CHANGING EXPECTATIONS: THE IMPACTS OF MENTORING AT-RISK YOUTH ON COLLEGE AGED MENTORS

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ABSTRACT

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Research on youth mentoring overwhelmingly suggests that at-risk youth benefit from having mentors to guide them through their academic and personal lives. School-based mentoring (SBM) is a common practice which often utilizes adult mentors to work with youth with positive effects being consistently documented among adults who choose to mentor. The College Ambition Program (CAP) is a multi-component intervention model currently being implemented in two urban and two rural mid-Michigan schools. As part of the CAP intervention, college mentors are recruited to work with students by taking on a dual role as traditional tutor and academic mentor, with the ultimate goal of guiding students who would not ordinarily consider college, or who are misaligned in their academic abilities with a college or university of their proposed choice. Data are collected through a number of instruments with mentors documenting their experiences with students in real-time and retrospectively. The overarching objective of this thesis is to analyze how the mentors' expectations of themselves and their students evolved over the course of their term with the College Ambition Program. Preliminary analyses of these data show that younger mentors are reporting an increased awareness of themselves and a better understanding of urban youth and their academic environment. Through a deeper analysis of the mentor data, this research aims to explicate the impact of at-risk youth mentoring on collegeaged mentors and the importance of having mentoring opportunities available for young-adults.

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INTRODUCTION: THE COLLEGE AMBITION PROGRAM

The College Ambition Program (CAP) is a multi-component intervention model currently being implemented in two urban and two rural mid-Michigan schools, and tested in four other matched control schools. The objective of this program is to assist students who attend high schools with traditionally low college-going rates in understanding and successfully navigating the college-going process by identifying the components that are most likely to influence and aid a student in enrolling at a post-secondary institution.

The CAP intervention has four unique components that work together in creating a college-going culture: Mentoring/Tutoring; Financial Aid Guidance; Course Counseling and Advising; and College Visits and Activities. All students in a school are allowed to participate in CAP activities unless a parent or guardian has opted them out of the program. Unlike other SBM programs, CAP takes a whole-school approach in achieving this vision, working with parents, teachers, administrators, and students in order to change the college-going culture in the high schools. Moreover, in understanding the importance of supporting and not supplanting a school's underlying culture and basic operational needs, CAP also works to mold the program intervention to address the needs of the individual school in the hopes that a tailored intervention model will lead to a more cooperative, trusting, and successful relationship between CAP and the schools.

A Different Mentoring Model

Research on youth mentoring overwhelmingly suggests that at-risk youth benefit from having mentors to guide them through their academic and personal lives. Both school- and community-based mentoring programs (SBM and CBM respectively), have proliferated over the years, often utilizing adult mentors to work with these youth. As part of the mentoring

component of the intervention, the College Ambition Program has taken traditional school-based mentoring, where one student is assigned to one mentor, and re-casted the model using bestpractices to address the needs of both the mentors and the student population that CAP serves. Rather, the CAP mentoring model utilizes a collective or "team-based" (Sipe 2005) approach to not only accommodate the logistics of enlisting the help of college mentors with course schedules that may not lend to consistent mentoring meetings, but to also ensure that the high school students are being exposed to as many different types of college students and academic skill-sets as possible. The team-based approach has also been reportedly beneficial for many of the CAP mentors who have been paired with students needing tutoring on course work that does not align with their own academic abilities (e.g., AP Physics). By fostering a decidedly community-based atmosphere, both the mentors and the mentees in the CAP Centers have been reported to reach out to one another in order to accomplish the shared goals of academic competence and personal success.

Mentoring with CAP and Changing Expectations

CAP recruits students from a local university to mentor in the schools and work with high school students in their designated CAP Center, usually a repurposed classroom equipped with college brochures, financial aid information, and study guides. The university students are required to attend a two-hour training session where they are taught how to engage with their mentees as both a traditional tutor and as an academic mentor with the explicit goal of talking about college and helping the students understand what post-secondary education can offer them. During their tenure with CAP, the mentors are asked to document and reflect on their sessions, as well as complete one mid- and one post-semester survey which asks them to examine in greater detail their mentorship over the course of the previous 10 to 15 weeks. A preliminary analysis of

the mentors' contact logs, mid-semester feedback polls, and exit surveys showed that many mentors reported experiencing changes in their personal potential (i.e., their ability or confidence in teaching adolescents, their overall confidence in their own academic and interpersonal skills, or an adjustment or affirmation in their career expectations), as well changes in their expectations of the students that they mentored (i.e., noticeable changes in their mentees' confidence, changes in their mentees' abilities to successfully complete their school work, or changes in their own perceptions of adolescents in general). Through a more thorough analysis of the mentor data, this study will explicate the impact of at-risk youth mentoring on collegeaged mentors in the College Ambition Program, as well as discuss its implications for service learning opportunities available for young-adults.

LITERATURE

Mentoring: A Definition

The words "mentor" and "mentoring" can invoke a handful of different interpretations, and to be sure, while mentoring is usually described as being a strong relationship between two people, with one more experienced than the other, there is no shortage in nuanced characterizations of either the mentor or the services a mentor provides. The <u>Handbook of Youth Mentoring</u> (DuBois and Karcher 2005) is a 560 paged volume dedicated to analyzing the variations and relative successes and failures of mentoring programs, and speaks to the complexity of a widespread social activity that once seemed straightforward. While the breadth and depth of the handbook nearly prohibits the editors from providing one overarching definition of mentors and mentoring, three recurring themes that connect all of the interpretations were identified: mentors possess greater experience than their mentees; mentors provide guidance "intended to facilitate the growth and development of the mentee"; and, there is an "emotional bond" between the mentor and the mentee (Dubois and Karcher 2005: 3).

More specific to this research however, is the definition put forth by Urie Bronfenbrenner, a leading scholar in the field of developmental psychology, who defined a mentor as "an older, more experienced person who seeks to further the development of character and competence in a younger person by guiding the latter in acquiring the mastery of progressively more complex skills and tasks in which the mentor is already proficient," and that during the course of the mentor-mentee relationship, both people ultimately and ideally forge a "special bond of mutual commitment" (Darling, 2005:179) While this definition can prove to be problematic depending on context, it essentially suits the purposes of the College Ambition Program which recruits college students for the role of the more experienced and proficient "adult," specifically in regards to navigating the college-going process. Where CAP diverges from this definition however, is in the designation of the term "adult" in the mentor-mentee relationship. Instead, the CAP mentoring model takes advantage of the "cross-aged" definition proposed by Michael Karcher (2005a: 267), which acknowledges that college students are not necessarily viewed as adults (Settersten and Ray, 2010), yet they still possess advanced academic knowledge and life experiences not yet acquired by their mentees. The cross-aged terminology is used to differentiate between this approach from the more familiar peer-to-peer model, which indicates a greater equality between the two people involved in the mentoring relationship, despite the understanding that one peer is more knowledgeable about a particular area of interest than the other (Karcher, 2005b).

Taking all of this into account, CAP has determined its mentoring model to follow that of Karcher's cross-aged categorization while adhering to the mentor definition from Bronfenbrenner, as CAP mentors aim to help their mentees master both academic, personal, and professional skills that are particularly related to the college-going process.

The Benefits of Mentoring

While not completely unequivocal in their level of successes (McPartland and Nettles, 1991; Slicker and Palmer, 1993), both school-based mentoring (SBM) and community-based mentoring (CBM) programs have had positive impacts on student outcomes through improvements and increases in academic performance, relationships with peers and other adults, school connectedness and competence in classes. These programs have also led to decreases in fighting, school absences and tardiness, and lower levels of substance abuse. This is especially true when the mentoring relationship is consistent and ongoing (Karcher, 2005b; Diversi and Mecham, 2005; Holt, Bry, and Johnson, 2008; Portwood, Ayers, Kinnison, Waris, and Wise, 2005; Rhodes, Grossman, and Resch, 2000; Rhodes, Reddy, Roffman, and Grossman, 2005; Tierney, Grossman, and Resch, 1995). Studies of formal youth mentoring programs that specifically focus on college access and matriculation for at-risk youth have also been shown to have positive results, with students showing similar improvements in their relationships with peers and other adults, grade promotion, and an increased motivation to achieve academic goals (Rhodes, Grossman, and Resch, 2000). In addition to the well documented positive effects of mentoring for at-risk youth on immediate behavior and academic performance, research suggests that when mentors who have attended college discuss their experiences with their mentees, their interest in post-secondary education grows, particularly among students who come from families or from social networks with little or no college experience (DuBouis, Holloway, Valentine, and Cooper, 2002). This finding is particularly relevant for this study where college matriculation is the outcome measure of the College Ambition Program intervention.

The Debates on Mentoring Programs

While there is an undeniably large body of literature which suggests that mentoring is a positive and beneficial activity, there is also conflicting research which suggests otherwise, asserting that mentoring programs elicit only modest improvements in youth behavior (Dubois, Holloway, Valentine, and Cooper 2002), and that empirical studies have only shown "indirect evidence" (Thomson and Zand, 2009: 436) that mentoring has a positive effect on youth. Other research on short-term mentoring for adolescents (less than a year), has actually been found to be "associated with decreases in self-worth and in perceptions of scholastic competence" (Spencer 2006: 288; Rhodes and Dubois, 2008: 255). Other critiques of mentoring programs center on the relatively modest and short-lived improvements in student achievement (Bernstein et al., 2009; Rhodes and Dubois, 2008). In fact, of the few studies that collected follow-up data, the beneficial effects of the mentoring programs in questions were very weak, "suggesting an eroding of

benefits after youth left programs and relationships with mentors ended" (Rhodes and Dubois, 2008: 255). To be sure, the variations of mentoring programs and the unique models of mentoring (e.g., peer-to-peer, SBM, CBM, natural mentoring), allow for a number of potential pitfalls to manifest themselves in the mentoring process. It should be noted however that the length of time that mentors spend with their mentees has been one of the key variables that have consistently shown in the research to impact the relative success or failures of these relationships.

Mentoring at the Psychological Level: Role and Identity Development

The notion of the "looking glass self" (Cooley 1902: 198-199) is paramount to any mentoring program. The idea that a person's opinion of themselves is shaped by the interpersonal interactions and perceptions of those that surround them, is a major contributor to the mentoring models that are operational today. Without the assumption that the interactions that children and adolescents have with others have an effect on personal behavior, mentoring programs as we know them would simply not exist. These programs operate on the premise that, ideally, by internalizing the positive appraisals that the mentor imparts upon the mentee, the mentee would modify their internal perceptions of self to reflect this new opinion, and that positive change would manifest itself in their academic and personal life. Indeed, it can be argued that the relative success of failure of the mentoring relationship is contingent on the ability of the mentor to explicitly provide this type of interaction with their mentee.

A similar theory of "proposed selves," first proposed by Markus and Nurius in 1986, advances the idea of the looking glass self, and introduces importance of role modeling in informing a youth's current decisions and behaviors (Rhodes 2005). The possible self can be described as "individuals' ideas of what they might become, what they would like to become,

and what they fear becoming" (Rhodes 2005: 35). Situating mentoring programs to serve students that lack positive role models has become one way of counteracting a negative possible self. Indeed, much like CAP, many mentoring programs are very strategic in who is recruited to mentor for this very reason.

While the looking-glass self and proposed self are mainly focused on the benefits gained by the mentee in this relationship, it is not a huge jump in logic to suggest the identity and role development of the mentor is also effected by working with their mentee, particularly for younger mentors whose identities are still in the process of being solidified (Batchelder and Roote, 1994). The effects of the mentor-mentee relationship on the mentors has also been well documented, though arguably less so for younger mentors (those 18-30) than for adult mentors who volunteer to work with at-risk youth, or those who mentor apprentices in work-related programs, and is usually done so under the guise of "service learning" requirements. Nevertheless, it is assumed that the young adults involved in these types of relationships get some sort of intrinsic gratification out of the exchange, or the programs would fail. Literature on the benefits of mentoring for mentors has overwhelmingly shown that mentors gain a deeper acknowledgement and appreciation of their expertise as well as the further development of leadership skills (Wollman-Bonilla, 1997; Tsang, 1999), which is often tied to an increase in self-esteem, greater social insight, and improved social and interpersonal skills (Gaston and Jackson, 1998; Good, Halpin, and Halpin, 1998; Tsang 1999).

Lastly, the opportunity for reflective thought might be one of the greatest benefits to college mentors (Tsang, 1999; Sax and Astin, 1997). Over the past few decades "service learning" opportunities have proliferated across college campuses, offering students volunteer opportunities that align with their areas of study. Service learning has been defined as "a form of

experiential education in which students engaged in activities that address human and community needs together with structured opportunities intentionally designed to promote student learning and development" and that "reflection and reciprocity are key concepts of service-learning" (Jacoby and Associates, 1996: 5). A study conducted by Sax and Astin (1997) supports these statements. Their data, which included 2,309 service participants and 1,141 nonparticipants, showed that those who participated in service learning opportunities expressed a stronger commitment to serving their community, better academic performance, stronger connectivity with their subject matter, and a greater understanding of community issues (Sax and Astin, 1997). Preliminary analysis of CAP mentor data has indeed shown similar responses by participants in these areas which are consistent with the literature, with a number of mentors reporting changes in their own academic proficiency, as well as changes in personal ambitions, in addition to altered perceptions of their mentee's academic capabilities.

The Social Benefits of Mentoring: Building Social Capital

The College Ambition Program has positioned itself in high schools that have lower than average college-going rates, thus, the probability of CAP mentors encountering students who do not have parents, siblings, or peers in their social networks who have gone to college is likely. The lack of a college-going culture in these schools and communities is paramount to the CAP model and the reasoning behind the utilization of college mentors. CAP has recruited mentors from specific academic departments and student groups with the aim of supporting students' academic and personal needs, as well as providing the students with an accessible role model. It has been recognized that young adult mentors may be ideal role models for at-risk youth in demonstrating what a successful transition to adulthood looks like (Zarret and Eccles, 2006). Additionally, studies have shown that students who come from low-SES households are less

likely to have the academic and familial support necessary for enrollment in post-secondary education (Sanchez, Reyes, and Singh, 2006), and therefore face additional challenges with the transition to college than many of their peers. Those who come from homes where parents did not attend college are much more limited in the academic guidance and encouragement needed to successfully complete this process (Karcher, 2008). In addition to the deficiencies in these students' access and knowledge of post-secondary education, they often attend high schools with few guidance resources, or an overburdened staff (McClafferty, McDonough, Nunez, 2002). Based on the recognition that the mentees may be lacking in social and cultural capital, CAP strategically recruited college students who would be able to discuss their personal experiences with college and guide their mentees using first-hand knowledge of the college-going process.

The Intellectual Benefits of Mentoring

Given that the Bureau of Labor Statistics estimated that science and technology jobs would increase by 26 percent (compared to 15 percent for all occupations) from 2002 to 2012 with computer science and mathematics careers alone projected to increase by 39 percent (Ohio STEM Learning Network, 2011), the CAP study acknowledges that mentees can benefit from increased exposure to college students who are currently studying STEM related majors. Research has shown that "the use of role models has also been proposed as a potentially powerful technique to influence more talented young women to choose to pursue science-related careers" (Smith and Erb, 1986 : 667), and that mentors who participated in service learning opportunities "gain[ed] the skills necessary for lifelong learning ...in a manner cognizant of professional and civic responsibilities" (Tsang, 1999:2). In order to promote STEM-related careers, CAP has partnered with the local university physics and cyclotron departments through the campus service learning office, as well as with a graduate student run group that promotes

women in science. CAP has made a concerted effort to recruit students taking STEM courses, such as those who are pre-med and those who are considering teaching or education as a career, in order to give the high school students mentors with a solid skill-set and a genuine interest in mentoring youth.

Mentoring Training

The College Ambition Program intervention has created a mentoring model built on what has been well documented in the literature and the research about youth mentoring, yet CAP also acknowledges where other school-based youth mentoring programs are lacking, and has thus modified its model to fill in some of those voids and mold its mentoring program to the specific needs of the school.

The literature is unequivocal in its emphasis on the importance of initial and ongoing training and support for mentors, particularly for cross-race matches (Dubois, et al., 2006; Herrera et al., 2007; Karcher, 2008; Sipe, 2002). As such, CAP has developed an initial training session for all new mentees that discusses the developmental issues related to the population being served (e.g., at-risk youth, the working poor, white privilege, immigration) (Diversi and Mecham, 2005; Hughes and Dykstra, 2008; Langhout et al., 2004; Sipe, 2002). This type of sociological understanding of the mentee population, which was presented to the new mentors during their training in addition to the more traditional instruction on mentoring, is important in enabling the mentors to develop realistic expectations of what they can accomplish, as inflated expectations are related to negative experiences in the mentoring relationship (Sipe, 2002) Many of the more established SBM and CBM programs, such as Big Brothers Big Sisters and Upward Bound, provide their mentors with training and ongoing support (Dubois et al., 2002), and indeed have proven to be quite successful. There is little empirical data supporting the role of mentor

training in the outcomes of cross-age peer mentoring however, though there is evidence that a thorough training may be more important for youth mentors than for adults (Karcher, 2005a). Moreover, by utilizing college-aged mentors to work with at-risk youth who may not necessarily have the social or cultural capital that allows college matriculation to be more accessible (Coleman, 1988; Jarrett, Sullivan and Watkins, 2005), CAP is recognizing the potential for both parties to benefit from a cross-aged peer mentoring model (Karcher, 2005a). CAP mentors are explicitly taught how to work the topic of college into their everyday language and general discussions with their students in order to pique their interests and encourage an ongoing dialogue about the college-going process between the mentor and their mentee.

Cross-Peer and Collective Mentoring over Traditional Mentoring Models

There has been some literature touting the benefits of utilizing young adult mentors as ideal role models for demonstrating the successful transition to adulthood (Zarrett and Eccles, 2006), yet often, the demands of college students' schedules prohibits them from keeping consistent meeting times with their mentees (Sipe, 2002), which as noted earlier, can actually have adverse effects. CAP has found a viable alternative to offset this problem by promoting a collective or team-based mentoring model (Sipe 2005). It was been suggested that group mentoring may have important benefits for all youth, such as fostering positive peer interactions, particularly for minority and female students, for whom a collectivistic orientation is more culturally congruent (Karcher et al., 2006). CAP's collective mentoring model differs from descriptions of other school-based group mentoring programs in the literature however, in that students are not assigned to a specific group for mentoring, rather, students are mentored individually by a collective of mentors and peers who are also in the centers. An additional benefit of the collective approach is the much lower possibility of a mismatch between a mentor and mentee.

This is particularly relevant when students are looking to work with mentors who are proficient in specific academic areas, or who are able to provide particular college advice relevant to the mentee's interests.

Specific Mentoring Goals

As one might expect, college-going is a central theme of the College Ambition Program, and as such, our mentoring program encourages student academic achievement and emphasizes the importance of post-secondary matriculation. While studies have found that mentoring has a direct impact on academic achievement (Diversi and Mecham, 2005; Gordon et al., 2009; Grossman and Tierney, 1998), there is still debate on whether or not grade improvements were an indirect result of other variables (Rhodes et al., 2000), as well as the magnitude and duration of these academic changes (Bernstein et al., 2009; Rhodes and Dubois, 2008). As opposed to other school and community-based mentoring programs, research related to CAP is unique in that college matriculation is the ultimate goal of the overall intervention and the key outcome measure. Other mentoring programs do not necessarily insist on such a specific focus for the mentoring relationship, leaving the door open for unproductive mentor-mentee meetings with ambiguous outcomes.

Taken together, the College Ambition Program mentoring model has built upon known best-practices in the field while acknowledging some of the areas where SBM programs falter. In doing so, this study has found evidence from the mentors which mainly supports previous research on the benefits of mentoring, not just in regards to the youth, but to the young adults who have taken on the responsibility of mentoring them.

METHOD

The mentoring analysis looks at one element of the College Ambition Program which is comprised of three additional components aimed at creating a college-going culture in the intervention schools: course counseling; financial aid guidance; and college visits. The general study includes two urban and two rural treatment schools and four control schools that have been matched to the treatments based on state data with regards to student demographics, school organization, and college-going rates; this research only includes mentors in the two urban and two rural treatment schools. While the CAP intervention utilizes a model aimed at engaging the entire school with the goal of discerning which practices are best suited to grow and support a college-going culture, this particular analysis focuses solely on the mentoring component and the reported effects that mentoring at-risk high school students has on the college mentors.

Each treatment school has a "CAP Center," a classroom or resource room repurposed specifically for the program. As such, CAP Centers are generally outfitted with college paraphernalia such as pendants, brochures, applications, financial aid packets, maps, SAT/ACT study guides, and computers. CAP does not actively recruit students that fit a desired set of characteristics (e.g., those who are in the top 20% percent of their class, or those who are from underrepresented groups). CAP provides resources and academic support for any student who enters the center unless the student's parents have specifically opted out of the program. Most often, students come to the center after school and sit at large tables with other mentors and students. Nearly all of the interactions between mentors and mentee take place in this environment.

Sample: Mentor Profile

The CAP mentoring program relies on the partnerships and resources pulled from a local university where undergraduate and graduate students are recruited to serve as mentors and tutors for the treatment schools. Because of CAP's emphasis on STEM careers, mentor/tutor recruitment primarily focuses on those with academic majors that aligned with the program's emphasis on STEM. Formal relationships have been developed with the math, chemistry, and physics departments on campus, as well as the College of Osteopathic Medicine (COM), and a graduate student run group that promotes women in science. These relationships are in addition to partnerships with other departments that have traditionally included mentoring as an outreach or service learning component to their classes, such as psychology, teacher education, and human development. Often, service with CAP as offered through college courses comes with the added benefit of fulfilling an "honors" or extra credit option, which gives the student additional credit in their courses. The College Ambition Program also maintains a general posting on the university service learning site, making the program available for any college student who is looking to mentor and tutor students.

Since fall 2010, a total of 134 mentors have worked with CAP. Because of the targeted recruitment of our mentors, the mentor pool disproportionately represents STEM fields with 44% of mentors in STEM related academic majors, with all other fields representing the remaining 56%, with a majority of the non-STEM students coming from teaching programs. Research has shown that college-aged mentors tend to be women, and white (Clevenger & Cadge, 2010). The CAP mentor pool supports this literature with 63% of mentors being female, and 70.9% reporting their race as white. Other mentors reporting their race included 16.4% African-American, 7.5% Asian, and 1.5% Hispanic. Unreported races accounted for the remaining of

the pool. Of the 62 mentors who completed the exit poll, 40% reported volunteering with CAP through a course service learning requirement or honors option.

Mentor Training

Because of the presumably "natural" character of the mentor/mentee relationship, the formal training of mentors is sometimes overlooked in mentoring programs (Cannata, et al. 2008). In recognizing the necessity and importance of having mentors who are well informed and possess the requisite skills for working with at-risk youth, CAP has developed a comprehensive training orientation for mentors to attend prior to their service in the schools. Due to the varied academic and personal backgrounds of the mentors, the training is comprised of six parts to ensure a thorough understanding of the CAP mentoring model and the program expectations: a general overview of traditional mentoring practices and how the CAP program differs; an overview of the treatment schools' demographics; the unique needs of at-risk youth and how to respond to those needs; how to use divergent questioning as a means of cultivating more meaningful mentor/mentee interactions and sessions; how tutoring and mentoring coincide; and CAP research protocol. More specifically, the training reviews basic tenets of youth development and best practices for working with at-risk students, including the importance of maintaining physical and emotional safety, providing support while encouraging ownership and personal accountability, how to nurture positive interactions with peers and adults, and facilitating opportunities for choice and personal reflection. Mentors are also educated in the theories of social and cultural capital, and informed as to how they can harness their own capital in academically supporting their mentees. The final portion of the training instructs mentors in how to document their mentoring sessions using our web-based spreadsheet. Before leaving the

orientation, mentors choose which school they would like to volunteer at and complete the necessary paperwork.

Mentoring Model

One of the most significant differences between the CAP mentoring model and that of traditional mentoring models is that CAP does not match mentors to individual students. Instead, we utilize a collective model in the hopes of addressing the deficiencies found in other schoolbased mentoring programs, namely, the short duration and limited capacity of mentors to develop meaningful and authentic relationships with their mentees, an issue that has been found to have observable detrimental effects on students (Grossman and Rhodes, 2002). In that vein, CAP strives to nurture the relationships between the CAP mentors as a collective and the students as a collective in the hopes that any student who utilizes the CAP center will feel connected to the program and view any mentor in the CAP center as a potential resource and trusted adult. As such, while mentors were encouraged to try and develop mentor/mentee relationships with individual students, it was not expected that the same students would come into the CAP center on a consistent basis to work with a particular mentor, and therefore, mentors and mentees were not individually matched. All mentors are required to spend at least two hours a week in the CAP center, though some choose to spend additional time volunteering.

Procedures and Data Instruments

All data in this analysis was collected solely by the College Ambition Program. Starting in fall 2010, three mentor cohorts were given a mid-semester feedback poll and exit an exit survey (fall 2010, spring 2011, and fall 2011). From the 134 mentors trained, 46.3% responded to the exit poll, as such, all subsequent quantitative analyses related to this research only uses the data reported from these mentors. Both the feedback and the exit polls require mentors to

explain both their positive and more challenging encounters with students, and to provide any general feedback about the CAP program. The exit poll, which is accessed online through SurveyMonkey.com, is more specific to session content, asking mentors to rank particular elements of their mentoring experiences such as overall effectiveness, content knowledge, and the ability to draw on personal experiences in discussing academics. Open-ended questions were also included in the exit poll to allow for more detailed reflections. These questions centered on the mentors' changing perceptions and expectations of themselves and the students that they mentored. The data collected from these questions will inform the bulk of the analysis.

CAP also required mentors to document each session they had with a mentee using a shared "contact log" which feeds directly into a master spreadsheet. Nearly 70% of the total pool of mentors reported their contacts. The information in each entry includes: mentor name; school; mentees' name; mentee grade; purpose of session; length of contact; and spaces for the mentors to write a summary of the session and a short personal reflection. Mentors are instructed on how to access and complete the contact log during their orientation.

All mentor data, including descriptive statistics such as race, gender, and academic major were imported using the R-Project for Statistical Computing (R). All mentors and students were given unique identifiers in order to track dosage and follow mentor-mentee sessions yet to preserve the identities of the participants. Answers from the mentor contact logs, feedback forms, and exit polls were also imported into R and matched with the appropriate mentor in order to track which students the mentors worked with and how the mentor perceived the session in realtime and retrospectively. By analyzing the mentor contact logs, mid-semester feedback, and exit surveys this study aims to determine changes in mentors' expectations of themselves and their mentees over time. In looking at the correlations between the mentors' gender, ethnicity, total time spent mentoring, and STEM-status, and their reported changes in personal and student expectations, this study looks to identify any relationship between the variables. MANOVAs were run in an effort to analyze the variations in reported data between gender, ethnicity, and STEM-status groups. A logistic regression was run to detect differences in absolute expectation change between the different mentor groups, as noted above. A linear regression was run to measure the positive and negative expectation changes.

Variables and Coding

Using statistical program R, comments from mentor exit surveys and daily contact logs were coded to reflect the changing expectations and perceptions of mentors on their mentees. The independent variables analyzed are the following: gender; minority status; total contact time; and STEM major status. The outcome measures are: the reported change in the mentor's academic teaching style or career ambitions ("self.change.teaching"); reported changes in the mentor's interpersonal skills ("self.change.interpersonal); reported changes in the mentor's general social understanding or a greater understanding of themselves ("self.change"); reported changes of the mentor's academic expectations of students ("student.change.academic"); reported changes that the mentors noticed in the mentees on a personal level ("student.change.personal"); and reported changes in how the mentor's expectations of their mentees have changed over time ("student.expectation.change").

Coding

The coding for all variables are as follows:

- Gender was coded as: Female 0, Male 1
- Minority was coded as: White 0, African-American 1
- STEM status was coded as : Non-STEM majors 0, STEM majors 1
- Self Change, Self Change Teaching, Self Change Interpersonal, Student Change Academic, and Student Change Personal were coded as: Any positive changes in the reported data as 1, negative changes as 0
- Student Expectation Change was coded as: Any positive changes in the reported data as 1, negative changes as -1, no reported changes as 0
- Absolute Expectation Change was coded as: Any positive or negative changes in the reported data as 1, no changes were coded as 0

Table 1. Measures

Variable	Data Source (s)	Question(s)
Gender	Service Learning Background Check Form	Gender
Minority Status	Livescan Fingerprint Background Check forms, Drivers License	Race
Total Contact Time	Contact Logs	Calculated from master contact log spreadsheet
STEM Status	Exit Poll	What is your major?
Self Change	Exit Poll, Mid- semester feedback survey	 Has this been a positive experience for you? Why? Have you had had any negative experiences? What were they? Could they have been avoided? What have been your biggest surprises so far? What have been your biggest challenges so far? As a result of working with CAP, what (if any) changes did you see in yourself?
Self Change Teaching	Exit Poll	• As a result of working with CAP, what (if any) changes did you see in yourself?
Self Change Interpersonal	Exit Poll	• As a result of working with CAP, what (if any) changes did you see in yourself?
Student Expectation Change	Exit Poll, Mid- semester survey, contact logs	 How did your expectations of the students change after your work in this program? As a result of your work with CAP, what (if any) changes did you see in the students? What was the most challenging aspect of mentoring/tutoring? What was the most rewarding aspect of mentoring/tutoring?

Table 1 (cont'd)

Absolute Expectation Change	Exit Poll, Mid- semester survey, contact logs	 How did your expectations of the students change after your work in this program? As a result of your work with CAP, what (if any) changes did you see in the students? What was the most challenging aspect of mentoring/tutoring? What was the most rewarding aspect of mentoring/tutoring? Contact Log: Summary of Contact Contact Log: Personal Reflection
Student Change Academic	Exit Poll, Mid- semester survey, contact logs	 How did your expectations of the students change after your work in this program? As a result of your work with CAP, what (if any) changes did you see in the students? What was the most challenging aspect of mentoring/tutoring? What was the most rewarding aspect of mentoring/tutoring? Contact Log: Summary of Contact Contact Log: Personal Reflection
Student Change Personal	Exit Poll, Mid- semester survey, contact logs	 How did your expectations of the students change after your work in this program? As a result of your work with CAP, what (if any) changes did you see in the students? What was the most challenging aspect of mentoring/tutoring? What was the most rewarding aspect of mentoring/tutoring? Contact Log: Summary of Contact Contact Log: Personal Reflection

Mentor Feedback Poll

Thank you for taking the time to fill out this CAP evaluation. As this is our first school year in operation, we are constantly looking for ways to make this program a meaningful and beneficial experience for you and the students you mentor. Please answer the questions below. If you have any additional comments, please feel free to write them in.

NAME_____

- 1. Has this been a positive experience for you? Why?
- 2. Have you had had any negative experiences? What were they? Could they have been avoided?
- 3. If you could add or change anything about CAP, what would it be?
- 4. What have been your biggest surprises so far?
- 5. What have been your biggest challenges so far?
- 6. Are you planning to do this next semester?

Mentor Exit Poll

A survey link was emailed to all mentors during the last week of their service with CAP and was administered via Surveymonkey.com. *Required Answer

Name: Email Address:

*2. What is your Major?

*3. How did you hear about CAP?

- o Course Requirement
- o Flier
- From a friend
- Through an organization
- Other (please specify)

*4. Was mentoring with CAP part of a course requirement for you? If yes, which course?

Was mentoring with CAP part of a course requirement for you? If yes, which course?

*5. One a scale of 1-5, how effective do you think you were as a mentor/tutor?

Not Effective	(1)
---------------	-----

Very Effective (5)

*6. On a scale of 1-5, do you feel that the CAP center fostered a supportive and "community" environment?

Not At All (1)

Very Supportive (5)

*7. On a scale of 1-5, how often were you able to draw on your own college experiences and knowledge when talking to and helping students?

Never (1)

Very Often (5)

Mentor Exit Poll (Cont'd)

*8. Please indicate about the frequency of mentoring or tutoring you did.

Only Tutored // Mostly Tutored // Equal Amounts of Mentor and Tutoring // Mostly Mentored // Only Mentored

*9. On a scale of 1-5, how busy was the CAP center when you were there to mentor?

Empty (no students to help) (1) Full (many students to help) (5)

Short Answer Section:

1. Were you able to provide any students with an academic or career related connection that they might not have had access to otherwise?

2. What aspects of mentoring do you believe are most important in helping high school students enter college?

3. Were you able to provide your students with what you just described above?

4. How did your expectations of the students change after your work in this program?

5. As a result of working with CAP, what (if any) changes did you see in yourself?

6. As a result of your work with CAP, what (if any) changes did you see in the students?

7. What was the most challenging aspect of mentoring/tutoring?

8. What was the most rewarding aspect of mentoring/tutoring?

9. Do you have any additional comments or suggestions for CAP or regarding mentoring/tutoring?

RESULTS

Table 2. Summary of descriptive statistics of the data

	Ν	mean	Std.Dev.	min	Q1	median	Q3	max	missing values
Gender ^a	56.00	0.39	0.49	0.00	0.00	0.00	1.00	1.00	0.00
Minority ^b	56.00	0.14	0.35	0.00	0.00	0.00	0.00	1.00	0.00
STEM ^c	56.00	0.41	0.50	0.00	0.00	0.00	1.00	1.00	0.00
Total Contact Time	56.00	3.96	4.56	0.00	0.50	3.00	5.50	23.75	0.00
Self Change ^d	56.00	0.59	0.50	0.00	0.00	1.00	1.00	1.00	0.00
Self Change Teaching ^d	56.00	0.39	0.49	0.00	0.00	0.00	1.00	1.00	0.00
Self Change Interpersonal ^d	56.00	0.43	0.50	0.00	0.00	0.00	1.00	1.00	0.00
Student Expectation Change ^e	56.00	0.39	0.73	-1.00	0.00	1.00	1.00	1.00	0.00
Absolute Expectation Change ^f	56.00	0.68	0.47	0.00	0.00	1.00	1.00	1.00	0.00
Student Change Academic ^d	56.00	0.45	0.50	0.00	0.00	0.00	1.00	1.00	0.00
Student Change Personal ^d	56.00	0.50	0.50	0.00	0.00	0.50	1.00	1.00	0.00

^aGender: Female 0, Male 1

^bMinority: White 0, African-American 1

^cSTEM: Non-STEM majors 0, STEM majors 1

^dAny positive changes in the reported data was coded as 1, negative changes were coded as 0

^eAny positive changes in the reported data was coded as a 1, negative changes were coded as -1, no reported changes were coded as 0

^fAny positive or negative changes in the reported data was coded as 1, no changes were coded as 0

Table 2 gives a summary of descriptive statistics for all the variables used in this analysis. The total number of respondents for all the tests was 56, with no missing values. The table shows that 39% of the mentors in these analyses were male, 14% were African-American, and 41% were in STEM fields (Science, Technology, Engineering, or Mathematics). The mean total contact time was just under 4 hours, with the max contact time being 23.75 hours. A mean of 59% of respondents reported some type of self change, and 68% reported some sort of expectation or perception change in regards to their mentees. On average, the expectations that the mentors had of their students went up by .39.

	Gender	Minority	STEM	Total Contact	Self Change	Self Change	Self Change	Student Expec.	Absolute Expec.	Student Change
				Time	8-	Teaching	Interp.	Change	Change	Acad.
Total	-0.27*	-0.20	0.01							
Contact	(0.07)	(0.04)	(0.00)							
Time										
Self	-0.22	0.13	-0.04	0.18						
Change	(0.05)	(0.02)	(0.00)	(0.03)						
Self	-0.12	-0.33 *	0.22	0.21	0.23					
Change	(0.02)	(0.11)	(0.05)	(0.04)	(0.05)					
Teach ^d										
Self	-0.03	-0.04	-0.06	0.16	0.43 ***	0.12				
Change	(0.00)	(0.00)	(0.00)	(0.03)	(0.18)	(0.01)				
Interp ^d										
Std.	-0.18	0.20	0.00	0.08	0.10	0.22	0.18			
Expec.	(0.03)	(0.04)	(0.00)	(0.01)	(0.01)	(0.05)	(0.03)			
Change ^e										
Abs.	-0.31*	0.06	0.11	0.44 ***	0.20	0.32*	0.21	0.37**		
Expec	(0.09)	(0.00)	(0.01)	(0.19)	(0.04)	(0.10)	(0.04)	(0.14)		
Change ^f										
Std.	-0.13	0.25	-0.09	0.02	0.02	0.01	-0.05	0.16	0.16	
Change	(0.02)	(0.06)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.02)	
Acad. ^d										
Std.	-0.15	0.10	0.04	0.18	0.33 *	0.51***	0.22	0.30 *	0.46 ***	-0.04
Change	(0.02)	(0.01)	(0.00)	(0.03)	(0.11)	(0.26)	(0.05)	(0.09)	(0.21)	(0.00)
Personal ^d										

Table 3. Pearson correlation matrix with coefficient of determination (r^2) and significance levels for all variables

Table 3. Cont'd

Signif. codes: 0 *** 0.001 ** 0.01 * 0.05 . 0.1 1

^dAny positive changes in the reported data was coded as 1, negative changes were coded as 0

^eAny positive changes in the reported data was coded as a 1, negative changes were coded as -1, no reported changes were coded as 0

^fAny positive or negative changes in the reported data was coded as 1, no changes were coded as 0

Table 3 provides correlations with the proportion of explained variance (r²) and significance levels for all variables. Gender (Male) is shown to have a negative correlation with both total contact time and absolute expectation change, meaning that males were less likely to have longer contact times with their mentees and report any sort of expectation change. The table also shows a significant negative correlation for minority status and reported changes in teaching aspirations or abilities; None of the African-Americans mentors reported a change in teaching abilities or aspirations. The data also shows a strong correlation between total contact time and mentors' reports of absolute expectation change in their mentees, a relationship that will be explored in later tests. Lastly, Table 3 shows significant correlations between Self Change and Self Change Interpersonal; Self Change Teaching and Student Change Personal; and Absolute expectation change and Student Change Personal. Thus, mentors who reported a general change in self were also more likely to report changes in interpersonal abilities, changes in teaching aspirations or skills, as well as be more likely to report changes in their mentees.

	N	Total Contact Time (hrs)	Self Change (%)	Self Change Teaching (%)	Self Change Interpersonal (%)	Student Expectation Change (%)	Expectation Change Absolute (%)	Student Change Academic (%)	Student Change Personal (%)
gender		.04248*	-	-	-	-	.02484*	-	-
male	22	2.44 (-1.51)	0.45 (-0.13)	0.32(-0.07)	0.41(-0.02)	0.23 (-0.17)	0.50 (-0.18)	0.36(-0.08)	0.41(-0.09)
female	34	4.94 (0.98)	0.68 (0.09)	0.44(0.05)	0.44 (0.01)	0.50(0.11)	0.79 (0.12)	0.50(0.05)	0.56(0.06)
Minority Status		.04626*	-	0.00475 **	-	-	-	-	-
minority	8	1.77 (-2.19)	0.75 (0.16)	0.00(-0.39)	0.38 (-0.05)	0.75 (0.36)	0.75 (0.07)	0.75(0.30)	0.62(0.12)
non- minority	48	4.32(0.36)	0.56(-0.03)	0.46(0.07)	0.44(0.01)	0.33(-0.06)	0.67 (-0.01)	0.40(-0.05)	0.48(-0.02)
STEM Status		-	-	-	-	-	-	-	-
STEM	23	3.99(0.03)	0.57 (-0.02)	0.52(0.13)	0.39 (-0.04)	0.39(0.00)	0.74 (0.06)	0.39 (-0.06)	0.52(0.02)
non- STEM	33	3.94(-0.02)	0.61 (0.02)	0.30 (-0.09)	0.45 (0.03)	0.39(0.00)	0.64 (-0.04)	0.48(0.04)	0.48(-0.02)
totals	56	3.96	0.59	0.39	0.43	0.39	0.68	0.45	0.50

Table 4. Effects of gender, minority, and STEM status on the means

Signif. codes: 0 *** 0.001 ** 0.01 * 0.05 . 0.1 1

Gender: Female 0, Male 1

Minority: White 0, African-American 1

STEM: Non-STEM majors 0, STEM majors 1

Any positive changes in the reported data was coded as 1, negative changes were coded as 0

Any positive changes in the reported data was coded as a 1, negative changes were coded as -1, no reported changes were coded as 0

Table 4 shows the effects of gender, minority, and STEM status on the means of the other measured variables. Overall, this table shows that gender and minority status have significant effects on total contact time, and changes in teaching expectations and absolute student expectation changes. The significance of these effects was generated by an ANOVA, which can be found in Tables 8 and 10. While gender and ethnicity were correlated to changing expectations in Table 3, some of those correlations may be influenced by the lower contact times reported by these groups of mentors. This relationship is explored later in Tables 11 and 12.

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	DF	Pillai	Approx F	Num DF	Den DF	Pr(>F)		
Gender	1	0.151	1.094	7	43	0.383		
Minority	1	0.360	3.460	7	43	0.005 **		
STEM	1	0.088	0.595	7	43	0.756		
Gender: Minority	1	0.131	0.928	7	43	0.494		
Gender: STEM	1	0.136	0.972	7	43	0.463		
Minority: STEM	1	0.141	1.012	7	43	0.435		
Residuals	49							

Table 5. MANOVA for all reported changes in personal and student expectations

Signif. codes: 0 *** 0.001 ** 0.01 * 0.05 . 0.1 Gender: Female 0, Male 1

Minority: White 0, African-American 1

STEM: Non-STEM majors 0, STEM majors 1

	DF	Pillai	Approx F	Num DF	Den DF	Pr(>F)
Gender	1	0.062	1.043	3	47	0.382
Minority	1	0.188	3.647	3	47	0.019 *
STEM	1	0.057	0.952	3	47	0.423
Gender: Minority	1	0.055	0.918	3	47	0.439
Gender: STEM	1	0.113	2.012	3	47	0.125
Minority: STEM	1	0.080	1.365	3	47	0.265
Residuals	49					

Table 6. MANOVA for mentor reported changes in self expectations (teaching, interpersonal, and self)

Signif. codes: 0 *** 0.001 ** 0.01 * 0.05 . 0.1

Gender: Female 0, Male 1

Minority: White 0, African-American 1

STEM: Non-STEM majors 0, STEM majors 1

The MANOVAs in tables 5 and 6 show that there is a significant difference in how African-Americans reported changes in all personal and student expectations as well as in their reported changes in self expectations. These statistics are supported by the above correlation and effects tables. However, as noted before, these differences cannot be attributed solely to race, as on average, African Americans reported significantly less contact time with their mentees than the rest of the sample.

Table 7. MANOVA for mentor reported changes in student expectations, academic and personal

	DF	Pillai	Approx F	Num DF	Den DF	Pr(>F)
Gender	1	0.105	1.856	3	47	0.149
Minority	1	0.066	1.121	3	47	0.350
STEM	1	0.025	0.416	3	47	0.741
Gender: Minority	1	0.043	0.709	3	47	0.550
Gender: STEM	1	0.005	0.089	3	47	0.965
Minority: STEM	1	0.039	0.647	3	47	0.588
Residuals	49					

Signif. codes: 0 *** 0.001 ** 0.01 * 0.05 . 0.1

Gender: Female 0, Male 1

Minority: White 0, African-American 1

STEM: Non-STEM majors 0, STEM majors 1

The MANOVA in table 7 is worth noting simply for its lack of significance. Here the data show that none of the groupings of mentors reported significantly different changes in their expectations of their mentees, perhaps indicating that expectation change in students does have more to do with total contact time or other external factors.

				1	0	
	DF	Sum Sq	Mean Sq	F value	Pr(>F)	
Gender	1	1.155	1.155	5.359	0.024*	
Minority	1	0.000	0.000	0.002	0.960	
STEM	1	0.208	0.208	0.969	0.329	
Gender: Minority	1	0.256	0.256	1.188	0.280	
Gender: STEM	1	0.009	0.009	0.042	0.838	
Minority: STEM	1	0.020	0.020	0.094	0.759	
Residuals	49	10.563	0.215			

Table 8. ANOVA for mentor reported changes in absolute expectation change of students

Signif. codes: 0 *** 0.001 ** 0.01 * 0.05 . 0.1

Gender: Female 0, Male 1

Minority: White 0, African-American 1

STEM: Non-STEM majors 0, STEM majors 1

Table 8 shows significance for gender when looking at mentors' absolute expectation change of the mentees. The mean level of absolute expectation change for male students is significantly

different from their female counterparts.

	DF	Sum Sq	Mean Sq	F value	Pr(>F)
Gender	1	0.013	0.013	0.055	0.814
Minority	1	0.038	0.037	0.152	0.697
STEM	1	0.062	0.062	0.252	0.617
Gender: Minority	1	0.156	0.156	0.631	0.430
Gender: STEM	1	0.243	0.242	0.978	0.327
Minority: STEM	1	1.027	1.027	4.135	0.047*
Residuals	49	12.172	0.248		

Table 9. ANOVA for mentor reported changes in interpersonal ability

Signif. codes: 0 *** 0.001 ** 0.01 * 0.05 . 0.1 Gender: Female 0, Male 1 Minority: White 0, African-American 1 STEM: Non-STEM majors 0, STEM majors 1

Table 9 shows significance for students who are both African-American and in STEM in their reported changes in interpersonal ability. However, it should be noted that only two mentors fell into this category, so while it is statistically significant, the result should not be generalized

		1	0 0	1	U	-
	DF	Sum Sq	Mean Sq	F value	Pr(>F)	
Gender	1	0.202	0.202	0.992	0.323	
Minority	1	1.781	1.781	8.752	0.004 **	
STEM	1	0.467	0.467	2.294	0.136	
Gender: Minority	1	0.068	0.068	0.336	0.564	
Gender: STEM	1	0.863	0.863	4.243	0.044 *	
Minority: STEM	1	0.000	0.000	0.001	0.967	
Residuals	49	9.973	0.203			

Table 10. ANOVA for mentor reported changes in teaching aspirations or teaching ability

Signif. codes: 0 *** 0.001 ** 0.01 * 0.05 . 0.1

Gender: Female 0, Male 1

Minority: White 0, African-American 1

STEM: Non-STEM majors 0, STEM majors 1

In Table 10, both African-Americans and males in STEM majors showed significant differences in reported changes in teaching aspirations. This supports tables 3 and 4 which shows differences in the means of the data reported from the African-American mentors. However, the significance shown here for male STEM majors necessitates further investigation.

	Estimate	Std. Error	Z value	Pr(> z)	_
(Intercept)	-1.071	0.905	-1.183	0.236	
Gender	-0.486	1.101	-0.442	0.658	
Minority	1.911	1.464	1.305	0.191	
STEM	0.752	1.237	0.608	0.543	
Total Contact	0.737	0.239	3.073	0.002 **	
Gender: Minority	-17.920	3956.180	-0.005	0.996	
Gender: STEM	-1.004	1.656	-0.606	0.544	
Minority: STEM	13.097	2737.738	0.005	0.996	

Table 11. Logistic regression for absolute expectation change of mentors onto their mentees

Signif. codes: 0 *** 0.001 ** 0.01 * 0.05 . 0.1

Gender: Female 0, Male 1

Minority: White 0, African-American 1

STEM: Non-STEM majors 0, STEM majors 1

Null deviance: 70.329 on 55 degrees of freedom Residual deviance: 42.642 on 48 degrees of freedom

AIC: 58.642

Number of Fisher Scoring iterations: 16

Table 12. Linear regression for expectation change of mentors onto their mentees measured as 1,0,-1

	Estimate	Std. Error	t value	Pr(> t)	_
(Intercept)	0.466	0.139	3.348	0.001 **	
Gender	-0.095	0.178	-0.537	0.593	
Minority	0.280	0.230	1.220	0.228	
STEM	0.147	0.168	0.875	0.385	
Total Contact	0.044	0.013	3.173	0.002 **	
Gender: Minority	-0.651	0.498	-1.307	0.197	
Gender: STEM	-0.062	0.254	-0.247	0.806	
Minority: STEM	-0.075	0.399	-0.188	0.851	

Signif. codes: 0 *** 0.001 ** 0.01 * 0.05 . 0.1

Gender: Female 0, Male 1

Minority: White 0, African-American 1

STEM: Non-STEM majors 0, STEM majors 1

Residual standard error: 0.4265 on 48 degrees of freedom

Multiple R-squared: 0.2851, Adjusted R-squared: 0.1808

F-statistic: 2.734 on 7 and 48 DF, p-value: 0.01797

Residuals:

Min 1Q Median 3Q Max

-0.7470 -0.4199 0.1232 0.3318 0.6298

Coefficients: (1 not defined because of singularities)

The logistic regression run in Table 11, and the linear regression in Table 12 for expectation change shows that there is most certainly a contact time effect on both absolute expectation change and change as measured on a 1,0,-1 scale as shown by the estimates and significant p-values associated with that variable. Indeed, Table 12 shows that for every extra hour of contact time, the mentors reported positive expectation changes went up by .04, which was statistically significant.

DISCUSSION

"I do feel that I became more open. Just being in a urban school environment improved my acceptance of the diversity of students."

Mentors' Documented Changes in Self:

The data presents some interesting findings about the changing expectations and perceptions reported by the CAP mentor pool. As the literature suggests, through mentoring youth, mentors gain a deeper acknowledgement and appreciation of their expertise as well as the further development of leadership skills (Wollman-Bonilla, 1997; Tsang, 1999), which is often tied to an increase in self-esteem, greater social insight, and improved social and interpersonal skills (Gaston and Jackson, 1998; Good, Halpin, and Halpin, 1998; Tsang 1999). The CAP data supports these assertions, particularly in Table 4, which shows the effects of gender, minority status, and STEM major status on the means of the other measured variables. According to this table, 59% of mentors reported some type of change in self, with 68% of females, 45% of males, and 75% of African-American mentors documenting a modification in their perceptions of their world-view or understanding of their mentees. The table also shows that 43% of all mentors reported some sort of interpersonal change, with females just slightly more likely to report a change in their interpersonal abilities on average than males at 44% over 41% respectively.

"I think it [mentoring] helped me become more outgoing. Students won't always come to you, you have to check in with them and ask if they need help. I am more introverted so it was a good experience for me."

Due to the decidedly STEM emphasis of CAP, it is also useful to note the differences in reported self changes by mentors who were and were not in STEM majors. In Table 4, the data show that both STEM and non-STEM majors are nearly equal in their reported self change (57% to 61% respectively). And both groupings of mentors were also about as likely to report changes in interpersonal abilities (39% for STEM and 45% for non STEM). The effects of being in

STEM on reported changes in teaching aspirations or abilities was noticeable, with 52% of STEM majors reporting a teaching change, which was on average 13% more than the entire sample. This is consistent with the literature which discusses the benefits of mentoring for service learning volunteers on the development of their academic expertise. It should be noted that none of these differences were statistically significant based on the p-values generated by the ANOVAs run for these particular outcome variables (See Tables 9 and 10).

"The biggest change that has occurred is that I am no longer an education major. I realized by participating in service learning that it wasn't teaching that I loved as much as social work."

With regards to reported changes in teaching aspirations or instructional abilities, whether or not a mentor was white or African-American was statistically significant as shown in Table 4. The effects table shows an average of 46% of white mentors reporting a change in teaching, while 0% of African-Americans reported any changes in their teaching, a finding that was significant. However, it should be noted that this finding may not be solely attributed to minority status, but rather to total contact time which has been shown in this data and in the greater literature to be a major predictor of mentoring outcomes. Based on the contact logs completed after each mentoring session, African-Americans had only 1.77 hours of contact time on average, 2.19 hours less on average than the sample as a whole. Whites had an average of 4.32 hours of contact time.

"I saw that I am no longer afraid of teaching at an urban school, and that I am more accepting of how to teach all kinds of students no matter where they're from."

The MANOVAs in Tables 5 and 6, confirm that overall, African-Americans were found to respond differently than other groupings of mentors when reporting changes in their personal and mentee expectations, and in reporting changes in their teaching and interpersonal abilities, with significant p-values. The ANOVA in Table 10 which measured mentors' reported changes in teaching aspirations or ability, also showed significance for minority status, as well as for males in STEM majors.

Based on the correlation and effects data in Tables 3 and 4, in addition to the MANOVAs in Tables 5 and 6, it would seem that the biggest predictors of reported changes in self (which includes teaching ability, interpersonal skills, and general changes in world-views) are that of gender and race, with females more often reporting self change than males, and African-Americans reporting more instances of self-change on average than whites.

Mentors Documented Changes in Their Mentees:

"My expectations with these students changed dramatically. At first I thought the students wouldn't want to cooperate or do their work, but they really do have the self motivation, just sometimes not all the materials."

The data reported by the mentors in regards to their changing expectations and perceptions of their mentees also proved to be insightful and consistent with the literature on the benefits of mentoring at-risk youth. On average, the expectations that the mentors held of their mentees went up by 39% according to the summary of descriptive statistics in Table 2, with 68% of mentors reporting an "absolute" expectation change. The absolute change category is noteworthy in that it shows that regardless of whether the change in expectations was positive or negative, a vast majority of mentors' expectations were modified based on their experiences - an encouraging finding that indicates growth and maturity among the mentor group . In regards to an absolute expectation change (i.e., any reported changes in the mentors expectations or perception of their mentees), Table 4 indicates that 79% of females reported some sort of change in the expectations of their students as opposed to only 50% of males. African-Americans were

also more likely to report an absolute expectation change than whites at 75% which was 7% more than the entire sample on average.

In the past I have worked with Faith¹ and realized she has some trouble accomplishing her schoolwork on time. And when she does, it is usually late due to the fact she hardly attends school. I learned that last week she missed and entire week because she was moving and she also got suspended. I think that if Faith just had the right role model she could do great things, so that's my goal for Faith. I feel that if I can give her someone to look up to I will be accomplishing a lot with her.

The effects of being a STEM major had little difference in regards to the mentors reported changes in student expectations or perceptions. Indeed, none of the differences in reported changes were shown to be significant when comparing STEM to non-STEM majors. in fact, the data in Table 4 shows that gender and minority have the largest effects on student expectation changes.

The logistic regression in Table 11, which measured the absolute expectation change of mentors onto their mentees, showed that there is a significant contact time effect, which is also consistent with the effects data in Table 4, and the correlation matrix in Table 3 which showed a significant correlation between total contact time and absolute expectation change. This statistic is aligned with the literature that speaks to the relationship between greater contact time and the noticeable benefits for both the mentors and the mentees. The linear regression for expectations change of mentors onto their mentees when measured as 1,0,-1, supports the above data, showing that for every extra hour of contact time, the reported changes in expectations or perceptions of their students went up by .04, which was significant.

¹ Names of students and mentors have been changed.

CONCLUSION

"The students are very motivated and smart and they have goals and aspirations. They really want to do well in school and make something of their lives and hopefully be able to give back to the community or the world."

Overall, the CAP data on mentor expectations is consistent with the literature on mentoring and the benefits of service learning opportunities for college aged students. Of all the input variables - gender, minority status, STEM status, and total contact time - the data show that total contact time had the greatest effect on whether or not a mentor reported any changes in expectation or perception of their mentees. Though, nearly all the tests showed either a gender or minority effect on the reports of changing expectations in self, with males consistently showing to be less likely to report changes in self or in their students.

It did not seem to matter if the university students were enrolled in a STEM major or not in whether they reported changes in themselves or their mentees, with the exception of reported changes in their teaching abilities or aspirations where STEM majors were on average 13% more likely to report some sort of change. This was interesting because a majority of mentors were recruited from the university's teacher education program.

Based on the data and the comments written in the mid-semester surveys and exit polls, the majority of mentors did report a positive change in their interpersonal abilities, or a change in their world-view, with a handful of mentors documenting changes in their feelings about teaching urban students or how they have learned to be more patient with their mentees when working on course work.

"If it was [right]I would give him a high five and he could have a huge smile on his face. If he was wrong, he would try again to get the right answer, but he did not want me to help him. He wanted to do it on his own. Once he obtained the correct answer, I would then give him a high five. Once again he would get a large smile and it looked as though he was proud of his accomplishments." As reported above, 68% of mentors reported some type of expectation or perception change in regards to their mentees by the conclusion of their service learning. Even for those mentors who reported a negative change in their expectations of their students, this is an encouraging statistic, as it shows mentor's expectations becoming more realistic based on their actual experience rather than assumptions. The most reliable indicator of absolute expectation change in students was length of contact time, which is a logical conclusion.

The issues that arose from this study that likely had an effect on the data, such as a small sample and lack of an expectations pre-test can be easily amended in subsequent studies. The implications of the results however, can be readily applied to service learning opportunities for college students as this data does support the greater literature on the importance of providing volunteer and service learning opportunities for students.

Taken together these findings support the greater literature in suggesting that the benefits of the mentoring relationship is indeed reciprocal, particularly in regards to a greater awareness of self, and a greater ability and confidence academic pursuits. Furthermore, the CAP data supports previous research on the importance of consistent mentoring sessions, as the length of time the mentor and mentee interact has shown to have a direct effect on the perceived quality, general impact, and overall benefits of the relationship.

"During this session, I helped Jack with his homework. At first, he didn't know how to start the problems. After I told him the process behind each problem he had a better idea of what he had to do. At the beginning of the assignment, he was unsure of some of the steps and unsure of his answers at the end. He would ask me if the answer was correct after he worked through the problems. Towards the end of the assignment, Jack was more confident about his answers and said them with a matter of fact attitude. He knew they were correct without asking me. It was wonderful to see him gain this confidence." WORKS CITED

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