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Approval Sheet

Assessing youth perceptions of the Pipeline Program at Emory University School of Medicine

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Assessing youth perceptions of the Pipeline Program at Emory University School of Medicine

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B.A.
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2005

M.D.
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2011

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An abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of
Master of Public Health
in Global Health
2011

Abstract

Assessing youth perceptions of the Pipeline Program at Emory University School of Medicine

By: Grace Victoria Hunte

Background: In 2007-2008 the national average freshman graduation rate from a public high school was 74.9%. Georgia ranks among the lowest states in high school graduation rates at 65.4%. This is especially concerning given that the age-adjusted mortality rate of high school drop outs aged 28-64 was more than two times the mortality rate of those with some college in 1999. Mentoring programs have been implemented across the country for decades in an effort to address the poor high school graduation rates. The Pipeline Program is a three tiered mentoring program where students from a public high school come to the university's School of Medicine for problem-based learning sessions beginning in the sophomore year. They are paired with sophomore University undergraduate students, and medical students lead the sessions on medical and public health topics.

Objective: The study aims to assess high school students' perspectives and experiences of the Pipeline Program, mentoring and academic performance.

Methods: Male and female sophomore high school students participated in two focus group discussions at the beginning of the program year, and again at the end. The qualitative data was analyzed using the grounded theory approach where the recorded data was transcribed, de-identified and codes or themes were generated. These codes were in turn used to analyze the data and provide a framework for theory building.

Results: Students identify their mentors as one of the strengths of the program, but they wish they could spend more time with them outside of the sessions. They expect the program to be a resume-builder and give them exposure to college and the medical field. The girls and boys differed on some key opinions, but overall thought the program was worthwhile, but that it demands a lot of hard work.

Discussion: Increasing understanding of what youth want to get out of a mentoring program is critical. The mentor relationship is key to the success of the pipeline program and efforts need to be made for ongoing training and support. Further research is needed to characterize the relationship from the mentor's perspective, how best to meet their needs and produce quality relationships with youth.

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Acknowledgments

Special thanks to:

- The Pipeline program for allowing me access to the students and making room and space during their sessions to conduct the research
- Lauren Fields, Jordan Rose and Matthew Topel who served as moderators for the focus group discussions
- Monique Hennink for her patience, guidance and unfailing support throughout this process
- Angela Rozo for her support, diligence, availability and willingness to help throughout this process

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Chapter 1: Introduction

The current economic climate has made education and educational programs vulnerable to budget cuts and funding shortages. Yet in some ways, it is the strength of the nation's educational system that powers economic growth. Perhaps more importantly, education or lack of education directly correlates with positive or negative health outcomes of communities, which in turn has implications on the economy(1). Moreover, the disparities in education outcomes have perpetuated and enhanced disparities in health outcomes. Mentoring programs targeting elementary, middle and high school students have been implemented to help fill the gap, working under the rational that mentorship will help students avoid risky health behavior and promote academic success(2).

Problem Statement

The relationship between education and health has been well documented, though it is not completely understood. The level of education achieved is directly related to health outcomes, and this relationship has produced significant health disparities. For example, the age-adjusted mortality rate of high school dropouts aged 28-64 was more than two times the mortality rate among those with at least a year of college in 1999(2). Likewise, the age-adjusted proportion of adults aged 18 or older in 2008-2009 with cardiovascular disease was 11.5% nationally. Among those without a high school diploma or GED, 14.5% had cardiovascular disease compared to 12.7% and 12.4% among those with a high school diploma/GED or those with some college respectively(3).

Cardiovascular disease (CVD) is the leading cause of death in Georgia, accounting for 32% of deaths in 2007, and CVD cost the state an estimated $11.2 billion in 2007(1).

The average freshman graduation rate (AFGR) is an estimate of public high school students who graduate on time with a regular diploma. In 2007-2008 the national AFGR was 74.9%, and Georgia ranks among the lowest in the country at 65.4%(4). The cost of these poor graduation rates is not just felt in terms of public health, but also in lost wages and earnings to the individual as well as Georgia. For example, students who failed to graduate with the class of 2008 will cost the state approximately $15.5 billion over their life-times(5).

The issue of poor graduation rates nationally and in Georgia specifically undoubtedly has adverse public health and economic implications. Mentorship programs have long been designed and implemented with the hope that they would help improve graduation rates and college matriculation. The concept of a mentor is simple and age-old. A mentor is a person who has gone before, blazed a trail for someone to follow and provides some guidance. They are designed to be a source of support and encouragement, to help navigate challenges and form a long-standing relationship. Over the years numerous studies have evaluated various mentorship programs, focusing on what makes a good program and a good mentor that will produce results. Most of these programs and studies focus on elementary or middle school aged students(6, 7). However, there is a lack of information about mentoring programs targeting high school students. Additionally, the perspective of previous research has focused on the program, and training mentors. Few studies have delved into the perspectives of the mentored students,

their expectations and what they hope to get from the programs. Some might argue that high school students are too old to reap the full benefit of these programs. Most of the literature focuses on developing "best practices" for mentoring programs and training the mentors(8). While these are important and integral to the success of a program, a knowledge gap exists where the perspectives of the youth have not been fully explored. In addressing the issue of poor education outcomes and health, the youth, and adolescents in particular can help frame the solutions.

Purpose Statement

The purpose of this research was to evaluate the Pipeline mentoring program of Emory University that targets high school students and ultimately make recommendations that can improve the program and others like it. The over-arching goal was to explore the perspectives and experiences of the sophomore high school students regarding academic achievement, mentors and the Pipeline program. The research sought to answer the following research questions:

- What are the high school students' experiences with the Pipeline program?
- What are the high school students' experiences with their mentors?
- What are the high school students' perspectives on academic performance?

Significance Statement

Insights derived from the high school students will help inform improvements in the Pipeline program, which may be applied to other mentoring programs targeting high

school students. It will also help ensure that there is not a disconnect between what educators value and want to impress on students, and what the students value and what they actually want and need.

Chapter 2: Review of the Literature

Introduction

Formal mentoring programs have been implemented in the United States since the mid-1980s, however, rigorous evaluation of the impact of these programs on youth have been limited. This literature review focuses on relevant articles published since 2000. Search terms such as “mentoring program,” “mentoring” and “youth mentors” were used to search in PubMed, ERIC and GoogleScholar, limited to children under 18 years and with a focus on high school students. This review will first provide an overview of the literature focusing on review articles, the theory behind mentoring programs and “best practices” for effective programs. Second, a review of some individual studies and evaluations of mentoring programs will be discussed. Third, the problem will be discussed in a more global context in terms of the linkages between mentoring programs, health, education and economics. Then, the Pipeline mentoring program will be discussed in detail with comparisons to other programs described in the literature. Finally, the literature will be summarized and how the current project will build on the literature will be discussed.

Theory and best practices

Perhaps the most rigorous and most oft cited evaluation of mentoring programs comes from a meta-analysis published by DuBois et al in 2002. They reviewed 59 evaluations of the effects of mentoring on youth from 1970 to 1998 and found that on average, mentoring programs had a positive effect on youth and that the benefits of

mentoring may generalize to a broader range of strategies to incorporate into programs using mentoring as an intervention. However, the programs were found to have small effect sizes or modest magnitudes of benefit. The average estimated effect sizes of the evaluations reviewed were 0.14 and 0.18, given the assumptions of fixed and random effect respectively(6). DuBois et al suggest that programmatic and other variables are important to address in order to maximize and achieve the potential benefit of mentoring programs. Their review offered three key contributions to the literature. First, they noted some theory-based and empirically-based indices of best practices for mentoring programs that were shown to be important moderators of program effectiveness, and could in fact enhance the effectiveness of programs when implemented(6). Table 1 provides a list of these best practices, which focus on providing adequate support and structure for effective mentoring relationships to develop. These program features include ongoing training for mentors, structured activities for mentors and youth, expectations for frequency of contact, mechanisms of support and involvement of parents, and monitoring of overall program implementation(6).

Second, they highlighted the fact that the intensity and quality of relationships established between mentors and youth is a critical moderator of effect, which suggests that frequency of contact, emotional closeness and longevity play important roles in characterizing the relationship(6). Third, they identified a key target population for mentoring programs, where they offer the greatest potential benefits to youth considered to be at-risk, especially those experiencing environmental risk (low family socioeconomic status) alone or in conjunction with individual risk (academic failure)(6).

Mentoring Interventions seemed to be most successful as a preventative tool where they targeted vulnerable youth because of their present circumstance, but before they manifested significant dysfunction as a result of their situations. The reverse is not necessarily true and this raises an important caveat; these programs cannot act as a treatment plan as individuals exhibiting significant dysfunction often have complex and unique needs that most volunteer mentors are not equipped or trained to meet(6).

Table 1. Theory-Based Index of Best Practices for Mentoring Programs(6,9)*

Key Principles	Program Features
Time	• Length of involvement with mentor
	• Frequency of contact with mentor
Preparation: pre-match	• Mentor screening
	• Matching of youth-mentor pair
	• Mentor training prior to match
Support: post-match	• Ongoing mentor support
	• Structured activities
	• Monitoring of mentoring relationship
	• Individual supervision
	• Mentor support group
	• Formal parent involvement

*Table adapted from Randolph and Johnson, 2008

Randolph and Johnson (2008) reviewed eight outcome evaluation studies of school-based mentoring programs in order to compare conceptual frameworks, program features, evaluation methods and youth outcomes in light of the best practices proposed

by DuBois et al. None of the programs outlined a specific theoretical framework upon which their program was designed. However they all appeared to be guided by the risk and resilience perspective, embedded in a prevention framework(9). For example, they recognized that some children have risk factors like poverty that predispose them to poor outcomes. Resilience is how children or individuals overcome their risk factors and achieve success despite them. In this perspective, mentoring relationships provide a protective influence by facilitating resilience, that is, they help children overcome their risk factors to achieve successful outcomes. The prevention framework can take three forms, universal, selective or indicated. Universal prevention programs include all members of a population. In contrast, selected prevention programs target people who are at above average risk for a poor outcome. Indicated prevention programs target high-risk individuals(9). Seven of the programs in Randolph's review were selective prevention programs and one was a universal program working under the belief that all children experience some level of risk. All of the programs incorporated expectations for length of mentor involvement and frequency of contact with their mentee. They also all had some form of mentor training prior to the match, and all but one incorporated structured activities into the program and monitored the mentoring relationship. Most programs that screened mentors had some criteria for matching mentors with youth. However, most of the programs lacked post-match support with only a few programs having the infrastructure for individual supervision, mentor support groups or ongoing mentor training. Only two programs had mechanisms for formal parent involvement(9).

The programs measured the effect of mentoring on behavior and attitudes ranging from school connectedness or academic engagement to involvement in bullying or fighting. Only two programs assessed impact on academic performance and five studies focused on multiple relationship domains including school, peers and family. The main benefit of these school-based mentoring programs was increased connectedness at school, in the family and in the community. Interestingly, no differences in grade point averages were found in the evaluations that compared a treatment and control group or a pre- and post-test assessments. Mentored students with a low GPA at baseline did show significant improvement by the end of the intervention compared to the comparison group(9). The review also highlighted how the quality of the mentoring relationship is a critical moderator of effect. Youth who reported effective mentoring had high GPAs and were less likely to drop out compared to youth who reported ineffective mentoring(9). The importance of length and quality of the mentor relationship is supported throughout the literature. A randomized evaluation of Big Brothers Big Sisters of America's (BBBSA) school based mentoring program (SBM) found that students who had longer and higher quality relationships with their mentors experienced bigger benefits than students who experienced shorter relationships or lower quality relationships(10). In fact, in the second year of the program evaluation those who experienced lower quality mentor relationships showed declines in their academic performance compared the non-mentored control group(10). Likewise, an evaluation looking at "effectively" mentored 10th graders compared to "ineffectively" mentored students and a control group found that effective mentoring yielded higher academic achievement compared to controls. Yet, ineffective

mentoring was associated with a decline in academic achievement(11). Rhodes postulated that the small effect sizes found in meta-analysis and reviews could be due to a masking of positive outcomes because of neutral or negative outcomes associated with poor mentoring relationships(10).

Randolph and Johnson also proposed an important addition to the list of best practices. All the programs identified the importance of teachers and school staff investing in the programs, thus, they propose that engaging school staff should be a part of every program. In the same vein, fostering parent involvement can enhance program effects as parents can help reinforce and support the mentor relationship(9). Parent involvement is largely lacking in most mentoring programs and should be incorporated in order to utilize another source of support for the mentor relationship.

The literature recognizes that the quality of the mentor relationship is a key determinant of the potential outcomes, and numerous studies have found that the length of the relationship is an important component that helps develop the relationship. Research is lacking on the theory behind relationship development and specifically what a quality and effective relationship looks like. Sipe contends that the key ingredient of an effective relationship is the “development of trust between two strangers,” that again requires time to develop(11). She also states that the development of high levels of trust is determined by the approach of the mentor. For example, mentors who prioritize building trust and friendship with their mentees are more effective compared to mentors who are dogmatically goal-oriented and focus on “reforming” their mentees(11). Sipe described some characteristics of effective and ineffective mentors outlined in table 2

(11). In general, a trusting and consistent mentor relationship predicts more positive outcomes in youth compared to a mentor's focus on specific goals(12).

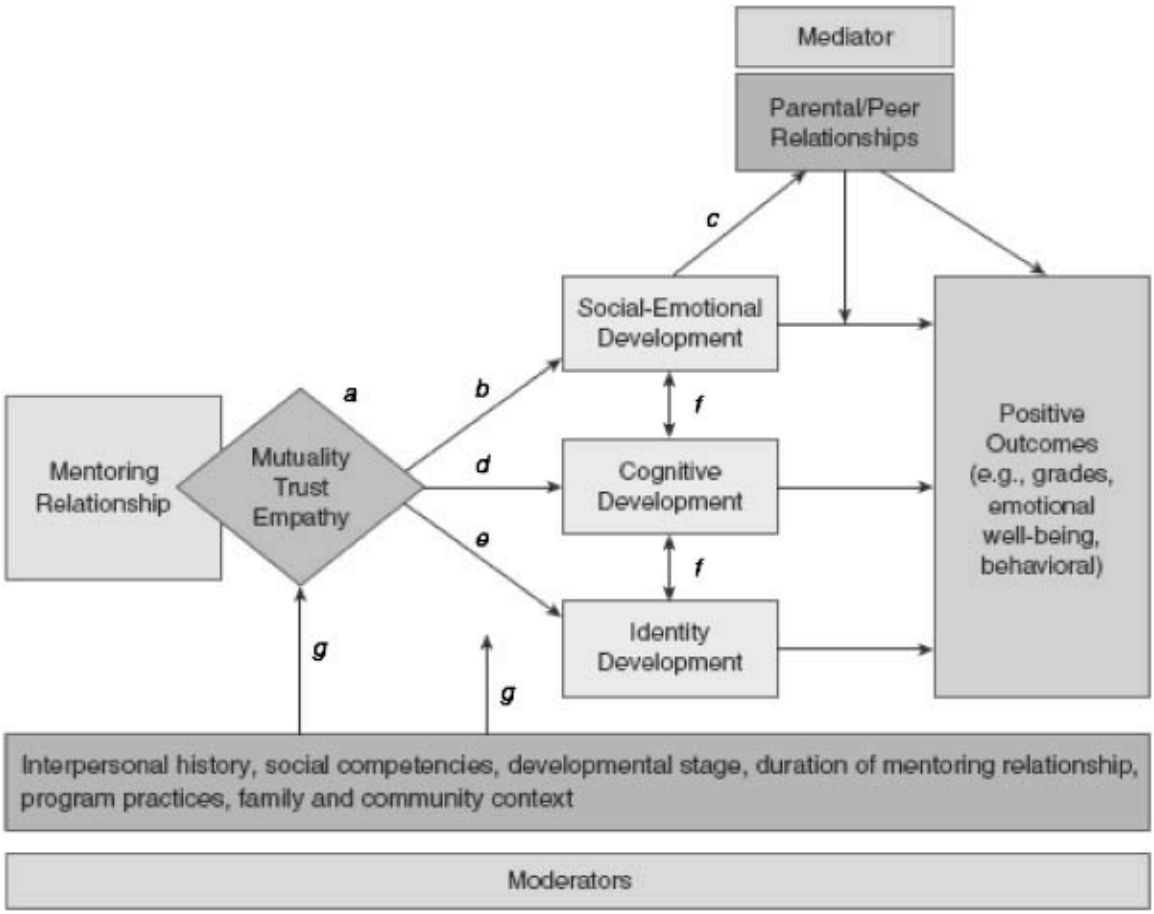
Rhodes echoed similar sentiments and depicted them in a model in figure 1, that describes several processes and conditions important for understanding how mentoring relationships affect youth(7). First, the limiting factor for the potential positive effects of mentoring is the development of a strong relationship characterized by mutuality, trust and empathy (component *a*). Again, this development is dependent on time. For example, in an evaluation of BBBSA, the positive effects on youth outcomes were directly proportional, and became stronger the longer relationships lasted, and were greatest when relationships lasted at least a year(7). The approach of the mentor is also critical, and the most effective relationships develop when "mentors adopt a flexible, youth-centered style in which the young person's interests and preferences are emphasized" compared to focusing on the mentor's agenda or expectations for the relationship(7).

Table 2. Characteristics/practices of effective and ineffective mentors(11)

Effective Mentors	Ineffective Mentors
• Are consistent and dependable • Take responsibility for initiating and developing the relationship • Respect the youth's perspective and are open and flexible • Take the time to learn the youth's interests and provide options for how to spend their time together • Pay attention to youths' need for fun • Are better acquainted with the youth's family • Seek and use the help and advice of program staff	• Are inconsistent and don't meet regularly • Attempt to place a set of values on the youth that may be different from their family's values • Adopt a parental or authoritative role and attempt to reform the youth • Emphasize behavior changes over developing mutual trust and respect

In the model shown in figure 1 , mentor relationships can affect outcomes through three interconnected processes: social-emotional, cognitive and identity development (paths *b, c* and *d*). Also, through positive social-emotional development, mentoring can impact how youth interact in other relationships with their peers and family. Various individual, family and contextual factors can influence how mentor relationships develop and how they influence outcomes through developmental pathways (*g* arrows).

Figure 1. Model of youth mentoring: Close, enduring mentoring relationships influence youth outcomes through social/emotional, cognitive, and identity development(12).



Only one mentoring program, Across Ages, has been labeled a “model program” on the Substance Abuse and Mental Health Services Administration’s National Registry

of Evidence-based Programs and Practices. Across Ages pairs youth aged 10-13 years with mentors aged 50 or older. It has achieved its status by incorporating many of the best practices outlined above including rigorous screening, 10 hours of prematch training, match durations that greatly surpass the national average, pre-match training of youth, community service projects, structured activities and goal setting and ongoing mentor supervision, training and support(7).

Program evaluations

A paucity of literature exists on evaluations of mentoring programs. The evaluations that have been completed vary widely on the methodology used and outcomes measured. Most mentoring programs target "at risk" youth, which is generally defined as youth engaging in risky behavior or living in risky environments that "increase the likelihood of adverse psychological, social and health consequences"(13). Behavioral risk includes early sexual activity, truancy, tobacco, alcohol or drug use, gang involvement, etc. Environmental risk includes poverty, dangerous neighborhoods, family dysfunction, ethnic/racial minority, etc (2, 13). Most reviews found some positive benefits of mentoring programs though the magnitude of effects were often small, and some benefits manifested through indirect pathways. This section will discuss the evaluations in order of strongest methodology from randomized evaluations to descriptive longitudinal studies.

The most recent randomized-controlled study was the impact evaluation of the U.S. Department of Education's student mentoring program that funded local

organizations to implement school based mentoring targeting at-risk youth in grades 4-8 (2). The study randomly assigned students to receive program services (intervention group n=1,271) or not to receive services (control group n=1,301). Interestingly, the control group were free to seek community mentoring services. The study estimated the impact after one school year (mentor pairs met 4.4 times a month for an hour for 5.8 months) on three outcome domains: interpersonal relationships and personal responsibility, academic achievement and engagement, and high-risk or delinquent behavior. They utilized school records and pre and post student surveys. They did not find any statistically significant differences in the outcomes measured between the intervention and control group. They did find some gender differences, where the program improved academic outcomes for girls with statistically significant positive impacts on self-reported scholastic efficacy and school bonding for girls in the intervention group compared to the control group. The program negatively affected positive social behavior for boys compared to girls, and it improved truancy rates for children younger than 12 years old, but not older children(2).

The results of this study seem to be discouraging, but there are several weaknesses in the design that could have masked positive outcomes. The study included 32 different organizations who were funded by the U.S. Department of Education, and thus the implementation of the mentoring programs were not uniform nor did they all employ the same level of best practices for mentoring programs. About 20% of the mentors were high school students, and though 96% of mentors received training and 94% received ongoing support(2), not much research has been done on the ideal age or

maturity level of mentors. Perhaps the greatest weakness is the length of the mentor relationship, less than 6 months that may not have been long enough to produce the desired results.

Karcher also performed a randomized evaluation on school-based mentoring that included 516 predominantly Latino students aged 10-18 years across 19 schools who were randomized to receive supportive services alone from a youth development agency (n=264) or supportive services plus school-based mentoring (SBM, n=252). SBM typically entails an adult mentor meeting with a student at school for an hour every week. In contrast, community based mentoring typically meet for 4-8 hours weekly. In this study, the SBM component was brief (on average 8 meetings), in part due to barriers in retaining mentors(14). Karcher states that key outcomes that SBM can target include grades, school connectedness and positive behavioral and emotional youth development. He proposed that academic and psychosocial outcomes are interrelated such that improvement in one arena facilitates improvement in the other. SBM may also influence self-esteem, social skills, social support, hopefulness and mattering, where a person feels like they are important to others(14). The study revealed small, but positive effects on self-reported self-esteem, connectedness to peers and perceived social support from friends. It also found that elementary boys and high school girls received the most benefit from mentoring plus supportive services(14). However, the increase in self-esteem may not be related to academic engagement or future-oriented thinking as there were no effects measured on these indices, and some research suggests that “peer-referenced self-esteem can be predictive of increased problem behaviors” (14). In contrast, elementary

boys exhibited improvements in empathy and cooperation, which can predict academic engagement and improved interpersonal relationships(14). Of note, high school boys demonstrated no positive effects of SBM and in fact showed a decline in connectedness to teachers(14). This raises the question of who benefits most from having a mentor, and results from his study again emphasize the importance of programmatic infrastructure and duration of the mentor relationship in order to maximize outcomes.

Rhodes et al randomized 1,138 youth who applied to BBBSA in 1992 and 1993 to either a treatment group or a control group of youth placed on a waiting list for post-study match. Of the youth enrolled, 85% completed both the baseline survey and survey administered 18 months later (treatment group n=487, control group n=472). The study was designed to test a conceptual model of how mentoring programs affected academic outcomes. The study found that mentoring did not have any direct effects on youth's global self-worth, school value or grades, but did have direct effects on youth's parental relationships, perceived scholastic competence and school attendance. Mentoring had several indirect effects on school value and grades that were mediated through improved parental relationships and perceived scholastic competence. The authors hypothesized that the lack of effect on global self-worth could be due to the nature of self-concept that requires a longer duration of the mentor relationship to manifest a change(12).

Thompson and Kelly utilized a less rigorous methodology with a quasi-experimental design with a non-random assignment to the treatment (n=12) and control (n=13) groups. This study only included primarily caucasian boys aged 9 to 15 involved in BBBSA who were considered at-risk by virtue of living in a single parent home and

one additional risk factor that included poverty, truancy, tobacco, drug or alcohol use, family history of domestic violence or substance abuse, academic problems, etc. The study used an individually administered standardized achievement instrument that assessed reading, math, spelling and a composite score. There were significant differences in the composite, reading and math scores between the treatment and control group ($p<0.05$), but no difference in the spelling scores(13). The generalizability of these results are limited by its non-random assignment of groups, small sample size, and lack of female and minority participants. It also failed to account for possible confounding factors such as age, socio-economic status and other support.

Goldner and Mayseless sought to investigate the associations between the qualities of mentoring relationships, closeness, unrealistic expectations and dependency, and youth adjustment using reports from youth, teachers and mentors, over an 8 month period(8). They evaluated *Perach,* Israeli's largest national mentoring program that pairs disadvantaged youth with university students who receive a small grant. They included students aged 8-13 years from 6 elementary schools in a low socio-economic neighborhood served by *Perach* (n=84 who completed both pre and post surveys). The program serves elementary school students from 2nd-6th grade during the academic year, about 8 months, for 4 hours each week. Students took a survey on social support at Time 1 (start of mentoring) and took the same survey on social support at Time 2 (end of mentoring), as well as additional surveys on their network of relationships and a retrospective inventory on mentoring contribution. Mentors completed a scale on student-teacher relationship at Time 2, and teachers completed scales on school adjustment and

teacher-child rating at Time 1 and 2. Measures included closeness and dependency (reported by mentors), closeness and unrealistic expectations (reported by students), academic, social and emotional adjustment (reported by teachers), social support (reported by students), and mentoring contribution to learning, social support and well-being (reported by students)(8).

They found that closeness as reported by students was significantly associated with mentoring contribution to learning ($r=.39$; $p<0.001$), social support ($r=.56$; $p<0.001$) and well-being ($r=.73$; $p<0.001$). Likewise, unrealistic expectations as reported by students was also significantly associated with mentoring contribution to learning, social support and wellbeing. Closeness as reported by mentors was significantly associated with teachers' reports on a change in academic functioning ($r=.25$; $p<0.05$). Interestingly, dependency as reported by mentors was also positively associated with mentoring contribution to social support and well-being(8). The strengths of this study include its longitudinal nature with two data time points, and multiple reports from students, mentors and teachers that provide a wide perspective. However, they could not determine causality, only associations, and potential confounders were not discussed.

Two largely descriptive evaluations of mentoring programs associated with medical schools and universities similar to the Pipeline program exist in the literature. The Health Professions Partnership Initiative at Medical College of GA was created in 1996 and incorporates a Health Science Learning Academy (HSLA) that targets high school students (initially 2 schools) in Augusta starting in 9th grade. They met for 3 hours on 18 Saturdays during the school year. The goal was to strengthen students' educational

backgrounds and interest in professional careers. As of 2002, 203 students have participated and of the 38 who completed all four years of the program, all have enrolled in college. The mean SAT for students enrolled in the program was 1,066 compared to 923 for all college-bound students in participating schools(15).

The Stanford Medical Youth Science Program (SMYSP) is a pipeline program that "seeks to diversity the health professions by providing academic enrichment in the medical sciences and college admission support to very low income high school students"(16). Starting in 1988, 24 students from over 250 California high schools were recruited to participate in this 5-week summer program led by undergraduate students. The majority of students are minorities with about a third Latino, a fifth African American and 4% Native American. The components of the program include spending time in the classroom, anatomy lab, hospital, doing research projects and receiving college admissions advice. Since its inception, 405 students have completed the program with 96% of them followed for up to 18 years after their participation. All of the students graduated from high school, 99% were admitted to college, 81% earned a college degree and 52% are attending or have graduated from medical or graduate school, with 44.4% engaged in the health professions(16). The program attributes its success to its components of direct exposure and participation in the sciences, strong mentoring, college admission preparation and career guidance. Of note, the core participation in the program occurs over a 5-week period, but long-term support is extended to the students in terms of letters of recommendation, assistance in identifying scholarships and apprenticeships, career guidance and personal support(16).

Overall, the literature supports modest effects of mentoring on youth outcomes, and these are largely dependent on the use of best practices and sound program infrastructure. Literature also suggests that mentoring may have many indirect effects mediated through improving parental relationships and perceived scholastic competence. The importance of quality and enduring mentor relationships is a recurring theme throughout the literature. Finally, examples from medical pipeline programs demonstrate the benefits of programs with a focus on the health sciences.

Broader context

The discussion of mentoring programs raises the question of how they fit into the broader context health, education and economics and begs the question of whether they are worth the investment. Moodie and Fisher sought to answer this question by evaluating the Big Brothers Big Sisters Melbourne program, which targeted vulnerable youth aged 10-14 years living in Melbourne, Australia in 2004(17). They performed a threshold analysis based on U.S. estimates of costs associated with high-risk youth dropouts who grow up to become adult criminals. They found that if the program server 2,208 of the most vulnerable youth, then it would cost 39.5 million Australian dollars. They assumed that 50% of these youth were high-risk, which would translate to an adult criminality cost of 3.3 billion Australian dollars. In order to "break even," the program would need to prevent high-risk behavior in only 1.3% (14/1,104) participants(17). In other words, mentoring programs are a low-cost intervention that can help prevent the high costs to society of adult criminality and substance abuse.

In a similar vein, the National Poverty Center published a policy brief on the relationship of education on health. Data was analyzed from the National Health Interview Survey with respondents aged 25 years or older. In general, better educated people have lower morbidity and mortality rates than less educated people. For example, an additional four years of education after high school lowers the 5-year mortality rate by 1.8 percentage points, and more education reduces the risk of heart disease by 2.2 percentage points(18). The relationship between education and health is complex and beyond the scope of this paper. However, it is safe to assume that if mentoring programs can have an impact on improving education and college matriculation, then they can potential have indirect benefits on health.

Pipeline Program

The Pipeline Program at Emory University School of Medicine was started in 2007 by medical students and most closely aligns with the risk and resilience perspective embedded in a selective prevention framework. Pipeline targets youth enrolled in an urban public school, with predominantly African American participants. Pipeline is similar to school-based mentoring programs in that it runs during the school year, is partnered with a high school and mentors meet weekly with students for 3-4 hours engaged in program activities. It is distinct from most SBM in that it has specific curricula and activities that students engage in, and the program is designed to maintain mentor relationships for three academic school years, approximately 19 months total.

Mentors are recruited from undergraduate students interested in medicine or other

health science careers, who apply to become mentors and undergo a screening and selection process. Mentors undergo some training prior to being matched, and then some additional training throughout the program that focuses on the different problem-based learning cases that students work through in the program. The goal of the Pipeline program is twofold. First, its goal is to engage high school students with medical and public health topics through problem-based learning. Second, to provide mentors and role models to high school students that will provide a "pipeline" to higher education. Sophomore Emory undergraduate students serve as individual mentors for sophomore high school students from a local public school, and they maintain the relationship for the remaining three years in the program. The mentors help facilitate individual learning and provide support as the students navigate through the sessions. The high school students come to Emory each week and engage in problem-based learning cases led by Emory medical students. Each year the program has different curricula on public health issues and students build on skills and knowledge acquired in the previous year, while strengthening their mentoring relationships.

The purpose of this study is to examine the high school students' perspective on the Pipeline program and generate recommendations for the program in order to maximize the potential benefits.

Chapter 3: Methods

Pipeline Program

The Emory University School of Medicine Pipeline Program was created by two second-year medical students with the support of the Dean of students and the office of Multicultural Student Affairs. The central purpose of the Pipeline program is to expose minority high school students to the medical field, as they are currently underrepresented in the health professions. The hope is that the Pipeline program will ultimately help begin a pipeline of minorities into the medical education, health and science careers. The Pipeline program aims to 1) foster deep mentoring relationships between the high school and college students, 2) expose students to issues in public health and different careers in the medical field, 3) develop students' skills in research, presentation and peer education, and 4) stimulate the desire, motivation and appropriate tools needed for the students to seek higher education beyond high school. The goal of Pipeline is to improve academic achievement amongst minority student now and in their higher education in order to ultimately improve the health outcomes of low-income, underserved students and their communities.

The Pipeline program is unique in its three-tiered mentorship design where sophomore high school students from a local urban public school are individually paired with a sophomore Emory undergraduate mentor who is interested in entering the health sciences field (medicine, nursing etc.), and they help students work through cases. The goal is for the mentors to serve as role models and follow the students for the next three years through the Pipeline program. Medical students both design the curriculum and

lead the teaching sessions. The high school students come to Emory University each week and engage in problem-based learning (PBL) cases around medical topics, led by Emory University medical students, and the undergraduate mentors provide students with individual assistance with these assignments. Each high school cohort or grade engages in different curricula on public health issues and medical cases, for example chronic diseases like cardiovascular disease. Students build on skills and knowledge acquired in the previous year, while strengthening their mentorship relationships. The sophomore cohort engages in an 'Infectious Disease and Reproductive Health' curriculum where they work through a PBL case involving a teen with newly diagnosed HIV infection. Students work through a differential diagnosis and research different sexually transmitted diseases. Their final project involves filming a video aimed at teaching their peers about the importance of safe sex, as well as a group presentation on a research topic. The junior cohort works through a Neurology curriculum and their final project entails expanding their research and presentation skills with a research topic of their choice. Finally, the senior cohort learns about cardiovascular disease and diabetes in their Preventable Diseases curriculum. Their final project is to design and implement a health fair for their school.

Study Participants

The study participants for the qualitative data is limited to the sophomore cohort of high school students as they represent a naive cohort of students who have not been exposed to the program prior to the study. Participants range in age from 16-17 with the

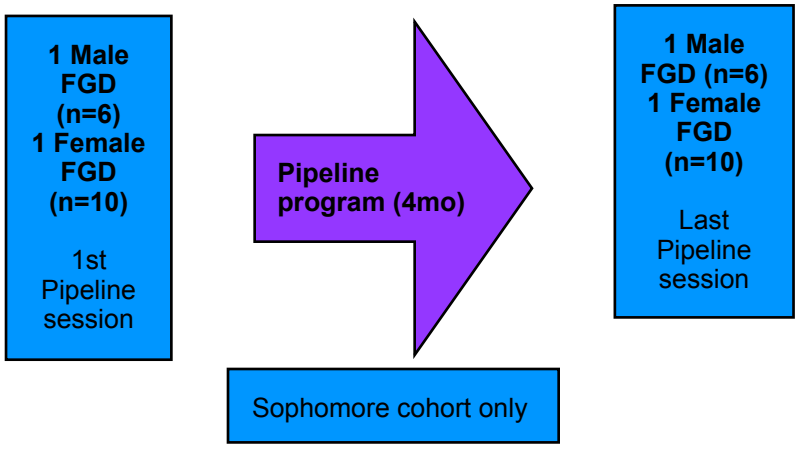
majority being female (62.5%). All participants were recruited at an information session during a Pipeline meeting where the study purpose and design were explained, and how the participants would participate. Participation in the study was completely voluntary and participants did not receive and rewards for participation or any penalties for refusing to participate. Students were given consent and assent forms to fill out with their parents if they chose to participate. All of the sophomore students attended the information session and all of them agreed to participate. An evaluation of the impact on the undergraduate mentors and medical students is beyond the scope of this study, but likewise deserves attention in future studies.

Ethics approval was sought from the Emory Institutional Review Board, and was designated as exempt. Approval was also received from the local public school department of Research, Planning and Accountability, with the endorsement of the principal of the school.

Research Design

The longitudinal study design for the sophomore cohort comprised of data taken from two time points: a focus group discussion (FGD) taken at the beginning of the program year in January, and a FGD taken at the end of the program year in April as shown in figure 2. Only sophomores participated in the FGDs. This design ensured that comparison data is generated from baseline data and end-line data, and will allow assessment of changes after the sophomore students' first year in the program. This design was chosen to capture participant's perceptions of the program over time.

Figure 2. Quasi-Experimental Design for Program Assessment



Qualitative methods were utilized to capture the unique perspectives of the sophomore high school students in their first year of the program. Focus group discussions (FGDs) explored the students' perspectives on the Pipeline program, their mentors and academic performance. FGDs were chosen because adolescents may be more comfortable articulating their opinions in a group of their peers as opposed to individually in single interviews. The groups also allowed the participants to feed off each other, bounce ideas and opinions around and allow for more depth and breadth in the discussions.

Students participated in a male (N=6) or female (N=10) baseline FGD and endpoint FGD at Emory University; the same students participated in the baseline and endpoint FGD. The female FGDs were moderated by women and the male FGD were moderated by men. All moderators have worked intimately with the Pipeline program as teachers, curriculum developers or as program coordinators, however, none of the moderators had met or worked with the current sophomore cohort prior to the FGDs. Nonetheless, their involvement in the program could color how they moderated the FGD

and potentially bias the data. Some of the moderators asked questions that deviated slightly from the FGD guide based on their own opinions. For example in the first girls' FGD the moderator commented how she thought the students were learning things they were not exposed to at school, and she asked if the girls felt the same way. The Principle Investigator and Faculty advisor developed a focus group discussion guide that covers the topic areas of the Pipeline program ("What are your expectations for the Pipeline program?"; "What were the best and worst things about the Pipeline program?"), mentorship ("What are the benefits of having a mentor?"; "What makes a good mentor?") and academic achievement ("Why is it important to do well in school?"; "Where can your performance in school now, lead you in the future?"). Data was recorded using a digital recorder that the moderator placed in the middle of the table, with participants seated around.

Data Analysis

The number of participants for the FGDs was dependent on the sophomore cohort size. However, the breadth of the different perspectives recruited allowed meaningful depth of information to be achieved in the qualitative data, especially considering that the main study population was homogenous and thus the small number of participants enabled the study to reach saturation of information for the qualitative data. In other words, the data answered the research questions and generated important themes relevant to the topic.

Grounded theory was used to guide qualitative data analysis. Qualitative data was transcribed verbatim from digital recordings of the focus group discussions. The transcripts were de-identified, removing all names and personal information, and then uploaded to MAXqda10. MAXqda10 was used to manipulate the data, annotating and labeling codes. Codes were created by grouping similar concepts or themes in the data. Deductive codes were created based on the FGD guide and derived from some of the questions asked and how they were answered. Inductive codes were created from the participants discussions of new concepts not contained in the guide. Codes were used to search the data and develop thick descriptions of the different dimensions or aspects of the codes in terms of contextual meaning, how they were discussed (emotions, expressions) and who most frequently discussed them (girls or boys). These in turn were grouped into three categories based on the topic headings in the FGD guide: 1)Pipeline program, 2) Mentor relationship and 3) Academic performance. Each code or theme addressed one or more of these categories, and within codes comparisons were made between male and female perspectives and baseline and endpoint perspectives.

Limitations and delimitations

The short exposure time for the sophomore cohort may weaken the measurable effect of the program. Likewise, the lack of baseline and end-line data for the junior and senior cohorts, and the lack of a control group diminishes the robustness of the findings and makes them vulnerable to confounders. Finally, the study is limited to one specific

mentoring program, therefore, the findings may only be applicable to this particular program, though themes from the research may be relevant to similar mentoring programs.

Chapter 4: Results

Pipeline Program

The core findings of the qualitative data address the research questions regarding the high school students' perceptions of the Pipeline program, perceptions of their mentors and their academic performance in the first year of the program. Regarding the Pipeline program, students reveal three core findings. First, they recognize a potential long-term benefit of participation in the program in terms of exposure to a college campus and exposure to the medical field. Second, they were not sure what to expect from the program and expressed ignorance about what the program entailed prior to starting. Third, they express fatigue and waning enthusiasm as the program progressed.

Both male and female participants define long-term benefits as those that help them get into college and into the medical field. For example, gaining college experience, providing a positive addition to their resume or college application, and gaining exposure to the medical field. They describe the benefit of college experience in terms of gaining exposure to a college environment by spending time on campus, and learning things that college students learn. They wish that they could have more exposure to college life like shadowing their mentor to a class to get a better sense of college student life as this would help prepare them in terms of what to expect. The boys mention that they had a tour of the college campus and saw the dorms and cafeteria, but they wish they could have seen more of the classrooms and the hospitals on campus because they want to see exactly what they would be getting into when they go to college and enter the medical

field. Thus far they have only heard about what college and being in the medical field is all about, but they have never seen or experienced those environments.

Both girls and boys think the program will benefit them in the long-term because it will be a good resume builder, and make them more competitive on their applications to college. They see the Pipeline program as an experience that may help them get into a better college. A few girls express doubt about this impact because they know of only a few states that have similar programs and are unsure how well-known the program is and whether people would recognize its value. Girls stated that having the Pipeline program on their resume is only beneficial if people recognize it as a worthwhile program. Boys and girls also identify Emory University as one of their dream schools, and think the exposure will help their application. A few girls think that participating in Pipeline will automatically make them eligible for a scholarship if they were accepted into Emory. However, they view the requirements for admission to Emory as "preposterous," so high that it is beyond their reach. The girls recognize their participation in Pipeline as an investment that may or may not bear fruit. They feel that if they do not get into college, then they will have wasted their time in Pipeline, for example: "What if you apply for Emory [University] and you don't get in, so it's like you did Emory Pipeline for no reason" (girl in FGD 3). The girls especially give voice to the sentiment that they are in the Pipeline program because it is something that will benefit them in the long-term, but not necessarily because it is fun.

Pipeline participants, both boys and girls, are also challenged by the work load expected of them for the Pipeline program on top of their homework for school. The boys

think it will be good practice for how their work load will increase in college. The Pipeline sessions and the research required of them for homework seem to simulate what they will be expected to do in college. The boys especially talk about how being in the Pipeline program is like college in terms of the classes and structure. They think that if they can learn a lot in Pipeline then it will make the transition to college easier. The boys express the idea that they are learning things in Pipeline that they are not exposed to in high school, and when prompted the girls endorse a similar sentiment, however they are not as impressed with what they are learning. The girls say they are just learning about HIV and prevention of sexually transmitted diseases, some of the same things they have learned in sex education at high school.

Both boys and girls express desires to explore careers in the health sciences and think the Pipeline program will give them practical or "hands on" experience in the medical field. They cannot articulate very well what kind of experience they are hoping for, but they think the program will give them an idea of what it is like to be a nurse or doctor for example: "I expect [the Pipeline program] to help me get a feel for my future career and what I want to do and support my decision" (girl in FGD 3). However, the girls express a disconnect between what they do in Pipeline and how it will help them in the medical field for example "There's more to being a nurse or a doctor and wanting to major in health or something like that than just talking about sex and STD's" (girl in FGD 3). In some ways they feel that the curriculum was abstract and they do not appreciate how learning about safe sex and HIV will help them get into college or give them exposure to the medical field.

The students were not sure what to expect from the program and expressed ignorance about what the program entailed prior to starting. Many of the students had heard about Pipeline from friends in the year ahead of them who participated in Pipeline last year. Many of them also had siblings who also participated and they generally heard good things about the program, for example how “cool” it was and that you learn about health information. However, they heard little concrete information about the program and during the focus groups at the beginning of the year, both boys and girls had many questions about the program regarding their mentors, what they will learn and do in the program etc. They expressed ignorance about the overall goal of Pipeline and many of the details. For example, they did not know how the sessions were structured or the different curricula for each year in the program or the purpose of their mentors.

The participants expressed fatigue and waning enthusiasm as the year progressed. Initially, the girls were very excited and thought the Pipeline program would be fun and interesting. However, by the end of the year they were tired and felt it wasn’t fun or exciting anymore. The girls feel like the curriculum is very repetitive and that they learn the same thing every week. They think the subject matter is redundant for example : “All we talk about is sex [laughter] all the time.” They are frustrated that all they talk about is sex and HIV and how to prevent it. They cannot see a connection between what they are learning and how it will help them in the medical field, and they think there is more to being a doctor or nurse than sex education.

Girls and boys both feel that Pipeline was just another extension of school. It is just an extra-long day where they have someone talking at them. They really enjoy the

"hands on activities," where they participate in interactive sessions. For example, in the suture lab they learned how to stitch up cuts in pig's feet using surgical techniques taught by one of the surgeons from the surgery department. They also really enjoyed the simulation lab where they used an animated dummy and computer technology to simulate a clinical encounter with a patient. They feel that these experiences are really "hands on" and they are excited to learn and do things that a medical professional would learn and do.

One of the main criticisms that both boys and girls have is that the structure of the Pipeline sessions are always the same. They come to Emory, eat and then break up into their small groups, but they remain in a classroom environment. In contrast, they really enjoy activities that break up the routine. For example they played a jeopardy game where they were in teams and answered questions about things they have learned in a jeopardy-style game. They also really enjoyed their final project where they made videos aimed at teaching their peers about the signs and symptoms of HIV infection and how to prevent transmission. The girls discuss the video with a lot of laughter because some of the videos were funny and they enjoyed acting and dressing up. They feel like Pipeline "kinda tricked us," because it started out really interesting with the simulation lab, but then most of the sessions focus on classroom learning the same things over and over again. Both boys and girls want to get out of the classroom environment and they wish they could do more interactive activities.

Mentors

Regarding their mentors, students describe various summary findings. They recognize time as a key element necessary to form a quality relationship with their mentor. They describe their relationships with their mentors and how they would like the relationship to develop. They expressed opinions on ideal mentor characteristics and how these may translate into benefits for students.

The participants truly value their time with their mentors and see them as integral to the Pipeline experience. Some of the girls think there would be no point in coming to Pipeline if the mentors are not there. During sessions when the mentors are not there, they are disappointed and think it was a waste of time to come. At the same time, they wish they had more time with their mentors during the sessions, that their mentors could play a larger role sometimes in leading a session as opposed to having the medical students lead all the sessions. Some girls think they do not have enough time to get to know their mentors during the sessions because they are too busy learning other things.

Girls especially were excited to learn that their mentors would be with them through to their graduation in the pipeline program (three years), because they know it will take time to allow a mentoring relationship to develop. They feel like some of the mentors "be trying too hard," almost as if they are trying to force a relationship. They can also recognize whether a mentor is engaged or disengaged with them and measured their sincerity by how "distant" the mentor was for example : "I just don't want there to be distance, 'cause if it's distant we're just going to end up walking away from [the relationship], it's not going to change anything" (girl in FGD 1). Boys and girls also

express interest in spending more time with their mentors outside of the Pipeline sessions. They think that if they can spend more time with their mentors doing fun things, then they will get to know each other better. For example, if the students could do a community service project with the mentors, it would make it easier to form authentic relationships that are not just about school or Pipeline, but would allow them to genuinely "learn" each other. In other words, they consider a good mentor to be someone who really makes an effort to get to know them personally, an effort that goes beyond just talking about school or the Pipeline program.

Girls make distinctions on where the majority of contact with mentors takes place. For example, a poor mentor relationship is one where the students only interact with their mentors during Pipeline sessions. In contrast, a good mentor relationship is one where students interact with their mentors on other days of the week also, outside of scheduled Pipeline sessions. For those whose mentors only interact with them within Pipeline sessions, the students do not derive much benefit from the relationship. They feel that the relationship is only about Pipeline and does not develop into anything deeper. Some girls have interactions with their mentor outside the Pipeline program either through phone calls, email or on Facebook. These students feel their relationship is more relaxed, they feel comfortable talking with their mentor about anything and they express ownership of their mentor as if the relationship is something special.

Some of the boys make a similar distinction regarding poor or good mentor relationships. They define their relationship with their mentors as either only professional, which is limited to mentorship in the Pipeline program, or also as a

friendship if the depth of their interaction moves beyond school or Pipeline. Some boys experience both a professional and friendly relationship with their mentors where they will actually talk about things in their lives. Most boys however only experience a professional relationship with their mentors where their only interactions are within Pipeline. They do not talk much, their conversations are more superficial and all business. This is very similar to the girls' experience.

The students express the desire to be known by their mentors and form deeper relationships that can develop naturally over time. They identify a couple barriers to fostering meaningful relationships. First, both boys and girls say that they lacked adequate time to get to know their mentors within the Pipeline sessions as previously discussed. The girls discuss with laughter and exasperation how some of the mentors try to force the relationship too quickly. They think that some of the mentors are too enthusiastic, where they try to force instant bonds: "My mentor be trying to hard with it. I be like just [laughter], it's like she try to make that relationship when it's just supposed to be... not naturally there, but over some time it will get there" (girl in FGD 3). They also express desire for time with their mentors outside of Pipeline, and they suggest doing a community project with their mentors, shadowing them to their classes for a day or having a fun game day with mentors against students.

Second, the girls identify communication as a barrier. Some of the girls especially think that they are so different from their mentors in terms of different backgrounds, interests and race that they have nothing to talk about. One girl mentions how her mentor is vegetarian and she does not know how to relate to her; she feels bad when she eats her

meat sub sandwich next to her mentor and they are just sitting there with nothing to talk about. They describe “awkward silences” and feeling bored and uncomfortable with nothing to talk about except school: “My mentor [sighs], the only thing I didn’t like about her is just, the only thing we talked about was school, school, school. You know I get bored of the same thing and then if we don’t talk about school it’s just awkward silence and I hate awkward silence.” The girls want their mentors to have engaging personalities that will help overcome their differences and prevent boredom. Students and mentors complete a questionnaire about their interests prior to being matched by gender, and attempts are made to match them by interests also. When one of the girls complained to her teacher about how different she was from her mentor he explained that it would be a good experience for her because she will need to learn to interact with different people in college and in the workforce.

The participants also express opinions on ideal mentor characteristics and how they may translate into benefits for the students. The girls especially want their mentors to “learn” them, meaning to really get to know them as people, find out everything they can about them, their likes and dislikes, their aspirations and eventually the difficult things in their lives that may be barriers to achieving their goals. They recognize that they are very different and that the learning goes both ways: “I got [a mentor] that’s different from me. I gotta learn her and she gotta learn me” (girl in FGD 3). They want their mentors to make concerted efforts to get to know them because it shows that the mentors are genuine and invested. Some girls say they will not take any advice that their mentors give if they do not know them as a person because “it’s not going to be for real.” They

can tell the difference between a person who just spouts rhetoric because it sounds good as opposed to someone who really cares and takes the time to delve beneath the surface.

The boys also see mentors as people who model behavior in terms of their work ethic and accomplishments. Most of the boys are impressed by how hard their mentors work in college and feel challenged to emulate them, especially when they consider that their mentors are taking the time to be with them in the Pipeline program. Many of them want to go to college and feel encouraged that their mentors could make it to college, so they should be able to also if they work hard. They see their mentors as people to look up to, but in order to have credibility the mentors need to be competent and engender confidence and respect. The girls also say that mentors need to have good leadership skills and be able to "stand on their own" in order to be qualified to offer advice: "In order for you to be able to lead somebody else into the right path you have to be able to lead yourself" (boy in FGD 4).

Both boys and girls think the main benefit to having a mentor is having someone who has experienced some of the things the students want to experience, namely getting into college. However, not many of the students actually discuss how to get into college or how to manage the workload with their mentors. The mentors do not share their life experiences or provide suggestions for how the students can achieve their goals.

A few girls and many boys see their mentors as a source of support in terms of school or personal life. One boy really loves his mentor because his mentor is good at explaining the concepts they are learning so that he can understand them: "The great thing about having a mentor is that you can call them whenever you need advice or

something and like school-wise or family, then they'll be there to help you" (boy in FGD 2). The level of support is dependent on the depth of communication and the relationship students have with their mentors. Again, if their interactions are limited to Pipeline then they do not enjoy this benefit of having a mentor. On the other hand, if students feel comfortable talking with their mentor then they can experience this benefit: "I talk to my mentor, and I think it's beneficial 'cause it's just like another person to support you and get you through" (girl in FGD 3).

Academic performance

Finally, regarding academic performance, the students identified three core concepts. First, most of the students have clear aspirations, yet have no clear concept of how to achieve them. Second, they recognize that success requires hard work, and they grapple with how to balance the work required in different spheres of their lives with the limited time they have after school. Third, they equate achieving a good education with the ability to make more money and get a better job in the future.

Most students express desires to enter into the health sciences field as a pediatrician, neurosurgeon, obstetrician, pharmacist, physical therapist or veterinarian. However, few of them have any clear idea of how to get there beyond going to college. The students think the Pipeline program is a good experience and a resume-builder, and they love the exposure it gives them to Emory University, but beyond that they cannot articulate how it will help them achieve their aspirations.

The students also recognize that success requires hard work, but they grapple with how to balance the work required in different spheres of their lives with the limited time they have after school when they need to do homework for school and the Pipeline program, and also have chores at home and other extra-curricular activities. Both boys and girls think their workload doubled between school-work, their chores at home and the work required for Pipeline and they see it as a balancing act. The boys think it is good practice for college in terms of taking responsibility for managing their time and being responsible for completing their work. The girls see it as a challenge that will either "make or break [them]," where some students will rise to the challenge and flourish, and some students will just be buried under work: "I be tired like I got an all-day job." The girls recognize that not everybody knows how to manage time efficiently, and say they will either learn to manage time well or not. Especially at the end of the school year, many girls are frustrated and torn because they think they are missing out on school activities to be at Pipeline. At the end of the year they have graduation exams looming and Pipeline sessions conflict with tutoring sessions being held after school.

Finally, the participants equate achieving a good education with the ability to make more money and get a better job in the future. Both boys and girls recognize that doing well in school and making good grades now have implications for their future: "Your grades can determine where you go" (girl in FGD 1). At the same time, the girls articulate that doing well in school is not just about getting all A's, but more about challenging themselves to find their limits and then push past them. Both boys and girls say that there are alternative routes to success than just academics, for example sports or

the entertainment business. At the same time, both boys and girls acknowledge that doing poorly in school leads people into a "black hole" with limited options like working at McDonald's. The boys also identify a poor education as limiting the amount of money they can make and hampering their ability to support their families.

Summary

Boys and girls in the Pipeline program have similar opinions about the program, mentors and academic performance. However, boys and girls do differ in some key opinions. Both boys and girls think the Pipeline program will help build their resume, may help them get into a better college, and provide them with exposure to the medical field. However, girls expressed skepticism about whether the Pipeline program is well-known enough to be recognized as impressive on a resume. They are also not as optimistic about whether their investment in the Pipeline program will yield desirable results, for example getting admitted to Emory University. The girls also expressed a disconnect between what they were learning in the program and how it would help them in the medical field.

One of the main criticisms of both boys and girls is that they think that the Pipeline program became an extension of school, just more work on top of work and "stuck in the classroom environment." The girls especially think that the curriculum is very repetitive and the talk about the same thinks every week. Both boys and girls really enjoy when the routine is broken up with interactive activities.

One of the main strengths of the program that both boys and girls identify is their mentors. Both boys and girls value their time with their mentors and enjoy the fact that they will be paired with them for the duration of the Pipeline program, about two and a half years. However, both boys and girls wish they could spend more time with their mentors both during Pipeline sessions and apart from them doing fun things that do not necessarily involve school or the program. Some girls have a difficult time relating to their mentors and feel awkward because they do not have much to talk about, and some girls think their mentors try to force an instant relationship instead of allowing it to develop naturally.

Both boys and girls made similar distinctions between a good mentor relationship and a poor relationship, where the former mentor makes the effort to interact with the students outside of the scheduled Pipeline sessions, not just during them. The girls really want their mentors to make concerted efforts to get to know them, and see their efforts as a measure of the mentors' sincerity and genuine interest. They would be more inclined to heed their mentor's advice if they think their mentor actually knows them. The boys view their mentors as people who model good behavior in terms of their work ethic and accomplishments. They feel encouraged and challenged to emulate them because the boys think if their mentors can get into college and do well, then they can too. One of the flaws in communication that the boys raise is that they do not talk with their mentors about how they got into college or the strategies they use to be successful.

Overall, the girls seem to be more skeptical of how the Pipeline program will benefit them. The boys are more optimistic and view the hard work required in the

program as a challenge and something that will help prepare them for college. In contrast, the girls view the hard work as something that will either "make or break" them. Both boys and girls are unclear about the overall goals or objectives of the program. They both express desires to enter into the medical field, but have little concrete knowledge of the steps needed to get there. They both also recognize the value of a good education and making good grades now because they have implications for their future opportunities in terms of getting a good job and making good money.

Chapter 5: Discussion, Conclusion and Recommendations

One of the main strengths of the Pipeline program is its mentorship component, and participants valued their time with their mentors and appreciate that the duration of the relationship will span the two and a half years they participate in the program. Participants wish for more frequent interactions with their mentors that are not necessarily limited to the scheduled Pipeline sessions. This emphasis on the duration of the mentor relationship and frequency of contact is consistent with the best practices described by DuBois et al and Randolph and Johnson. They found that the most effective mentoring programs are designed to foster relationships that last at least a year with contact occurring at least once a week(6, 9). Pipeline participants interact with their mentors once a week during scheduled sessions, but since the main focus of these interactions is not relationship-building, perhaps they would benefit from contact outside of these sessions. Interactions outside of the sessions do not need to be elaborate, but may comprise simple telephone calls or the Pipeline program could arrange for the participants and mentors to engage in a community service project together or a fun field day with games once or twice a year.

Both boys and girls describe characteristics of effective mentors that are similar to those described by Sipe, namely that they take the time to really get to know their mentees and work on building trust in order to give advice that mentees are receptive to (11). One of the criticisms that the girls express is that some of the mentors try too hard to build instant connections, and some of the girls find it difficult to relate to their mentors

because they are so different and have little in common to talk about. In fact, there is no significant difference between the frequency of contact and duration of the relationship between same-race or cross-race mentor relationships, and cross-race relationships are just as likely to form positive relationships(11). In this case, mentor training prior to the match is critical to ensure that mentors are equipped to engage mentees of different backgrounds and foster common ground from which they can relate to each other. Sipe contends that the onus must be on the mentor to be proactive and take responsibility for initiating and fostering the relationship(11).

Both boys and girls had many questions about the program in the beginning, and were unsure how their mentors worked, the structure of the sessions and what they would be doing. This ambiguity can be dangerous because if participants' expectations for the program are not grounded in reality they can be disappointed and frustrated with the program. Both boys and girls express waning enthusiasm and fatigue as the program progressed, they describe Pipeline as an extension of school. The girls especially think the curriculum is repetitive and describe a disconnect between what they are learning and how it will help them in the medical field. While the content of the curriculum is important and should be stimulating and engaging, perhaps participants are unaware of the purpose behind the curriculum and structure. For example, students work through problem-based learning cases where they are given a problem and have to work through it to come to a solution. This is designed to simulate critical thinking and medical decision making that health professionals use to solve problems.

Randolph and Johnson emphasize the importance of a clear framework from which to organize a program(9). The goals and objectives of the Pipeline program need to be articulated to the participants. Clear objectives will help inform their expectations so they can more easily determine if their expectations are met. Objectives will also give meaning and purpose to the way Pipeline is structured so participants will not have to guess how the program is teaching them to think like a medical professional.

Both boys and girls recognize that Pipeline demands a lot of hard work, and they are having to balance their school work with work for Pipeline, as well as their home life. The boys view the hard work as a challenge and good practice for college. In contrast, the girls think the hard work will either make them stronger and they will rise to the challenge, or it will break them and they will succumb to the work and not be able to keep up. Their attitude seems almost defeatist, like they see no way out. The Pipeline program could help by incorporating tools to manage time and the increased work load into the curriculum. Managing time and finding ways to balance work with leisure activities is an invaluable skill because as they continue their education the work will only get harder and their time more limited.

One of the main benefits that students expect to receive from the Pipeline program is college exposure and they think it may help them get into a better college. The boys look up to their mentors and feel encouraged that if their mentors can get into college and do well, then they should be able to also if they work hard. However, they do not talk with their mentors about the strategies they used to get into college or how they manage the work. The girls are more skeptical that the Pipeline program will help them

get into college, and if they do not get into college then they think they will have wasted their time participating in the program. College preparation and advice is one component that is missing from the Pipeline program. The Stanford Medical Youth Science Program is a similar pipeline program which has incorporated college admission preparation, help with identifying scholarships and career guidance into their program with promising results(16). Perhaps the Pipeline program would benefit from including some college preparation, for example a writing workshop to help students start their college essays, or advice for what they can do now to strengthen their application. In the same vein, most of the Pipeline participants aspire to become a health science professional, but they lack clear direction of how to get there and the steps necessary. Students would benefit from career advice and a "road map" that details the different paths they can take to achieve their goals. Incorporating college preparation and career advice are especially important for the program because they are important to the participants and thus are a good way to engage them.

Implications

The implications of this research for the Pipeline program are threefold. First, the program needs to maximize its mentorship component as it is identified as one of its strengths. Second, the program would benefit from clear objectives that will allow the organization and structure of the program to have meaning and purpose that is known to the participants and everyone involved in the program. Third, the program needs to ensure that it is meeting the expressed needs of the participants, and not just engaging in

its own agenda. A summary of recommendations for the Pipeline program is outlined in table 3.

Table 3. Recommendations for the Pipeline program
• Facilitate and encourage contact between mentors and mentees outside of scheduled sessions
• Train mentors on what is expected of them and how to communicate and foster relationships with mentees who may be from a different background
• Establish clear goals and objectives for the program
• Incorporate tools to manage time and the increased work load for the participants
• Incorporate college preparation into the curriculum
• Incorporate career advice and a “road map”

Study Limitations

One of the main limitations of the study is the lack of a control group from which to compare results. The study also lacks objective data to measure the effect of the program. Numerous studies have found that mentoring programs do not have a large magnitude of effect on grades and do not necessarily directly impact academic performance. They can however have an indirect effect through increasing students’ connectedness at school, enhancing familial relationships and connections with the community(9, 12, 14). One area for further research would be to explore whether the Pipeline program has any impact on students’ relationships with their family, community and at school.

The scope of this study was limited to the sophomore cohort of students in their first year of the program. Further research is necessary to follow these students as they progress through the program and expand the scope to include the perspectives of all

three cohorts (sophomore, junior and senior). The perspectives of the undergraduate mentors and medical students should also be explored.

Conclusion

Overall, the Pipeline program has incorporated several best practices. The students recognize the mentorship component as one of the program's strengths, and they value the time they spend with their mentors. One of the strengths of the program's design is that mentors remain with their mentees for at least two and a half years, the duration of the program. The frequency of contact is at least once a week, but students also desire to have contact with their mentors outside of the scheduled sessions.

Another area for improvement is the communication of the program's goals and objectives so that participants have a clear idea of why the program is structured the way it is. Better communication will also inform their expectations for how the program will benefit them, and allow the participants to critically examine if the program has achieved its objectives. In the same vein, it is important for programs like the Pipeline program to meet the expressed needs of the participants and not just follow its own agenda. Most of the participants hope that the program will help them get into college and prepare them for rigorous academic pursuits.

Finally, further research is needed to explore the perspectives of the other players involved in the program from the undergraduate mentors, to the medical students. Additionally, the program should incorporate ongoing evaluation of the program and

most importantly follow the current cohort of sophomore high school students and subsequent cohorts as they progress through the program and beyond.

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Appendix A

Focus Group Discussion Guide
Emory Pipeline Program
1st Year (Sophomore) Men or Women's, at the beginning of the year groups

Introduction:

Hi everyone, I would like to thank you all for coming this afternoon. My name is ____, I'm a student here at Emory and I'm evaluating the Pipeline program as part of my work at the School of Public Health. You're all here so that we can pick your brains about your expectations for the Pipeline program this year. During the course of the next few weeks we will be talking to similar groups like you, but with students in different years in the program and both male and female. The purpose of these different groups is so that we can gather a wide range of your experiences with the Pipeline program, your mentors, small groups and activities in the program and how your perspectives may have changed over your years in the program. Towards the end of the year I'll come back and we'll talk about how the year went.

You are all familiar with how small groups work, and this will be similar, where we will respect everyone's opinion and not talk over each other. I want to stress that this is a safe environment where we respect each other's contributions and keep whatever is said here inside this room. Participation in this group is voluntary, so if you prefer to not be a part of this discussion you are completely free to leave. However, everyone here has a unique perspective and I value your opinions and contribution and hope you will stay to share them. I would like to say that there are no right or wrong answers so please feel comfortable to say what you really think. Feel free to agree or disagree with someone else and share your own view, but please also respect the views of others. For the sake of the recording, please do not talk over each other, but feel free to chime in whenever you have something to say or want to respond to someone else's point.

During the discussion, _____ will be taking notes and reminding me if I forget to ask something. However, so that he/she does not have to worry about writing every word we would also like your permission to digitally record the whole discussion. The reason for the recording is so that we don't miss anything that is said and so that the rest of the research team who are not here can also hear your views exactly. Please do not be concerned about this. Our discussion will remain completely confidential; we will use only first names in the discussion the information will only be used for this research project and the recording will be securely stored so that it is not accessible to anyone outside the research team. Is it OK with everyone to record this discussion? (Check that all consent to recording). This discussion will last about an hour. Please help yourselves to the refreshments provided. Are there any questions before we start?

Warm-up/Introduction questions:

1. You all know each other, but let's begin by introducing yourselves and say who your favorite music artist is
2. Can y'all tell me about how you first heard about the Pipeline program? (Probe: how was it advertised?)

First, I would like to start with your opinion of the Pipeline program:

Topic 1: Pipeline Program

3. What are your expectations for the Pipeline program? (Probe: what will you learn, acquired skills, challenges, time commitment)
4. How do your families view the program?
5. How do your classmates not in the program feel about it?

Now, I would like to discuss your views on mentorship:

Topic 2: Mentorship

6. In your opinion, what are the benefits of having a mentor?
7. Please give me some examples of mentors you have had in your lives? (Probe: coaches, teachers, ministers, family members etc)
8. What made them good mentors?
9. What do you expect your relationship with your mentor to be like in the Pipeline program? (Probe: communication, reliable source of information, influence, challenges)

Finally, I would like to talk about your opinions on school:

Topic 3: Academic achievement

10. Do you think it is important to do well in school? Why?
11. Where do you think doing well in school can take you in your future?
12. What about if you do poorly, where does that lead your future?
13. How do you think the program will influence your achievements in school and beyond?

Closing questions:

14. We're coming to the end of our discussion, but first I want to get your opinion on the big picture. What do y'all want to do with your lives after high school?
15. How do you think the Pipeline program will help you achieve your goals? (Probe: exposure to careers, resume builder, challenging experiences, skills)
16. Does anyone have anything they didn't get a chance to say or would like to add a comment?

Thank you all very much for your participation in this discussion, your experiences and opinions are very valuable and will help make the Pipeline program even better.

Appendix B

Focus Group Discussion Guide
Emory Pipeline Program
1st Year (Sophomore) Men or Women's, at the end of the program year groups

Introduction:

Hi everyone, I would like to thank you all for coming this afternoon. I'm ____ and you might remember me from the beginning of the year. Well I'm back again to find out what happened in your first year in the Pipeline program. You're all here so that we can pick your brains about your experiences with the Pipeline program this year.

You are all familiar with how small groups work, and this will be similar, where we will respect everyone's opinion and not talk over each other. I want to stress that this is a safe environment where we respect each other's contributions and keep whatever is said here inside this room. Participation in this group is voluntary, so if you prefer to not be a part of this discussion you are completely free to leave. However, everyone here has a unique perspective and I value your opinions and contribution and hope you will stay to share them. I would like to say that there are no right or wrong answers so please feel comfortable to say what you really think. Feel free to agree or disagree with someone else and share your own view, but please also respect the views of others. For the sake of the recording, please do not talk over each other, but feel free to chime in whenever you have something to say or want to respond to someone else's point.

During the discussion, _____ will be taking notes and reminding me if I forget to ask something. However, so that he/she does not have to worry about writing every word we would also like your permission to digitally record the whole discussion. The reason for the recording is so that we don't miss anything that is said and so that the rest of the research team who are not here can also hear your views exactly. Please do not be concerned about this. Our discussion will remain completely confidential; we will use only first names in the discussion the information will only be used for this research project and the recording will be securely stored so that it is not accessible to anyone outside the research team. Is it OK with everyone to record this discussion? (Check that all consent to recording). This discussion will last about an hour. Please help yourselves to the refreshments provided. Are there any questions before we start?

Warm-up/Introduction questions:

1. You all know each other, but let's begin by introducing yourselves and say who your favorite music artist is.
2. Can y'all think back to when you had first heard about the Pipeline program and tell me how you felt about the program? (Probe: excited, scared, hopeful, no expectations, why)
3. How does that compare to how you feel about it now?

First, I would like to talk about your experiences in the Pipeline program:

Topic 1: Pipeline Program

4. What were the best things that happened in the Pipeline program? (Probe: what excited you, made you want to come back, what made it good, who made it good)
5. What were the worst things about the program? (Probe: what you disliked, made you not want to come, examples, detail)

Now, I would like to discuss your experiences with mentorship:

Topic 2: Mentorship

6. What did you do with your mentor this year? (Probe: what did you like/dislike about it?)
8. How has having a mentor benefited you this year?
9. I would like you to describe your relationships with your mentors. (Probe: examples, details, communication)
10. What did you not like about your relationship with your mentor?

Finally, I would like to talk about your opinions on school:

Topic 3: Academic achievement

11. How have your attitudes towards doing well in school changed since you've been in the program?
12. Can you give me examples of experiences you've had in the program that show you where doing well in school can take you?
13. Can you give me examples of how the program has influenced you in school and beyond?

Closing questions:

14. We're coming to the end of our discussion, but first I want to get your opinion on the big picture. How has the past year in the Pipeline program changed what you want to do with your lives after high school?
15. How do you think the Pipeline program has helped you on the road to achieving your goals?
16. You have all finished 1 year of the program, if you had 5 minutes, what would you like to say to the director of the program? (Probe: what worked/didn't work, what it has meant in their lives i.e. its value)
17. Would you encourage other students to apply to the Pipeline program? Why?
18. Does anyone have anything they didn't get a chance to say or would like to add a comment?

Thank you all very much for your participation in this discussion, your experiences and opinions are very valuable and will help make the Pipeline program even better.

Appendix C: Codebook

Code	Type	Description	Example
College/ medical experience	Deductive	Experience refers to exposure to medical fields and to a college environment, learning things they wouldn't in school and experiencing how college may be including practical experience or skills that may be applied in the future. For example, "give me a lot of experience," "get a feel for my future career," "show us how it will be in a college setting"	*It will give me medical experience; show us how college will be like*
"Hands on activities"	Inductive	Hands on refers to "hands on activities," activities where participants can be actively engaged doing something, not just sitting and listening. For example, anything with "hands on," any activity described, "engaged"	*[I liked] shooting that little movie thing, it was funny; when you have a lot of hands on activities it helps you figure out what you want to do*

Code	Type	Description	Example
Future benefits	Inductive	Future refers to delayed benefits that participants may receive in the future. For example, “look good on college application,” future aspirations/ goals, scholarships, “future-wise,” “beneficial,” resume builder	*It will look good on my college application or resume*
Communication with mentors	Inductive	Communication refers to how mentors and participants relate to each other, how they communicate and the level of conversations. For example, superficial vs deep, professional/ school-related vs friendship/contact outside program including modes of communication (email, facebook, text, in-person)	*We just talk inside pipeline*
Time with mentors	Inductive	Time refers to how much time mentors spend with participants to develop relationships.	*We should be close by graduation*
Mentor Characteristics	Deductive	Mentor characteristics refers to how participants perceived mentors. What makes them a good or bad mentor	*Like a lot of patience; bad attitudes*

Code	Type	Description	Example
Mentor benefits	Deductive	Help refers to how mentors help participants or benefit them. For example "help understand," "encourage," inspire, motivate	*The great thing about having a mentor is that like you can call them whenever like you need advice or something*
"Learn me"	*In vivo*	"Learn me" refers to how well or the effort mentors make to know the participants, includes the desire to be known	*I gotta learn her and she gotta learn me*
Natural mentor relationship	Inductive	Natural mentor relationship refers to the ease/difficulty with which mentors interact with participants. For example, in their conversations, "awkward silence," "natural," "force it" "talk about anything"	*You know I get bored of the same thing and then if we don't talk about school it's just awkward silence and I hate awkward silence*
Platform of influence	Inductive	Platform of influence refers to the characteristics that allow or inhibit mentors to speak into the lives of the participants	*I don't want my mentor to tell me something if they don't know me as a person cause it'll feel like it's not for real*
Academic performance	Deductive	Any discussion on how academic/school performance can impact students' future or where it will lead them in life. Includes poor and good academic performance	Your grades can determine where you go

Code	Type	Description	Example
Work/time balance	Inductive	Work refers to balance of school work and pipeline work, includes sentiments of overwhelming workload, pipeline as extension of school, just another classroom	*in school they often give us work, so work on top of work equals something that's not right*
Recommendations	Deductive	Recommendations participants provide for improvement. For example, more time with mentors, activities outside of pipeline, engaging curriculum with hands on or practical activities, homework time	*They could try to do more activities*
Natural mentors	Deductive	Natural mentors refers to examples of mentors in participants' lives prior to Pipeline	*Teachers, band director, advisors, mom*
Pipeline as School	Inductive	Pipeline as school refers to discussions of the program as an extension of school, one more thing they have to do	*we stay here for like so many hours and when we get home we're like drained from school and pipeline*
Repetitive curriculum	Inductive	Repetitive curriculum refers to discussion on program sessions as "boring," "repetitive"	*All we do is talk about sex*

Code	Type	Description	Example
Females smarter	Inductive	Females smarter refers to males' discussion or explanation of why there are more females than males in the program	*Girls don't have as many distractions; the smartest people in our class are female*
Ignorance about program	Inductive	Ignorance about program refers to questions participants raised about the program, lack of knowledge about the structure of the program, curriculum and mentors	*So what do our mentors like do for us?*
Expectations for pipeline	Deductive	Expectations for pipeline refers to discussions on participants expectations, hopes for the program and their mentors	*I expect it to be like help me get a feel for my future career and what I want to do and support my decision*
Family/ friends perspectives	Deductive	Family/friends perspectives/opinions about pipeline	*My mama thinks its good.*
Feelings about pipeline	Deductive	Feelings about pipeline refers to discussion about their feelings about the program	*I'm ready to get started; I'm excited; It's boring*
Make or break them	Inductive	Make or break them refers to the overall experience of the pipeline program and how the workload will impact them for the better or worse	*It's either going to help us or it's going to harm us*

Code	Type	Description	Example
Aspirations	Deductive	Aspirations refers to what the participants want to do after high school, their dreams and hopes	*I'm trying to graduate*