Press.

Brown, B. B., Clasen, D. R., & Eicher, S. A. (1986). Perceptions of peer pressure, peer conformity dispositions, and self-reported behavior among adolescents. *Developmental Psychology, 22*, 521–530.

Brown, B. W., & Saks, D. H. (1986). Measuring the effects of instructional time on student learning: Evidence from the Beginning Teacher Evaluation Study. *American Journal of Education, 94*, 480-500.

Diversi, M., & Mecham, C. (2005). Latino(a) students and Caucasian mentors in a rural after-school program: Towards empowering adult-youth relationships. *Journal of Community Psychology 33*, 31-40.

Dryfoos, J. G. (1999). The role of the school in children's out-of-school time. *The Future of Children, 9*, 117-134.

DuBois, D.L., Portillo, N., Rhodes, J.E., Silverthorn, N., & Valentine, J.C. (2011). How effective are mentoring programs for youth? A systematic assessment of the evidence. *Psychological Science in the Public Interest, 12*, 57-91.

Duffett, A. & Johnson, J. (2004). *All work and no play?*. New York City, NY: Public Agenda.

Elledge, L. C., Cavell, T. A., Ogle, N., & Newgent, R. A. (2010). Lunch buddy mentoring as selective prevention for bullied children. *Journal of Primary Prevention, 31,* 171-187.

Finn, J. D. (1989). Withdrawing from school. *Review of Educational Research, 59*, 117–142.

Fredrick, W. C. & Walberg, H. J. (1980). Learning as a Function of Time. *The Journal of Educational Research, 73*, 183-194.

Glass, G. V. & Smith, M. L. (1977). *Pull-out in compensatory education*. Washington, DC: Department of Health, Education, & Welfare.

Grossman, J. B., Chan, C., Schwartz, S. E. O., & Rhodes, J. E. (2012). The test of time in school-based mentoring: The role of relationship duration and re-matching on academic outcomes. *American Journal of Community Psychology, 49*, 43-54.

Grossman, J. B., & Rhodes, J. E. (2002). The test of time: Predictors and effects of duration in youth mentoring programs. *American Journal of Community Psychology, 30*, 199-206.

Harter, S. (1985). *Manual for the Self-Perception Profile for Children.* Denver, CO: University of Denver.

Helmke, A., & van Aken, M. A. G., (1995). The causal ordering of academic achievement and self-concept of ability during elementary school: A longitudinal study. *Journal of Educational Psychology, 87,* 624-637.

Herrera, C. (2004). *School-based mentoring: A closer look.* Philadelphia, PA: Public/Private Ventures.

Herrera, C., Grossman, J. B., Kauh, T. J., Feldman, A. F., & McMaken, J. (with Jucovy, L. Z.). (2007). *Making a difference in schools: The Big Brothers Big Sisters school-based mentoring impact study.* Philadelphia, PA: Public/Private Ventures.

Herrera, C., Grossman, J. B., Kauh, T. J., & McMaken, J. (2011). Mentoring in schools: An impact study of Big Brothers Big Sisters school-based mentoring. *Child Development, 82,* 346-361.

Holmes, T., & Rahe, R. (1967). The Social Readjustment Rating Scale. *Journal of Psychosomatic Reasoning, 11*, 213-218.

Huang, C. (2011). Self-concept and academic achievement: A meta-analysis of longitudinal relations. *Journal of School Psychology*, doi: 10.101/j.jsp.2011.07.001.

Jenkins, J. R., & Heinen, A. (1989). Students' preferences for service delivery: pull-out, in-class, or integrated models. *Exceptional Children, 55*, 516-523.

Johnston, P., Allington, R., & Afflerbach, P. (1985). The congruence of classroom and remedial instruction. *Elementary School Journal, 85*, 465-477.

Jucovy, L. (2002). *Measuring the Quality of Mentor-Youth Relationships: A Tool for Mentoring Programs.* Philadelphia, PA: Public/Private Ventures.

Karcher, M. J. (2008). The Study of Mentoring in the Learning Environment (SMILE): A randomized study of the effectiveness of school-based mentoring. *Prevention Science*, *9*, 99-113.

Karcher, M. J. (January 17, 2008). "No fooling around:" The role of play, activities, and pressure to succeed academically in SBM outcomes. 2008 Maryland Mentoring Conference,

Maryland Mentoring Partnership. Baltimore, MD: Sheraton Baltimore City Center Hotel. Retrieved from August 19, 2011 from http://utsasmile.org/findings.php.

Karcher, M. J. (February 28, 2007). The importance of match activities on mentoring relationships. National teleconference conducted by the Mentoring Resource Center. Portland, OR: *Northwest Regional Educational Laboratory.*

Karcher, M., Davidson, A., Rhodes, J. E., Herrera, C. (2010). Pygmalion in the mentoring program: The role of peer mentors' attitudes in shaping mentee outcomes. *Applied Developmental Science, 14*, 212-227.

Laird, R. D., Jordan, K. Y., Dodge, K. A., Pettit, G. S., & Bates, J. E. (2001). Peer rejection in childhood, involvement with antisocial peers in early adolescence, and the development of externalizing behavior problems. *Development and Psychopathology, 13*, 337–354.

Lesnick, J., Goerge, R. M., Smithgall, C., & Gwynne, J. (2010). *Reading on grade level in third grade: How is it related to high school performance and college enrollment*. Chicago: Chapin Hall at the University of Chicago.

Levy, J. E., & Shepardson, W. (1992). A look at the current school-linked service efforts. *The Future of Children, 2*, 44-55.

Little, P. (2007). *Access to afterschool programs: Overcoming the barriers to getting youth "in the door"*. Commissioned by Massachusetts Special Commission on After School and Out of School Time. Retrieved August 31, 2011 from massafterschoolcomm.org/.

Mahoney, J. L., Parente, M. E., & Zigler, E. F. (2010). After-school program participation and children's development. In J. Meece & J. S. Eccles (Eds.), *Handbook of research on schools, schooling, and human development* (pp. 379-397). New York, NY: Routledge.

Malti, T., Schwartz, S. E. O., Liu, C. H., & Noam, G. G. (2008). Program evaluation:

Relationships as key to student development. *New Directions for Youth Development, 120*, 151-178.

MENTOR/National Mentoring Partnership (2006). *Mentoring in America 2005: A snapshot of the current* s*tate of mentoring.* Alexandria, VA: Author.

Miller, B. (2003). *Critical Hours: Afterschool Programs and Educational Success*. Quincy, MA: Nellie Mae Educational Foundation. Retrieved August 19, 2011 from www.nmefdn.org/uploads/Critical_hours_Full.pdf.

Parra, G. R., DuBois, D. L., Neville, H. A., Pugh-Lilly, A. O., & Povinelli, N. (2002). Mentoring relationships for youth: Investigation of a process-oriented model. *Journal of Community Psychology, 30,* 367-388.

Pierce, K. M., Hamm, J. V., & Vandell, D. L. (1999). Experiences in after-school programs and children's adjustment in first-grade classrooms. *Child Development*, *70*, 756-767.

Piluski, J. (1994). Preventing reading failure: A review of five effective programs. *The Reading Teacher, 48*, 30-39.

Portwood, S. G., & Ayers, P. M. (2005). Schools. In D. L. DuBois & M. J. Karcher (eds.), *Handbook of youth mentoring.* Thousand Oaks, CA: Sage.

Portwood, S. G., Ayers, P. M., Kinnison, K. E., Waris, R. G., & Wise, D. L. (2005). YouthFriends: Outcomes from a school-based mentoring program. *Journal of Primary Prevention Special Issue: Mentoring with Children and Youth, 26,* 129-145.

Radziszewska, B., & Rogoff, B. (1991). Children's guided participation in planning imaginary errands with skilled adult or peer partners. *Developmental Psychology*, *27*, 381-389.

Rea, P. J., McLaughlin, V. L., & Walther-Thomas, C. (2002). Outcomes for students with learning disabilities in inclusive and pullout programs. *Exceptional Children, 68*, 203-222.

Rhodes, J. E. (2005). A model of youth mentoring. In D. L. DuBois & M. J. Karcher (Eds.), *Handbook of youth mentoring* (pp. 30-43). Thousand Oaks, CA: Sage.

Rhodes, J. E., & Lowe, S. R. (2009). Mentoring in adolescence. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (Vol. 2, pp. 152-190). Hoboken, NJ: Wiley.

Sanders, M. G. (2006). *Building school-community partnerships: Collaboration for student success*. Thousand Oaks, CA: Corwin Press.

Schwartz, S. E. O., & Petersen, S. B. (2008). A new developmentalist role: Connecting youth development, mental health, and education. *New Directions for Youth Development, 120*, 57-78.

Schwartz, S. E. O., Rhodes, J. E., Chan, C., & Herrera, C. (2011). The impact of school-based mentoring on youth with different relational profiles. *Developmental Psychology, 47,* 450-462.

Thompson, L. A. & Kelly-Vance, L. (2001). The impact of mentoring on academic achievement of at-risk youth. *Children and Youth Services Review, 23*, 227-242.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge: Harvard University Press.

Wheeler, M. E., Keller, T. E., & Dubois, D. L. (2010). Review of three recent randomized trials of school-based mentoring. *Social Policy Report, 24*, 1-21.

Table 1. Youth Baseline Characteristics by Meeting Time (Treatment Group Only)

	After School/Lunch (N = 279)	During School (N = 137)	Significance
Girls	147 (53%)	68 (50%)	$\chi^2 = 0.34$
Minority Status	196 (70%)	61 (45%)	$\chi^2 = 25.75$**
Free/Reduced Lunch	170 (70%)	67 (58%)	$\chi^2 = 4.96$*
Mean Grade Level in School	5.09 (1.07)	5.03 (1.07)	$F = 0.26$

*$p < .05$, **$p < .01$.

Table 2. Impacts of Mentoring by Meeting Time for Academically At-Risk Youth

Outcome	After School/Lunch (N = 239)				During School (N = 120)				Interaction Effect (N = 359)			
	B	SE	95% CI	ES	B	SE	95% CI	ES	B	SE	95% CI	ES
Acad. Achievement	.19‡	.11	-.02, .40	.22	-.09	.16	-.39, .22	.12	-.33‡	.18	-.69, .04	.40
Math	.18	.12	-.06, .24	.21	-.42**	.16	-.72, -.11	.58	-.60**	.21	-1.00, -.19	.72
Science	.14	.11	-.07, .36	.15	-.19	.19	-.56, .19	.21	-.36‡	.21	-.77, .06	.40
Social Studies	.11	.12	-.12, .34	.12	-.16	.18	-.51, .19	.18	-.29	.20	-.69, .10	.32
Reading	.27*	.12	.04, .49	.29	-.02	.22	-.47, .41	.02	-.32	.20	-.70, .07	.35
Language	.21*	.09	.03, .39	.28	-.05	.14	-.32, .22	.07	-.33*	.16	-.65, -.01	.43
Grades	.20	.28	-.35, .75	.09	-.15	.39	-.92, .62	.08	-.51	.48	-1.45, .44	.24
SPAA	.12	.08	-.04, .27	.19	.13	.11	-.09, .34	.21	.03	.13	-.07, .22	.05
Unexcused Absence	-.35	.22	-.78, .08	.20	-.08	.21	-.59, .34	.08	.21	.35	-.47, .90	.14

Note. ES=Effect size. SPAA = Self-Perceptions of Academic Abilities.

‡$p < .10$, *$p < .05$, **$p < .01$.

Table 3. Mean Outcome Variables at Baseline and Follow-Up by Meeting Time among Academically At-Risk Youth

Outcome	Control Group (N = 177)		Treatment Group (During School) (N = 68)		Treatment Group (Afterschool/Lunch) (N = 114)	
	Baseline Mean (SD)[1]	Follow-Up Mean (SD)	Baseline Mean (SD)[1]	Follow-Up Mean (SD)	Baseline Mean (SD)[1]	Follow-Up Mean (SD)
Acad. Achievement	1.56 (.50)	1.80 (.84)	1.63 (.49)	1.80 (.73)	1.63 (.49)	2.04 (.82)
Math	1.60 (.66)	1.74 (.80)	1.54 (.66)	1.51 (.71)	1.69 (.70)	2.00 (.88)
Science	1.93 (.75)	1.99 (.92)	2.04 (.72)	2.06 (.84)	1.84 (.76)	2.19 (.90)
Social Studies	1.82 (.70)	2.01 (.90)	2.02 (.68)	2.05 (.87)	1.83 (.73)	2.21 (.93)
Reading	1.55 (.68)	1.71 (.86)	1.59 (.74)	1.76 (.88)	1.64 (.79)	2.00 (.97)
Language	1.85 (.64)	1.98 (.76)	1.89 (.67)	2.02 (.74)	1.96 (.69)	2.23 (.73)
Grades	5.13 (2.11)	4.82 (2.14)	5.22 (2.02)	4.95 (2.07)	5.20 (2.09)	4.98 (2.18)
SPAA	2.66 (.61)	2.57 (.63)	2.69 (.67)	2.71 (.60)	2.68 (.59)	2.68 (.60)
Unexcused Absence	0.42 (1.00)	0.73 (1.79)	0.42 (1.38)	0.29 (.83)	0.57 (2.27)	0.42 (1.46)

Note: SPAA = Self-Perceptions of Academic Abilities.

[1]No significant differences were observed between baseline measurements of outcome variables across the three groupings.