2020

How Race, Socioeconomic Status, and Gender Shape Feelings of Competition within the Pre-Med Department at a Small Liberal Arts College

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ABSTRACT

This study aims to understand how students of color navigate feelings of competition in the pre-medical ("pre-med") track at a small liberal arts college. I argue that there are differences in navigational strategies by race, socioeconomic status (SES), and gender. Respondents in my sample (9 women and 6 men) were interviewed for 30 to 60 minutes about their relationships with fellow pre-med students, mentors, alumni, advisors, and professors. The primary findings of this project were that students who are more competitive dominate the culture among pre-med students; less competitive individuals persist through the pre-med track by forming study groups with more collaborative students, cultivating relationships with older students and professors, and gaining hands-on experience through lab work. The extent to which a pre-med student uses these strategies is influenced by their race, SES, and gender. I argue that despite barriers such as marginalization and lack of representation on campus at large, students of color are agents of their pursuits in completing pre-med requirements and develop strategies to succeed against the odds.

ACKNOWLEDGEMENTS

INTRODUCTION

In the United States, getting into medical school is a stressful and competitive endeavor. Even if individuals are qualified, the pathway to medicine is so rigorous and selective that many are turned away from the pursuit entirely. Black and Latinx individuals and those from lower socioeconomic status (SES) are underrepresented in the field of medicine. It is a mission of the American Medical Association to diversify the field and recruit more under-privileged individuals, and it is important to examine this persistence of underrepresentation.[1] Undergraduate education precedes entrance to medical school and whether students persist through a pre-medicine ("pre-med") track can determine whether they apply to medical school. As such, studying an undergraduate pre-med student body can yield analysis of the earlier social dynamics that contribute towards retention of underrepresented groups in medicine.

To understand how social dynamics in undergraduate studies play a role in shaping endurance, I examine students of color along the pre-med track to understand how socioeconomic background, gender, and race influences retention. The heterogeneity of this study's sample will help to examine the differences in social dynamics between Asian, Latinx, Black, and Mixed individuals. The term "pre-med department" refers to the students and the professors that teach classes required for the pre-med track. The classes a student must take to fulfill pre-med requirements are one year of general chemistry, one year of introductory biology, one year of introductory physics, one or two semesters of organic chemistry (taking one semester of chemistry requires taking two semester of regular biochemistry), one semester of medical Biochemistry or one semester of regular biochemistry (if two semesters of organic chemistry is completed), one semester of introductory sociology, one semester of introductory

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[1] https://www.aamc.org/what-we-do/mission-areas/diversity-inclusion

psychology, one semester of an introductory writing class (W-1), one semester of calculus, and one semester of statistics.[2]

This paper argues that whether a student persists or not through the pre-med track is dependent on how they utilize their relationships with professors and advisors. Students who are not familiar with networking with their professors are at a disadvantage compared to their peers with more experience in gaining lab opportunities and gaining advice from college professors and advisors. Lab opportunities and the resulting advantages provided to students has been researched and demonstrates how valuable it can be for a pre-med student to have as an undergraduate (Pascarella, 1980; Pascarella & Terenzini, 1977, 1979; Tinto, 1993). This is confirmed in my research by students who acquired lab positions or internships related to medicine. They explained how their fascination in medicine was bolstered by the experience and increased their confidence to persist through pre-med. Whether a student has the confidence to network in the first place with a professor or advisor is influenced by gender. While men in my sample were more comfortable with talking to professors from the beginning of their experience at Colby, women were more tentative. Asian students who formed meaningful relationships with their professors or advisors revealed ethnic ties that they felt strengthened the relationship. It is necessary to increase representation of Black and Latinx individuals in medicine to ensure that younger aspirers have individuals to look for guidance.

If students do not cultivate meaningful relationships with a professor, they receive general advice based on the experiences they've had with previous students. The intention of professors is to set high expectations and drive higher achievement, so students feel pressure to perform at the same caliber and achieve the same ideal. Without meaningful relationships, it is

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[2] https://www.colby.edu/davisconnects/student-advising/pre-medical-dental-veterinary-health-careers/
"Required Courses"

difficult to receive individualized advice from a professor that can sometimes lead to a research experience or internship. If an individual does not participate in internships or shadowing, they feel as if they are behind and isolated from their peers. I argue that not being able to racially identify with professors is an aspect that hinders an individual's access to enriching experiences such as lab research and personalized advice.

Students scale their competency based on how proficient their peers are with academic material, and their confidence in professional prospects. I argue that motivating students by setting high expectations through exemplifying largely successful students can be a source of pressure and possibly exclusion if a student cannot meet those expectations. Without the verbal and explicit support of older peers who may have shared experience and can offer professional advice, students along the pre-med track may lose sight of what they once saw as their career. It is important to understand how low-income students of color navigate the pre-med track to promote their retention. In the case explicated in this paper, it is important to note that it is a predominantly white liberal arts college. The campus is smaller allowing more proximal relations among the student body and closer relations through accessible clubs which can be a source for underrepresented individuals to find a place of belonging (Reyes 2017).

Programs that work to increase diversity such as Colby Achievement Program for Sciences (CAPS) and QuestBridge came up in the interviews, and it is important to understand how these experiences influence retention of pre-med students of color. QuestBridge is a program where high school students from low-income households apply to get matched with certain colleges that will grant them early admission with a full scholarship. Students who are matched to the same school meet each other and have the potential to form a network and engage on campus. 6 weeks before their freshman year begins, 10 CAPS scholars are invited to

participate in a research experience that will teach laboratory techniques, grant the opportunity to form connections with professors and their peers. Students eligible to apply must have high academic, extracurricular achievement and are an underrepresented minority in the field of STEM. Examining the influence of these programs within the pre-med department can shed light on their efficacy.

      I interviewed 15 students. 9 were women and 6 were men. 12 students identified as pre-med, 2 students were once pre-med and dropped it and 1 student never considered pre-med. I included this student because I was initially interested in studying the social dynamics of STEM students. One white student was included as a point of comparison for me to reflect on potential differences. A more detailed chart shows the participant number, gender preference, what year they graduate, whether they were currently pre-med at the time of interview, and how they characterized their race (Table 1). Most of my respondents identified as Asian or Asian-American. It's important to recognize that most of the students I interviewed chose Colby because they received the most aid. Only a couple of respondents deliberately chose Colby based on the aspects that a liberal arts college has to offer such as small class size and the promise of closer relationships with professors. Even though peers and individuals in administration encourage students to use DavisConnects (the career center) and form relationships with professors, performing these tasks requires strategy and experience which students are not always equipped with upon entering college. In-depth interviews lasting 30-60 minutes were conducted where I asked questions about who they worked with in groups, who their mentors were, and how they used office hours. I also asked about whether they thought their behavior was at all related to their ethnicity or whether they thought that working with peers was at all racialized. I asked about group work and discussion sections within their science classes because

most of the classes listed under pre-med requirements consist of introductory natural sciences, organic chemistry, and biochemistry. I found that feelings of competition were different based on gender, immigrant status, and race. To fully explain these factors, I have divided the kinds of interaction into two categories: classmates (horizontal) and professors and advisors (vertical).

Table 1. Relevant information regarding participants whose transcripts were used in this project.

Participant Number (pronouns)	Year	Pre-med?	Race
1 (she/her/hers)	sophomore	yes	Black
2 (she/her/hers)	sophomore	yes	White
3 (she/her/hers)	junior	yes	Mixed: Turkish-American
4 (he/him/his)	senior	yes	Asian-American
5 (he/him/his)	junior	yes	Asian
6 (she/her/hers)	senior	yes	Black
7 (he/him/his)	junior	yes	Asian-American
8 (he/him/his)	junior	no	Mixed: Latinx/Black
9 (she/her/hers)	junior	yes	Asian
10 (he/him/his)	senior	yes	Asian
11 (he/him/his)	senior	yes	Asian
12 (she/her/hers)	senior	yes	Mixed: White/Filipinx
13 (she/her/hers)	sophomore	yes	Hispanic
14 (she/her/hers)	junior	yes	Asian-American
15 (she/her/hers)	senior	no	African-American

In horizontal relationships, feelings of competition are felt when students don't feel as though they fit into the "typical pre-med crowd" which is influenced by race, socioeconomic class, immigrant status, and gender. This is apparent when students consider themselves an outsider to more "competitive students." Those who designated themselves an outsider to the typical pre-med crowd described the barriers to finding acceptance among other pre-med students. Latinx and Black respondents from low income households with a non-elite high school background feel like they have to prove themselves to defy a stereotype that their peers assume. Asian and Asian-American students share feelings of competition, but didn't necessarily share a similar strategy of over-compensation. Collaborative students who were more likely to feel competition among their peers preferred working with other collaborative individuals. Students

who prefer working alone may not recognize competition because of their lack of interaction among competitive and collaborative group work settings.

Feelings of competition amongst peers is most pronounced during group work. Some of the first experiences that respondents recall about group work is that the first group they worked with was competitive. Students who are not compatible with competitive students are collaborative. Most respondents opt out of competitive environments to find peers that prefer a more collaborative setting. If they find a group of students who share the same feelings of collaboration, they form a study group. Students that initially interact with more competitive and individualistic students feel behind and may not persist through pre-med, but if they find peers who also feel behind compared to their more competitive peers, they can persist together. Since the dominant narrative in pre-med in competition, it can be difficult to find individuals of like-mindedness enabling students to feel behind the standard or insecure about the future.

A student can mitigate their insecurity by participating in professional experiences such as lab research and shadowing. When students are insecure about the amount of experience they have, they express how they "feel behind." I interpret this as feelings of competition because they express how it can feel like a race to gain professional experience and build a resume as a means of increasing the likelihood of getting into medical school. Office hours are when professors' doors are open to their students and so is the opportunity to form a meaningful relationship. However, there is a discrepancy between women and men in how office hours are used and demonstrates a barrier that influences resilience throughout the pre-med track. While men expressed comfort and the friendly nature of office hours, women were more tentative and explained that interacting with a professor during office hours required a solid grasp on the material. If students have not developed strategies for networking or participated in networking

before college, they feel the need to prove themselves by showcasing their knowledge which can often be a reason why women don't go into office hours in the first place.

Students who have the networking ability to talk to professors and advisors are more likely to gain research experience. While men are more comfortable and have this networking experience, women are more tentative to develop relationships. Students who make more inroads at the beginning are more likely to gain research experiences early in their undergraduate years and develop an understanding of whether they want to enter medicine. In terms of competition, gaining security in career pursuits can mitigate the feelings of inadequacy among classmates. The respondents in this project that were more likely to seek out professors early on and with low levels of discomfort were men compared to women. Women who sought to form a relationship with their professors felt compelled to demonstrate their own competency with the material before forming a meaningful relationship. This is one of the barriers to networking that I demonstrate later throughout the paper. Those who form relationships with professors early-on gain access to lab research and are also given individualized advice from professors and advisors. The benefits of personalized advice is that a professor can offer guidance on the physical steps that can shape a student's undergraduate career. This is a very powerful tool that not all students can access. I argue that this is one of the barriers that can determine how well a student persists along the pre-med track. Students without the comfort level to network with their professors are at a disadvantage.

When students do not have a meaningful relationship with a professor or advisor, they can receive advice that is not necessarily the next career step they should take, but the experiences of past students. Although hearing about previous students can be inspiring, the respondents of this study acknowledge how it's not helpful for two reasons. Firstly, the

experiences that professors usually draw from are exceptional students. Although this can be inspirational for students, it can also create a singular image of success -- that to succeed one must go to a prestigious college to achieve a respected career. Secondly, students from low-income backgrounds express how one of their main concerns about medical school is how they're going to pay for it. Professors, who may not be aware of students' financial statuses or how to communicate about such topics, don't necessarily know the next step to mitigate a student's fear about paying for medical school. Students who face financial constraints about medical school do not receive assurance which makes the prospect of medical school a trivial affair. Students of low-income families feel as though they can't fully commit to medical school because of financial constraint. As a result, they try to diversify their resume. To prepare for the case in which they are not financially-equipped after graduating, the students of color in my sample express that they take up a minor or second major to explore other pathways. This does not necessarily indicate a shift in their interest to pursue medical school, but a strategy to mitigate economic insecurity about going to medical school. To compensate for the lack of financial guidance, students may turn to peers that are low-income. Since discussing familial economic affairs is not the easiest to discuss, it can be difficult for students to talk about when they don't have a support network. This is why I argue that having a mentor can be pivotal in shaping the endurance of a pre-med student.

Mentors can be instrumental in supporting a younger pre-med student by encouraging them to persist through the pre-med track and offering advice on how to succeed as a pre-med student. In this case, I signify semi-vertical mentors to be older students or alumni. It is helpful to make connections with older students because they can offer advice on what classes to take, how to study for a class, and previews into professional opportunities. The narrative of an older

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student can be inspiring and can provide strategic assistance to succeed along the pre-med track. Alumni who have obtained employment in a lab or have completed shadowing experiences can offer their insight into the programs and connect students with individuals in the professional sphere. This advice is important because the shared experiences between a student and a mentor can offer encouragement and retain a student's pre-med status. Although the CAPS and QuestBridge programs offer support for students, it starts to fade at the beginning of the academic year. Students of these programs either find different friend groups or the support from faculty isn't as prevalent resulting in a loss of cohesion.

This project sets out to determine what factors mitigate students' insecurities through interactions they have with their professors, mentors, and peers with thorough consideration of their race, SES, and gender. The relationships that students foster with their professors open up the possibility for lab experiences and concrete advice pertaining to the steps a student should take to attain aspirations. Students who engage with their peers are likely to assess their own competency. Students who feel inadequate or do not measure with their peers feel behind, influencing them to reconsider whether they are capable of pursuing pre-med. A close relationship with a professor, alumnus or older student can be a valuable relationship because it enables a student to persist despite the dejection or inadequacy they may feel through validation of their own experiences which can be shared with a peer who perhaps went through the same experience and can offer navigational strategies. I argue that the future isn't inherently unsettling, rather there are students that align with the dominant narrative of cut-throat competition in medicine. However, there are students that do not follow this narrative and develop their own strategies to endure the rigors of pre-med classes at Colby. Students of color who persist and succeed in the pre-med track are those who do group work with classmates who

prefer to collaborate with each other rather than compete, have a strong and consistent

mentorship, and have hands-on experience in professional positions.

CHAPTER 2: LITERATURE REVIEW

Competition in Pre-Med

Although there is work on the general dynamics among student at liberal arts colleges, this paper examines how these dynamics play out for those pursuing pre-medicine. Of the research concerning liberal arts pre-med students, there are a couple of studies that examine the processes of how students persist. Horowitz (2010) examines the goals that students have that motivate them to pursue medicine. She writes, "When college students are asked to describe their achievement goals in their own words, they tend to speak of extrinsic goals rather than social comparison goals." Rather than focusing on the comparisons of grades, students in her study report goals concerned with becoming more knowledgeable. However, she also indicates that "further research is needed to tease out how students distinguish between extrinsic and social comparison goals." According to my respondents, I find that students have different strategies and work with individuals that share the same outlook on medicine. Social comparison is still a factor students consider when they form study groups. As argued by Horowitz, "pre-med students do indeed adopt different goal orientations in different contexts and that the mixture of goal orientations that they adopt is complex and varied" (Horowitz 2010). This paper analyzes the strategies that students develop to persist through pre-med and considers how race, gender, and socioeconomic status intersects. I argue that this can be done by reinforcing their goals through interactions among peers, mentors, advisors, and professors.

It's important to delve deeper than the goals themselves and explore the motives behind those goals. It is possible to understand the actions of students through in-depth interviews to understand how students' experiences shape their perceptions of their own performance and the actions they must take to fulfill their professional aspirations. What about grades makes it their

primary motivation? What social factors are at work that put grades above any other motivator? Previous research has indicated that students are most concerned with grades because it's a means of attaining security rather than affirmation from family. "The higher one goes in the educational system, the further one is removed from one's social roots and the closer one approaches the meritocratic ideal" (Hurst 2018). In other words, when a student attends college, rather than being directly influenced by the desires of their parents, students become more confident in their own personal goals. Similarly in my research, even though students were aware of their parents' wishes, they acknowledged that their personal goals were less about pleasing their parents and more about becoming successful in their own choice of profession. My study will offer a supporting evidence for other mechanisms they employ to succeed in their goals of becoming medical professionals.

Draw of STEM at Liberal Arts School

For pre-med students, most of the requirements to graduate pre-health are of comprised of natural sciences. For this purpose, it is also important to inform about the way STEM classes have been shaped. A closer look into liberal arts chemistry education can uncover the practices of students and faculty in undergraduate science education. This will give insight into what STEM at large can become. Priscilla Laws writes that professors of liberal arts institutions claim the advantages of studying at their small college can be beneficial due to their "smaller classes; an emphasis on teaching, rather than research… laboratory sessions led by faculty rather than graduate students; undergraduate research opportunities; and interdisciplinary courses relating science to social issues" (Laws 1999, 223). However, most of the time, chemistry classes at liberal arts institutions still follow a curriculum that is focused on traditional lectures, exams, and laboratories.

There are efforts for chemistry education reform. A project called The ChemLinks Project initiated by Brock Spencer at Beloit College is a collaboration among over a hundred faculty from more than forty two-year colleges, four-year colleges, and universities, where chemistry knowledge is applied to contemporary conflicts through the completion of modules. This program was developed based on research that shows "students learn best when they build on past experience, relate what they are learning to things that are relevant to them, have direct "hands-on" experience, construct their own knowledge in collaboration with other students and faculty, and communicate their results effectively" (Anthony et al. 1998).[3] As found by Springer et al., "cooperation has favorable effects on achievement and productivity, psychological health and self-esteem, intergroup attitudes, and attitudes toward learning" (Springer et. al. 1999, 23). Liberal arts schools are small and private such that teaching methods can be altered and be made experimental, yet cases of deviation from the traditional form of STEM education are seldom reported within higher education.

The benefits of cooperation have been coupled with a method of teaching science called inquiry-based: where the process of thinking scientifically is emphasized more than memorizing theories, equations, and other scientific concepts. Tobias also argues that collaboration coupled with inquiry-based teaching can be productive in creating a more positive environment for chemistry (Tobias 1992, 26). In a case study conducted by Park Rogers and Abell, the outcomes of Warm Little Planet, where teaching the science of inquiry is prioritized over memorization is examined at the undergraduate level. What they find to be important characteristics of a science curriculum are "(a) an investigation fueled by questions, (b) a process not a product, (c) an approach used in problem solving, (d) a natural way of thinking, (e) skills children instinctively

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[3] If interested in the program: About the Chem Connections Project. 2004. https://wwnorton.com/college/chemistry/chemconnections/modules.html

have, and (f) a bridge connecting the known and the unknown" (Park Rogers and Abell 2008, 605). Although it is possible to implement this type of classroom at the undergraduate level, there is little movement to change the traditional system.

Efficacy of Diversity Initiatives

In light of the rise of diversity initiatives set by higher education institutions, it is important to understand exactly how well these programs work to promote representation of socially disadvantaged individuals. Institutions of undergraduate education have increasingly implemented multiculturalism through diversifying faculty and student body (Nelson Laird & Engberg, 2011; Chun and Evans 2016). In response to the adoption of this initiative, it is necessary to examine the experiences of students that contribute to multiculturalism and whether their professional aspirations are being promoted to ensure that policies are effective in diversifying the professional sphere.

The efficacy of diversity initiatives cannot stop at the admissions office. Research conducted at predominantly white institutions demonstrates that Black and Latinx individuals experience racial discrimination and isolation (Haywood and Sewell 2016; Reyes 2017; Morales 2014). It's important to show how diversity initiatives influence the student body and unpacking how Black and Latinx individuals navigate an academic sphere that is predominantly white. As Chun and Evans write, "The full desegregation of higher education remains a goal rather than a reality in some geographic areas (Feagin et al., 1996)" (Chun and Evans 2016). Although higher education institutions have made it a mission to foster environments of inclusion, increasing "diversity" does not necessarily cultivate a desegregated atmosphere. It is important to examine how students of color integrate into the student body to understand whether they are truly given the opportunity to succeed at the same capacity of their white peers.

Although administration may have the intention to diversify to improve the experience of the student body as a whole, underrepresented students are marginalized and excluded. As Thelin points out, "At the same time the prestigious colleges contribute either by accident or design to sharpening the schisms of privilege within their own campuses. That presidents, trustees and deans at elite colleges and universities commit resources and priorities to equity in admissions, they also perpetuate class distinctions within the campus" (Thelin 2019). Students of color can be subject to overt and covert forms of discrimination. Although there are overtly racist events, more often there are interactions that interfere with the daily-proceedings of a student. "Black students frequently encounter rude stares and avoidance, exclusion from study groups and other campus spaces as well as doubts about their academic ability from non-Black students (Feagin, 1992; Hayes, Cunningham & Courseault, 2006; Solorzano et al., 2000; Solorzano, Allen, & Carroll, 2002)" (Morales 2014). Although there is some research focused on studying the discrimination students of color face on campuses, there is less work on pre-med students of color within liberal arts colleges. To understand the degree to which liberal arts colleges are promoting the mobility of students of color, it is important to examine how they are interacting amongst their peers, professors, advisors, and mentors.

Diversity initiatives have also been shown to benefit the white individuals more than students of color. Chun and Evans write "Diversity-related curricular and co-curricular activities that expanded individuals' content-based knowledge of other groups have a moderate effect on reducing racial bias (Denson, 2009). This study also found that white students tend to benefit more from these diversity-related interventions than minority students (Denson, 2009)" (Chun and Evans 2016). Although liberal arts institutions have the intention of providing an educational and cultural experience for the whole student body, administrators and faculty are not aware of

the micro-interactions and the intricacies of how they shape the environment among students. Reyes has performed ethnographic research among Latinx students at a liberal arts college, a research university, and a regional public university and found that at a liberal arts college: "the racialized organizational setting is characterized by an institutional prioritization of diversity coupled with affluence and privilege among the predominantly White student body. This fosters cooperation and solidarity among Latino students" (Reyes 2017). This study is important because it brings to light the plights of students of color that administration cannot understand from their vantage point.

The means of creating a student body is not entirely dependent on academic capabilities. Admissions looks at the academic background of an applicant, but also demographic indicators: "An American dilemma is that few institutions or organizations rely exclusively on measures of educational talent. Furthermore, no college is wholly an 'academic' institution in its selection and composition" (Thelin 2019). There are two dimensions to take into consideration when studying the dynamics within a college campus. As illustrated by Feagin, "The collision between the macro level of unequal, stratified social structures, and the everyday micro level of student interactions can cause painful experiences of marginalization and dissonance within the campus ecology" (Chun and Evans 2016). Such is the case when initiatives prioritize admissions without having a clear understanding of the interactions that can follow. Increasing representation of less-advantaged individuals is valuable to higher education. However, neglecting the narrative of Latinx and Black students demonstrates weakness in the initiative to promote the retention rate of students of color. This is one of the ways that "institutions have continually created, recreated, and reproduced systems of inequality through normative structures and social networks (Feagin, 2006)" (Chun and Evans 2016). Understanding the efficacy of diversity initiatives requires

examination of interactions among the student body once Black and Latinx students accept admission into a place of higher education.

While "'diversity" has been a major preoccupation of American Higher education since the early 1980s," (Wood 2013) this mission has been pursued without considering the social implications of introducing new demographics of the institution. Throughout this paper, there will be a constant connection between "students having the capacity to shape their interpersonal environment, whereas institutions, in turn, provide the potential for individual transformation" (Chun and Evans 2016). This paper demonstrates how social actors are agents of their environment. Although the administration makes decisions that influence the demographic, it is important to understand how these decisions impact the students. Unearthing the interactions among students who were admitted under the actions of the administration can be means of displaying more effective remedies for marginalization of students of color.

Underrepresentation of Black and Latinx Students in STEM

The pre-med requisites are comprised mostly of STEM classes, so it is important to understand how underrepresented pre-med students navigate this department. Students on the pre-med track are more likely to graduate undergrad with a science degree as well, so they may engage in more upper-division science courses. As such, the strategies Black and Latinx students employ when taking their STEM classes is crucial to understanding how they navigate the pre-med department. Jones et al. point out that "Minorities are seriously underrepresented in science and engineering, yet they are also the most rapidly growing segment of the population" (Jones et al. 2010). Although more underrepresented individuals are being accepted into higher education, this does not necessarily imply that representation in all fields will increase. Research conducted on campuses concerning the experiences of STEM students of color shows how this lack of

representation can result in isolation due to experiences of marginalization and negative racial climate (Johnson 2007). It is important to understand how the lack of representation of Black and Latinx individuals within the pre-med department in undergraduate education can influence retention and representation as medical practitioners. Examination on the dynamics within the pre-med department will shed light on how low-income individuals and Black and Latinx individuals navigate and persist throughout the pre-med track.

Persisting through the pre-med track

College resources such as career advisors, research labs, and mentors can support retention along the pre-med track. Previous studies have shown that lab experiences can grant the opportunity for students to form meaningful relationships and gain confidence in their choice of major (Pascarella, 1980; Pascarella & Terenzini, 1977, 1979; Tinto, 1993). Jones et al. adds that "those that remain longer in research could also be more likely to remain in the major because they are more motivated to begin with or because they have already committed a great deal of time to the major" (Jones et al. 2010). Qualitative research can bring to light the nuances that take place when students persist along the pre-med track. In this project, the motivations behind students' choices to continue along the pre-med track can be brought to light. Respondents of this research reveal the barriers to pursuing pre-med and navigational strategies to overcome these obstacles. By doing in-depth interviews, observed quantitative patterns can be explained through the untangling of social patterns.

Mentors are also influential individuals that can promote persistence in STEM. As reported by Jones et al.:

"Engaged mentors can provide students with information, advice, and guidance and support both generally and at critical decision points. This kind of support helps

undergraduate and graduate students take full advantage of a program and may be the difference between a student completing or leaving a program. At the undergraduate level, helping a student prepare and apply for graduate school can make the difference between whether a minority student continues in the STEM pathway" (Jones et al. 2010). Although there is evidence of mentors working, it is important to examine the mechanisms by which this is possible to develop programs that promote growth of students of color along the pre-med track. This study will focus on the networking abilities of students and how they are influenced by an individual's gender, socioeconomic status, and race.

There has been some work concerning the networking abilities of individuals belonging to lower socioeconomic strata. Anthony Abraham Jack (2016) uncovered how middle class college students and those with an elite secondary education were more likely to form close relations with professors whereas students without an elite background were uncomfortable when interacting with faculty. His study offers the idea that it is important to consider the resources that may not be present at the onset of an individual's family background. There are resources that students cultivate throughout their educational careers that provide them advantages over their peers. This study was conducted under this assumption and will complicate the reasons why students persist through pre-med. This will be taken into account by analyzing the barriers they come to face and the strategies they engage to overcome these obstacles. Through analysis of interactions between students, their professors, mentors, and their peers, this paper aims to understand the processes by which pre-med students keep along the pre-med track.

Understanding how students navigate along these different kinds of interaction will be important when developing policy that works to intervene and promote endurance along the pre-med track for those of disadvantaged backgrounds. It has been established in literature how "race

and gender, cultural stereotypes also play a negative role for some underrepresented individuals in pursuit of science majors and careers" (Li and Jiang 2016). As such, it is crucial to understand how interactions with various social actors in college influence retention of pre-med students to develop action that can respond to these inequalities. Work done by Sanchez (2018) demonstrates how "the parent(s) of several students in [her] sample received post-secondary degrees in their country of origin but currently held lower-paying jobs." This means that some indicators of class reported in quantitative studies may not accurately portray the resources and educational background of an individual.

Researchers studying low income students operate on the assumption that many are at a disadvantage and are subject to defeat because they are not as culturally wealthy as their more affluent peers. Using parental education as an indicator of class background, Hurst asserts that "The more socially prestigious the graduate occupation and the greater the amount of academic capital required for it, the more influence parental education has on matriculation into that program" (Hurst 2018). Although this study demonstrates that parental education is a better indicator of student capital it neglects strategies that low income students of color can develop. In Sanchez's work, she finds that "students drew from aspirational and resistant capital to understand that failing and quitting was not an option because of family and their own expectations and responsibilities." Through this qualitative research project, I analyze the strategies students of color from low income families use to persist through the pre-med field to understand the disproportionate experiences of underrepresented pre-med students. By treating marginalized students as agents of their own professional aspirations, their form of navigation can uncover a greater understanding of the social dynamics at play within the pre-med discipline. Sanchez finds that students "benefited from meeting other minority students and creating a

support system. However, the prejudice and blatant negative stereotypes attached to what it means to come from La Esperanza created a level of stigma based on their race and class that made them feel isolated regardless of the type of institution they attended" (Sanchez 2018). This project aims to understand how marginalization interferes with performance. It's possible that students develop a strategy of resisting the biases of their peers, but by understanding the specific actions of students who experience marginalization, it may perhaps suggest a means of promoting the retention of students of color. Strategies such as gaining laboratory experience are proposed by Jones et al. to support retention of those in science majors. They argue that "introducing students to undergraduate research early on and for an extended period of time are beneficial for the retention and performance of all students, but that underrepresented minorities may have the most to gain from such strategies." (Jones et al. 2010). By examining how students interact with various individuals in a liberal arts school and their barriers, this study uncovers strategies of persistence. Reyes finds that liberal arts college students "come together to form a collective sense of being that focuses on embracing heterogeneity to establish solidarity" (Reyes 2017). By focusing on pre-med students and the different kinds of interactions that can occur within the department, this paper aims to expand research that examines social explanations behind underrepresentation of students of color in medicine.

CHAPTER 3: HORIZONTAL RELATIONSHIPS

When pre-med students form groups with their peers, they develop a perception of the pre-med culture. Oftentimes, students use this framework as a way of predicting what a future in medicine might look like. Many of the experiences that students reported indicate a dominant pre-med culture rooted in competition. Medical schools are incredibly selective, meaning that students are under the pressure of maintaining a high GPA. Since most pre-med prerequisites are under the natural science department, this means that students are under intense pressure to perform well in these rigorous courses. Such intensity is described by respondents as being in graded discussion sections and study groups with competitive individuals. Intensity and high expectations may push a student to perform better. It also demonstrates how a competitive culture of medicine is present at the undergraduate level and can influence students of color disproportionately.

Programs such as QuestBridge, which aims to diversify the student body, and CAPS, which aims to diversify the student body in the sciences, establishes student and professor ties before students come to campus. Students express that the program is beneficial in the beginning, but for some, advising drops off when their freshman year begins. Even if students have a social network and gain access to research opportunities, respondents explain the insecurity they feel. This insecurity stems from not feeling accepted amongst other pre-med students and not having enough lab experience or shadowing in a hospital. As a result, students who experience biased incidences become more independent and learn how to cope with derogatory behavior. A strategy that respondents utilized to bolster their independence was to avoid their peers and forming study groups. Even if they found a study group, Black and Latinx students report having

to overcompensate to avoid being stereotyped by their peers. There is the pressure to uphold the image of not only themselves but their entire race.

Group Work

Students form groups to build off of each other's knowledge, but in some cases, where students are more competitive and individualistic, study sessions can be intense and repel those who are more collaborative-minded. Asian and Asian-American women from this study often reported that their first experience working in a group was with individuals who were more competitive. As a result, they looked for other students to work with. This does not mean that they were completely isolated from competitive individuals. This is one factors that contributes to the persistence of the dominant competitive pre-med culture. Black and Latinx respondents expressed similar experiences of competition, but instead of finding another group, these students often resorted to independent work. There is not the same level of convenience for Black and Latinx students to reach out to other peers because of the lack of representation in the natural science department.

Competitive students have a more individualistic stance on working with their peers. Instead of mutually exchanging knowledge and ideas, competitive individuals are more concerned with their own personal performance. To secure their own futures, competitive pre-med students ensure their success over that of others. Students who are more collaborative distinguish themselves from competitive individuals who they also regard as the "typical pre-med student." Competitive students are individuals that may ask more from their peers than they are willing to give.

> **"Are you premed?** Ummm yeah… I'm prehealth… I'm not really like one of those cutthroat premed people. I don't like to identify that way… **What do you envision when you think cutthroat?** My classmates that have actively gotten their notes from me when they ask…" (3)

Again, it is important to stress that competitive individuals are under pressure to perform well relative to their peers. To secure their own futures, they are willing to take the work of individuals without necessarily reciprocating. When competitive individuals form a study group amongst themselves, they understand the intensity of studying with each other.

> "I wouldn't say we're mean to each other (laugh) but we're all very strong like independent women who wanna do well and study really hard… like we're all in the library until God knows whenever studying. So, we get competitive" (2)

Those that choose to work with other competitive individuals are cognizant of the intensity of their dynamic. In light of how difficult it is to get into medical school, students are compelled to compete with each other because of how hard they work. As a means of showcasing their academic labor, these individuals elect a high pressure environment. This is typically viewed as the dominant pre-med culture by most of the respondents in this study. Students who are more collaborate acknowledge that competitive students may feel the need to demonstrate their own competency to feel secure in their own knowledge:

> "I don't know if it's intentional but it feels like. Trying to like show people like how much they understand and already know. Sometimes it's hard to like talk because everyone is like talking to each other." (9)

Collaborative students feel pressure in a more competitive environment because it's difficult to get concise ideas into the open. There is also the feeling of showcasing the knowledge of an individual rather than coming to a collective understanding of the subject material. By grappling with the material and showcasing comprehension of the material, competitive students can feel secure in their presentation of knowledge. Feeling secure in subject material is an essential part of studying the material. Feeling this validation sometimes means overriding the contributions of other individuals.

> "Instead of telling me her thing she would usurp the whole thing. Or like [this guy] would take the marker away and would say, 'you got this thing wrong!' Erase! I did get a lot of

things wrong, but somehow other people [who weren't competitive] would manage to [correct me] without being rude." (3)

Assertiveness takes the form of taking the marker away from a peer when they're in the middle of explaining how they answered a problem and is perceived as rude. Although this may not be the intention of the more competitive individual, those who do not see competition as a productive means of group work have a negative outlook of this strategy. Collaborative students may not have the inclination to override other individuals because they perceive orderly contribution of ideas to be more productive. Those who do not work well in this environment feel as though they fall short of expectations which breeds their insecurity about continuing to pursue medicine.

Asian, Asian-American, and Mixed students explained how after negative experiences with more competitive peers, they formed different groups with other collaboratively-geared individuals; Black and Latinx students have a more difficult finding other individuals to work with because peers belonging to the same race aren't represented to the same extent as their Asian and white peers. When forming a study group, students explain that it is a matter of convenience. If there is less representation of Black and Latinx students, it is perhaps less convenient to work with other individuals of the same race and perhaps of shared experience:

"They were white. It's just there are so many white people at Colby, we didn't have a lot of POC in general to make groups with…" (3)

At a predominantly white institution, the racial demographic will not have equal composition of race. In STEM classes, where Black and Latinx individuals are underrepresented, it may be difficult to conveniently form groups with individuals of the same ethnic backgrounds. Programs like CAPS provide a student network that individuals can form which perhaps makes it more convenient for individuals to make groups. However, since the class is predominantly white,

when working in a study group, some CAPS Latinx and Black students still feel the pressure to

prove their competency:

> **"I feel like I embody that stereotype [of the Hispanic woman] that I am not as smart as my other peers that maybe went to like better institutions and like, you know, their parents' first language is English, you know, they grew up here… I have that fear that like, you know, like my peers will reject me if I'm not like at par with them,"** (13)

Even if CAPS individuals feel academically competent, they feel that because of their

background they are at a disadvantage. What this student notes as "not being on par" is that her

parents' first language isn't English, they didn't grow up here, and she didn't go to a better

institution. Even if she manages to demonstrate her academic competence, she acknowledges

that there are ascribed characteristics that people look at first to assume her abilities. Individuals

who are cognizant of their minority status feel academically insufficient among their well-

educated and native English speaking peers. Additionally, there is a pattern of condescension and

ignoring the contributions of their efforts:

> "But coming to Colby -- that trend did kind of switch. Kindof where I would say an idea and then my group members would totally ignore it… and I was just like "what the fuckk" and it would take the professor confirming my ideas/saying it in front of the class for them to be like "oh you were right" and that's happened a lot at Colby" (1)

Being ignored by peers and treating their answers as invalid is surprising to peers who have not

grappled with overt racism among their classmates to the extent of being ignored for their

contributions. The students of color who come to Colby and experience being ignored in

academic settings is not necessarily surprising, but is something that they're not used to

experiencing every day. As a response, students of color develop strategies to feel competent

which often means becoming more independent:

> "I kind of developed an approach to labs where I just bulldoze over everyone else because otherwise I don't get listened to you and I know it's frustrating for my partners and I do empathize with that feeling for them but for that class I had a partner and I just took the lead on everything that we did…. if I don't take the lead no one will listen to me….It's like you have to be the loudest voice in the room for anyone to hear you" (6)

Prior experiences working with other students in the lab influence students of color to develop their own strategy to ensure that their participation is included. This often means working harder to make sure that their voice is heard and avoids discrediting. Even though this respondent empathizes with her group members, this strategy is necessary to ensure that she is being heard. In her experience of consistently being ignored by her white peers, it is necessary to use these strategies to feel comfortable and demonstrate her competence. This experience can be compared with the navigational strategy of a younger student who can speak on more recent experiences. When she went to a club meeting to talk about racialized experiences, she found that other students were experiencing similar instances. The feeling of not being alone can be empowering and can evoke a strategic response to being ignored:

> "I think just from knowing that other people felt that way that I wasn't gonna let it get to me. And if they ever ignored me then I would just ignore them right back.. You know? That was the best feeling. It's just so funny because I don't know why I never thought how about... I ignore them and see how they act. And they literally. My group members don't like that... (smiles) yeah so I've been a little more badass now I think" (1)

To compensate for how they are perceived by their peers, students of color feel the need to overcompensate by doing more preparation before a group session or may dominate the group to ensure that their voice is heard. It's important to note that the strategies students develop are not constrained to academic settings. Those who experience constant instances of bias from their peers acknowledge their strategies of coping as a norm:

> "[As a] low-income, first gen, POC like I always kind of have to overcompensate which is kind of sad but um, it's kind of like a norm. I guess that I've become used to" (13)

The need to overcompensate to demonstrate competency among students at a predominantly white institution is one that can become a normal and regular practice for Latinx and Black students. In response to experiences of condescension, students of color become more

independent and do not participate in group work with their peers immediately because of the constant barrage being ignored or doubted.

Although Asian and Asian American women reported similar instances of being doubted, they still felt comfortable reaching out to peers and were inclined to work with other individuals. This is made apparent when a student's first study group experience is with competitive individuals and then switches to a more collaborative environment by joining a different group:

> "We would get it up on the white board. In that explaining process people would get really heated about their opinion and they would grab the marker or take the marker away from that person, and then alter it. That's how that happened" (3).

Students who are more competitive are quick to correct others -- not necessarily out of malign -- but perhaps they are anxious to get to the right answer and showcase their knowledge to feel competent in themselves. Students who don't agree with the style of group work of competitive students recognize that students may be trying to demonstrate their own understanding of the material rather than collaboratively trying to get to common ground with their peers. Once collaborative students find other collaborative individuals to work with, respondents described a more comfortable dynamic:

> " I think in the end like if we have like different ideas like talking about it talking it through and like trying to like come to a consensus where one person really understands like understands the other one or like... You guys come to like an equal understanding of like merging your answers together, I guess" (14)

There is a balance of responsibility that respondents find makes the group work session more efficient. When collaborative students have a strategic method of going through a problem set, it means that everyone needs to have done their part to prepare. In a collaborative work environment, rather than being motivated by their own individual goals, students are motivated to prepare for the session for the sake of others. By preparing material before the work session begins, students can tease out the details of a certain problem and bring attention to questions or

discussion points that are not on other individuals' radars. The study session can also be more productive if students do their share of the work and reach a reciprocal exchange of knowledge:

> "Different people like people have different things that they're unsure about and... [we] try to bridge that gap together and like after you've studied on your own for a long time, you know exactly what you don't know and so like your questions can move quicker." (9)

Collaborative environments have a different type of pressure than competitive environments. While students in competitive environments are under the pressure of doing well for themselves and their own grades, collaborative students have an obligation to their group members to do the problem set beforehand and understand the parts they're confused about. When an individual doesn't prepare and perhaps doesn't have the same collaborative initiative, there is an imbalance in the workload and slows down the collaborative work process:

> "Certain people would like kind of just chill until like one of us got the answer and it was like kind of frustrating because I felt like... Like there wasn't like an equal like pull of the weight and I also felt like sometimes if I was confused on something like people would get kind of frustrated trying to explain it if it just wasn't clicking to me" (14)

Individuals who are aware of the unequal balance within the group express feelings of frustration. The balance is offset by individuals who feel as though they're contributing more than their peers or if they feel as though they are carrying most of the work. The mindsets of the individuals within the group causes trouble, not a gap in knowledge. Although various individuals may be at different levels of understanding, the groups that are more successful are comprised of individuals who have the same strategy concerning group work:

> "they were very unwilling to like diverge from that topic during the discussion… it was pretty frustrating to have that domineering person just take over the whole discussion." (13)

Inability to conform to the procedure of a collaborative study session can be frustrating for those that are familiar. There are high expectations within collaborative groups, and those that are unfamiliar with the dynamic cannot contribute as efficiently. Individuals who are in a group that

is used to sharing intellect with each other recognize that there is an equal share. However, when a more competitive individual joins that group, the motives are different and this is where conflict arises:

> "Ok we heard that our grades for our exam scores were gonna be curved and after that class the person I was working with and a couple of other people created a group study guide. And a couple people pulled out and were like 'I'm not gonna share my intellect with you because it's graded on a curve and so I wanna do better than you.' And we were like … 'ok…' And that was explicitly displayed…" (3)

Sharing intellect is something common in a collaborative setting. However, for competitive individuals, there is a necessity to keep information to themselves to prevent their peers from surpassing them. In this case, the setting of a curve influenced more competitive students to withdraw from their study group. Perhaps they felt as if it was advantageous for them to study on their own to set their own pace. When there is a conflict among individuals about the group work strategy they take, it results in a detraction from the efficiency and progress of the group.

Individuals who do not elect to work with others on assignments or study for tests are not exposed to the rest of the pre-med community. They may not have feelings of competition because they have not engaged with competitive individuals. Although they may prosper working on their own, it's important to recognize that they may not have the opportunity to elect working in a group because of these prior experiences -- experiences that set the tone for how collaborative endeavors may continue down the line. Participants that choose to work by themselves make note of the unbalance that can exist between group members.

> "I feel like I just sort of work at my own pace and I... not to say that like other people can't work at their own paces. I just would prefer to work at my own pace and not really be hindered or rushed by anyone else" (10)

Among the participants I interviewed, most of them depend on group work to check on how their understanding matches up with other individuals. Group work requires finding a pace. It takes work and time to find other individuals that work at the same pace or share the same studying

strategy. There is also the pressure that comes with having an established collaborative group. Those that opt out of finding a group to work with are perhaps more confident in how they learn material, but for those that are not confident in their studying methods and who do not know how to form a productive group, it can be defeating and results in a higher likelihood of dropping the pre-med track. Finding a study group that was more in-line with a collaborative procedure was common amongst Asian and Asian American respondents, but not with Black and Latinx students:

> "I think doing the problem sets for biochem was really positive because I was working with like three other girl or like women and, It was very much it was slow collaborative work to make sure that we understood everything and like… trying to do them on your own not really succeeding and then like everyone coming together and answering them in a more. Like a fuller response" (12)

In collaborative environments, more information is discussed to ensure that there is complete understanding of the material. In competitive environments, since each individual may only be concerned with the topics they're confused about, there may not be coverage of all topics.

The procedure of a study group is dependent on the precedent set by those taking part. In collaborative environments, students attend a study session to work through concepts that they don't completely grasp. In the competitive environments that respondents have talked about, there is more pressure to outperform peers. Students in a collaborative environment set out to assist their peers under the impression that they will be helped in return. There is also the benefit of another individual explaining the answer in a different way that makes it easier to grasp. This type of collaborative effort to fully answer a question is preferred among students that opt out of the more competitive environments they've experienced.

There is a degree of networking required to form a study group. As explained before, students who are underrepresented in STEM can find it difficult to form a study group based on

individuals in their classes, because they may be the only Black or Latinx individual in the classroom. In addition to incidences of bias on the campus at large and the small interactions they endure every day, opting to work as an individual rather than with other pre-med students is one way students of color navigate. The Asian, Asian-American, and Mixed students I interviewed explained how they found their more collaborative group:

> "I would want to do homework with people and study with people because we were all struggling to learn. And so the people who happened to sit next to me. And other people who I kindof knew their names, and so I asked for their number... and we were also lab partners. We'd have a group chat of people who meet regularly and work together." (3)

When there is open demonstration of difficulty with the class material, it can be easier to form groups with individuals. Students who want to form groups with one another often do so to assist in grappling with the material. Upon formation of their first study group, it can be difficult to understand whether a student is competitive or not. At first, students who are more collaborative feel as though they are giving more than receiving. After recognizing the lack of balance among their more competitive peers, they look for a different group that shares a similar collaborative approach to group work:

> "I think in the end like if we have like different ideas like talking about it talking it through and like trying to like come to a consensus where one person really understands like understands the other one or like... You guys come to like an equal understanding of like merging your answers together, I guess" (14)

By forming a group of like-strategy, it is possible to work through the material efficiently. Competitive individuals prefer to work amongst each other because productivity to them is securing their own individual success. Although competitive individuals defend their own solution without means of consensus, what's important is their individual understanding. For those that do not operate this way, it is important to find individuals that have the same perspective on how group work should be carried out. Otherwise, feelings of competition can

motivate feelings of insecurity and feeling behind their peers, when in reality, the approach to their learning is just different and requires a different environment.

At first, when groups are formed out of convenience, it is hard to tell what the group dynamic will be like. After some time, an individual can figure out where they stand on how to work within a group. Of the participants I interviewed, individuals tended to form groups for organic chemistry, biochemistry, and higher division biology classes. Some perceive this notion to form groups specifically to pre-med students since the classes get smaller the higher the level is and it's been a couple of years students have been in the same classes together:

> "I think the fact that I started out taking classes with the exact same people... and we've just been taking exact same classes every semester made it easy for me to like find a community that I can like reach out to and ask questions" (11)

Asian, Asian-American, and Mixed individuals feel comfortable reaching out to their peers because they take classes where their race is represented. For Latinx and Black individuals, the lack of representation can make it difficult to form groups in light of the racial bias they experience everyday:

> "I could not focus on the lecture but I look around me and I was the only black person in my class and I knew I was the only one who was having to deal with this emotional turmoil… On top of trying to learn and get an education, it just felt so unfair to me and it's a very lonely feeling. **Can you recall anything else that's similar to that sort of experience?** Hmm. Well, most of my classes throughout my time here. I've been the only black person in my class, so it's kind of just like a continual experience… that was a more like extreme day. But. It's kind of always in the background there" (6)

Even though some days are worse than others, as a seasoned pre-med student, it is important to pay attention to how isolating it can be to be the only Black or Latinx individual in a pre-med class. This isolation and unfair feeling is something that resides in the consciousness of a Black or Latinx student. To see no one else going through the same experience can deter an individual from reaching out to their peers and forming a network. Asian and Mixed students who are

represented feel comfortable with reaching out to their peers and can reap the benefits of collaborative work.

It's important to establish ties among pre-med students because they can form more meaningful relationships to determine how they work best. Those that enter the pre-med track may be at a disadvantage because they haven't established the same network. This can influence students to feel behind their peers.

> "I thought I came into pre-med pretty late because it seemed like everyone who was pre-med came into college pre-med" (9)

Feelings of competition can be provoked when a student enters later than their peers and feel behind in their coursework. Ensuring that students who are interested in medicine start off early in building their network can feel more secure in their future. In the case of Asian, Asian-American, and Mixed students, Groups that form at the beginning are more likely to be unbalanced and can thereby result in clashing of study strategy. Some individuals opt out of forming a group because it can be frustrating to work with individuals who do not work at the same pace. Even those that persist through group work understand the frustration that stems from domineering individuals or those that take more than give. Individuals of color feel as though they need to overcompensate when interacting with peers because they have experienced instances of condescension. As we have seen, however, even if an individual engages with their peers early-on, Black and Latinx students encounter isolation through lack of representation in the classroom and racial condescension. As a response, students of color overcompensate to prove their competency and become more independent in their classwork to avoid degrading behavior. Even though Black and Latinx pre-med respondents do not participate in collaborative or competitive study groups, they persist. Sometimes, experiencing and bearing witness to racial degradation is a reason to persist through the pre-med track:

> "For me to not finish here is giving in to other people's expectations and I won't let anyone have that satisfaction. **Whose expectations?** Just... People who are surprised when you get a better grade and exam. People who... Assume that you know less than them. Just because you exist in a way that is different than their own. People who are surprised and you have the right answer" (6)

Students of color persist through pre-med as a means of proving doubters wrong. In response to individuals that blatantly ignore them, students who face marginalization at the hands of their peers use independence as a strategy for achievement. For those who prefer studying by themselves, whether or not they study with their peers may hold no bearing on their academic success. However, perhaps there are Black and Latinx individuals who may need a support network of other pre-med students. This network is not readily available, and demonstrates the necessity of diversifying the pre-med department to amplify student engagement with peers.

Discussion Sections

I argue that discussion sections can evoke more competitive responses from individuals. In discussion sections, when participation is graded intensely, there are more displays of overt competition. Respondents acknowledge that discussion sections help in gaining the confidence to present a response under pressure and self-doubt. They explain that it is helpful to have these strategies because they can better prepare for medical school. In structuring a class like this, the competitive culture of pre-med studies is reinforced.

Feelings of competition are heightened in graded discussion sections because students prioritize their individual grade over full comprehension of the material and their performance of competency in front of the professor. When I asked students to describe the dynamic, they recalled how students race to participate to ensure that they get points for that day:

> "I feel like the discussions are just more intense and more like everyone's trying to give their opinion and um everyone's trying to like look good in front of the professor" (14)

The initial dynamic of the discussion is usually described as intense and anxious. Students are vying for points, but also simultaneously looking for the professor's approval. The race, however, to ensure participation credit was also reported to be counter-productive:

> "people would just like raise their hands immediately like one off of the other and ask like like not in a mean way, but just unintelligent questions that were just... sometimes like not even relevant just to get these like participation points" (12)

When students are graded based on participation, students are more individualistic. Rather than promoting the learning of the entire class, individuals may be more interested in their personal performance. It is in these scenarios where students can distinguish themselves between competitive and non-competitive peers. Students who are more competitive will take the ideas of students that they didn't agree with in study groups but use that answer in discussion to gain points. This can be disadvantageous for individuals who are not as eager to raise their hands:

> "I think those are the people that tend to like speak up more and even if you put your idea-- like if you were working in a group, for example and, You are required to participate they will take your idea and kind of run with it and pretend like it was their idea in front of the professor" (14)

Competitive pre-med students in an unbalanced setting, may reject the ideas of another while treating the idea as valuable when it comes down to getting credit for participation.

The power of grades and how students prioritize them is a source of division among pre-med students. Within discussion, students prioritize their personal grade over collaboration with other students. This is not to detract from the grades of anyone else, but rather, to secure their own academic success. Although there are those that are more competitive, there are also individuals that are more collaborative. However, the way discussion sections are carried out follows the dominant narrative of competition within medicine, thereby constructing a cut-throat environment that is more conducive to the individualistic student.

Individuals who do not identify with the typical pre-med crowd primarily express stress around the discussion section. However, they also recognize that it is helpful considering that most of the students are pre-med and this may be the environment they will be subject to in medical school:

> "I kind of have to get over the like fear of like being wrong and for this class specifically like I'm very like… I feel like very anxious in class like I want to do very well in it… So, I think it's like good in that sense and like you never know like you... like I might have the right answer and just be too scared to share it and like if I do share like, then I'm right, you know." (14)

Initially, students elicited negative responses about the stressful environment. However, upon further questioning they recognize that this graded, competitive discussion encourages them to speak up, and be ok with being wrong in front of the professor and other peers. This conversion is interesting because students would relate it to medical school. When taking pre-med classes at Colby, pre-med students start to form an ideology of what studying medicine may look like in the future. Competition at the undergraduate level may prepare students for the competitive environment, but it also may play a part in perpetuating it. Students who persist throughout this competitive environment are more individualistic and may carry that behavior on through medical school.

> "[students participating in discussion] didn't bolster any sort of like knowledge about whatever system we were talking about... and in my head I was like, 'Is this what med school's gonna be? Like, people just asking like unintelligible questions because... Because they feel like they have to?" (12)

It is probably not the intention of the professor to forgo relevant material within the class. Rather, the competitive environment may be created to foster higher stakes for presenting more relevant information. However, according to respondents, students' questions may not always be relevant to the problem set question. To collaborative students, discussion is difficult for them to participate in because their procedure to approaching questions prioritizes the collective

understanding of the group. In a competitive discussion section, students prioritize the grade over comprehension of the concepts.

It is important to recognize how students perceive these discussion sections because they reveal that individuals who do not conform to the typical pre-med crowd may feel isolated in this dimension through different means. The typical, individualistic pre-med student is more likely to succeed in this environment because their strategy of study is geared towards prioritizing their own understanding above others. It is possible that even their questions, while not beneficial for the class are asked for their own purposes. Some students who feel comfortable asking questions because they know that everyone else is equally as confused:

> "whenever I ask a question I feel pretty comfortable because it's like I actually know what you're talking about and I can ask you about it" (1)

Students who are more likely to participate feel comfortable with the material. This means that individuals who may not have a great grasp on the material may not be able to participate. For those preparing for discussion section more individualistically, a discussion that focuses on the individualistic competency of students may bolster this ideology. In more collaborative settings, students can similarly grapple with the content, but perhaps ensures that a larger portion of students in the study group are able to succeed. Collaborative environments are more conducive with assignments such as lab reports:

> "Discussions are more intense and more competitive than group work… Reports like. You're expecting everyone to kind of give their equal share and sometimes it, isn't it That way, um, but it's kind of like a low stakes environment… I feel like the discussions are just more intense and more like everyone's trying to give their opinion and um everyone's trying to like look good in front of the professor" (14)

Some pre-med students may feel as though students are only contributing to impress the professor or prove their competency, some don't feel comfortable speaking on their own. Regardless of how students feel about the discussion, most respondents feel that the discussion

reflects the environment of medical school: highly competitive and individualistic. However, as demonstrated by "non-typical" pre-med students, there are ways of being more collaborative with each other that may benefit in collective success and full comprehension of the subject material.

A collaborative environment can still be intense and requires work to be successful and efficient. Students must find compatible individuals that align with their strategy of approaching various assignments where peers are reliant on each other for doing adequate preparation. Issues can arise because forming a group takes time based on their established network. Even after students form groups from their network it takes time to recognize whether the individuals in the group are compatible. Those that have negative initial experiences working in groups do so because there is an imbalance -- usually expressed by respondents as not feeling heard by their peers or giving more than receiving.

There is no particular strategy that can be deemed good or bad. Competitive and individualistic students who find each other can perhaps thrive. However, since the dominant culture among pre-med students is competitive, collaborative students who work with competitive pre-med students deem that the norm. Students who are unable to find others who have the same strategy may consider themselves behind and not competent enough to keep along the pre-med track. This is also true for underrepresented students who cannot form groups as conveniently as Asian and white students and develop a strategy of independence as a means of navigating their marginalizing environment.

Among the students I interviewed, all students who reported their experiences with discussion related it to future conceptions of medical school. Although students may not find it comfortable, they acknowledged discussion as important to improve their confidence. The

perpetuation of competition in pre-med as the dominant narrative can result in the reproduction of that same environment. This is evident by how students are under the impression that to succeed and attend medical school, it is crucial to speak out despite self-doubt. Although there are those that might argue that students need to be competitive to survive pre-med and medical school following undergraduate work, it can similarly be argued that the individuals who persist also contribute towards creating that environment in medical school and later in medicine. Those who engage as competitive pre-med students contribute towards the cut-throat culture of medical practice -- thereby excluding others that have a different outlook on medicine. I argue that there is an alternative that pre-med students engage in that isn't so competitive. However, when the dominant narrative is one of competition, it can be disheartening for those that don't find a group to fall back on and can result in them dropping the pre-med title.

CHAPTER 4: VERTICAL RELATIONSHIPS

To persist through pre-med, students form meaningful relationships with professors and advisors. Individuals with more networking experience and those who network earlier in the year have a better chance of forming meaningful relationships. Since CAPS scholars are on campus for 6 weeks before the academic year begins, they have the opportunity to form relationships with professors more closely and even obtain a research opportunity. However, once the school year begins, CAPS students may not receive the same amount of attention. For those who do not have prior networking experience, it can be difficult to cultivate relationships with professors to the same extent thereby losing a source of support.

There is a gender discrepancy in how relationships are formed between students and professors. From this sample, men feel more comfortable networking and view entities such as office hours as a chance to befriend a professor while women feel as though they need to prove themselves by demonstrating how well they grapple the material before they can form a relationship. Women pre-med students that I interviewed reported that the expectation to prove academic prowess is one of the reasons they avoid office hours. When a student needs advice and the professor does not know how to deliver with physical steps the student can take, in respondents' experience, they receive recollections of a professor's previous students. While this may inspire students it may also contribute to the dominant pre-med culture of competition.

Students who are remembered by professors and are discussed to offer inspiration are often students who are notably successful. Students admire these alumni, but they can simultaneously feel lost or behind among their peers. Among respondents who reported they were low-income or came to this school because it was the cheapest option, they also expressed their worries about paying for medical school. Professors may not know the details about

finances and medical school admissions. As such, they may not know how to advice a student. The strategies with which a student interacts with professors and advisors contribute to how well they persist through the pre-med track.

Advisors

Pre-med advisors are helpful to those who aspire to attend medical school because they can offer methods of building a resume and organizing events with previous students who attended medical school. It is helpful to reach out to them early in the year to gain an understanding of how pre-med works at Colby and what steps a student should take to secure their future in medicine. Of this sample, more pre-med men reached out earlier because of their level of comfort in networking.

Students who gain early contact with their advisors can often immediately reach out to their network among faculty. Advisors can then offer individuals the student should contact to apply for research positions based on their personal interests:

> "So freshman year, [a pre-med advisor] told me to reach out to all of these professors in the psych department and into biology department who are doing research with things I was interested in. And he connected me to a few of them" (11)

Networking performed earlier in the year can provide a more salient experience for students. The initiative to seek out lab experiences early on makes it more likely for a student to persist through the pre-med track, but it is dependent on one's own prior experience with networking and comfort level with talking to faculty. In this sample, the individuals that reached out to advisors early-on were either men or CAPS students.

CAPS students have the ability to form a relationship with advisors before the academic year begins, but when the school year begins their guidance is not as present. Although some students reach out to their advisors and maintain a relationship, the advice was not always related

to steps they could take to progress through the pre-med track. Within my sample, the advisors that CAPS students had were not as cognizant of the steps a pre-med should take to feel more secure in their professional pursuits:

> "I feel like there could have definitely been more support, more study sessions, definitely more of like Q&A maybe even with like older students, you know, or maybe students that are in med school like grad school, but we kind of just hit like a very stagnant point in the fall" (13)

Although CAPS works to grant low-income students of color an advantage by exposing them to the environment of the science department, close guidance from advisors is curtailed when the academic year begins. For students with minimal experience in networking, it can be difficult to strategize a plan to cultivate relationships with advisors. Although the resources are accessible, students have different levels of comfort when talking to a faculty member. Even if advisors yield results for some students, these results are constrained to individuals who understand how to network and utilize those resources. Within this sample, men were more confident in utilizing their resources while women demonstrated a lack of guidance when reaching out to advisors.

Advisors and class deans can provide emotional comfort when students are distressed about the rigors of medical school and whether they are up to par with their peers. However, students report that this comfort still does not assist them in feeling less anxious. It is important to provide concrete steps that students should take to build their resume and to feel secure in their pursuit of medical school. Students who feel behind their peers seek the council of advisors on what concrete steps can be taken to catch them up, but this requires them to have knowledge on what resources they need themselves. When they express sentiments of feeling behind, they are immediately offered comfort and are sometimes not given steps they can take to gain lab or job experience to add to their resume:

"I thought I came into pre-med pretty late because it seemed like everyone who was pre-med came into college pre-med and so would go to her with my concerns and be like, I'm behind... my GPA isn't high enough and all she would be say is like, 'You're gonna be fine don't worry about it,' which is like good advice to an extent... like I need you to tell me how to do things" (9)

To quell uncertainty, advisors immediately offer reassurance, but this can only help to a certain extent. Students who enter the pre-med track late or do not have networking experience need tasks to help them feel more secure. To navigate the uncertainty, students turn to their own resources such as searching the web. Even when given a task, students who are unfamiliar with applying to certain programs need guidance on what steps they should take to secure a position:

"**did you receive any sort of guidance?** I wouldn't say so. I feel like… I would reach out [and] talk to her and [she] was kind of like 'oh' like 'do some shadowing' but like I didn't really know how to get that process started, um, So, I feel like not as much as I even hoped" (14)

Although students reach out for advice, they are still unsure about the steps necessary to take that would open up shadowing experiences. There is a difference between care and specific pre-med advising. The fear of not being guided towards a specific career is another way of expressing insecurity of the future. Pre-med students, if not exposed to lab research, shadowing experiences, or any sort of medical volunteering are not grounded in physical experiences that rule out or support their career aspirations in medicine. Whether it's class choice, professors, applying for lab work, or applying for summer opportunities, it's important for students to gain confidence in their next step. Knowing what the next steps are and gaining professional experience in the field can influence perception on whether a student truly wants to go into medicine. This can then promote adherence to the pre-med track.

The pre-med men I interviewed demonstrated networking skills based on how they knew how to network with their advisors. Having reached out to the pre-med advisors early in their

undergraduate experience, they demonstrated that speaking to advisors early can cultivate a more meaningful relationship and can also open doors to professors and lab experiences earlier:

> "sort of what drew me here and also the passionate premed advisors … Pre-Med Advisor X was a great mentor and a great figure with regards to sort of pushing me to come here into a small liberal arts school" (10)

Having been drawn to Colby through the pre-med advisors, students can solidify their investment in the medical field. By entering this college with the premonition of following the pre-med track, students can learn what they want to get out of the program and what resources to reach out to. When advisors specifically connect students with certain professors, students can gain earlier access to research opportunities and meaningful connections. By utilizing advisors as part of their network, they can reaffirm their pursuits in medicine through applying for shadowing opportunities and research positions and making connections with professors that are involved with research that piques a students' interests. When a more meaningful relationship is developed between students and advisors, students are more likely to be granted a research experience or guided towards a lab that is of their personal interests.

Forming strong relationships with professors

Forming relationships with professors is disparate among those of different gender, race, and socioeconomic status. It is also dependent on whether a student has developed networking strategies. Relationships with professors can be initiated through office hours or through the CAPS program. Whether a student is capable of cultivating a meaningful relationship with a professors is dependent on their own prior experience of networking. Individuals that make connections earlier in their undergraduate career have a better chance of gaining lab experiences and having the confidence to continue pursuing medicine. There are discrepancies in how a student can receive guidance based on gender and socioeconomic status. This is demonstrated in

the use of office hours, where men are more confident in forming a friendship with a professor and women are more tentative to do so, feeling as though they need to prove their academic competency before they can form a mentorship with a professor. In some cases, this premonition is what discourages women from utilizing office hours. Without forming strong relationships with professors, however, students may not gain access to lab experiences and may not gain the confidence in their pursuit in medicine. Pre-med women of color report that to overcompensate for their tentativeness about forming a friendship with professors, they try to grapple with the subject material to demonstrate an understanding.

In the CAPS program students form relationships with professors before the rest of campus through a 6-week-long orientation in the summer. During this period, there are opportunities to network with different professors. A strong bond between professor and student is promoted because of the proximity and duration (Laws 1999). When the school year begins, however, the professor's attention is not given as often and students must reach out themselves to continue the relationship. If a relationship is cultivated successfully, a student can then do lab research with the professor. This opens up another avenue of resources. In some cases, the professor can be an advocate for the student by making them experts in a certain software or technique to make sure their knowledge is sought out by other students. Professors can also engage students with their colleagues which results in a connection with a professional in the field:

> "[CAPS] definitely like has helped me throughout my time at Colby not necessarily just within my first year... That's how I networked to get my summer job that I've had for three summers at Colby. Yeah, it was helpful so like professors knew me already and kind of knew what to look out for because they knew like my experience level with different material" (15).

While students are able to network on their own accord, professors are also able to understand their students' aspirations more closely. By having individual attention from a professor, a student can ask for more personalized guidance that may bolster their studies and motivation to pursue medicine. This can be useful for underrepresented students outside of the CAPS program. Women of color, especially benefit from forming a strong connection with a professor.

As discussed earlier in horizontal data analysis, women of color report overcompensating in preparation for group study or lab to demonstrate competence among their peers. Professors can be instrumental in the process of uplifting women students of color by providing the tools to become familiar with skills that put them at an advantage above their white counterparts.

> "My research professor knew that I didn't have a lot of experiences experience in like lab and knowledge of those things and I was also like, You know, the only female person of color working in his lab and so what he would do is he would take me aside and make sure that I knew and had an understanding of everything that was going on" (15)

By understanding the resources that a student has and granting them the tools necessary to act as a leader among their peers, a professor has the ability to uplift a woman pre-med student of color. By developing a meaningful relationship from the beginning of the year, students can gain formative experience in the lab and gain confidence in their pursuit of medicine. It is crucial to establish a strong relationship with a professor so they can gauge one's personal interests and background in scientific research.

Professors can also be inspirational to students when they share similar ethnic and gender ties. Coming from similar experiences can tailor advice as to what career choices a student should make.

> "I've been doing research with this like really like coolest like baddest ass… that's like not a phrase... woman who is the I've been working with her for the past three years and she… she's Asian which is cool like just comfort and like I guess motivation-inspiration wise" (12)

The comfort aspects indicates a level of trust with the professor which is influenced by the shared ethnic and gender ties with the student. Seeing an individual of the same race and gender can be inspirational and the advice of that individual can be poignant in times of doubt:

> "[pre-med students] just portray themselves as knowing exactly what they want to do with an exactly set plan. And sound so smart and probably are so smart and then there's like the idea of a pre-med person and I don't think I fit in the idea and then she's been a good reminder or that like I'm also pretty smart I guess and like can do this and want to do this. And like my drive may be different than other people's but it's still like a drive to do it, so" (12)

Students that don't see themselves as typical pre-med students feel behind among their peers. Seeing someone of the same race can inspire students to keep pursuing medicine, and can also remind them explicitly that they are capable. Having a mentor of the same race and gender to reaffirm a student's status as competent and on-track can influence them to endure the rigors of the pre-med track or persevere through times of self-doubt.

> The discrepancy between men and women is present in how ethnic ties are formed.

> "he reminds me of my parents in terms of like his mannerisms and things like that. So he's essentially like an uncle to me like he's just like there is like a father figure… yeah, the [ethnic] connection goes like some ways but I got also best pals with like Chemistry Professor, Pre-Med Advisor,. Colby Faculty who works in Davis Connect, so but yeah, I mean Biology Professor and I hit it off pretty quickly." (10)

Male participants identified one of their mentor professors as a father figure -- suggesting that a familial relationship between professor and student may be more prevalent among men of color. Forming close ties with a professor with multiple years of experience with pre-med students can yield advice on the specific steps a student should take to gain security in their career choice:

> "They know what Colby students are like... they know how pre-meds are like and so one professor might be really encouraging one professor might be... Honest and like tell you not to do a certain things like "thesis is not gonna help you" or "you shouldn't look for jobs like that because it's not gonna get you anywhere" (11).

It is here that we can examine where a relationship yields more than emotional comfort. If a relationship is strong enough, the professor acts more as a guiding mentor -- offering honest advice about the next steps a student should take.

It is imperative to have an older individual to look towards in times of doubt and encourage them to keep driving. If a student genuinely believes that they cannot continue to pursue medicine, it is important to have a strong relationship with a mentor to offer steps that the individual can take to mitigate uncertainty. Forming a relationship with a professor earlier in their undergraduate years can be pivotal in deciding whether medicine is best suited for an individual. Students with stronger relationships can be given more honest advice that spares their feelings and grounds them in the steps required for them to succeed in medical school. The process of grounding a student can also be helpful because it refocuses students on what they need to be doing now for the sake of the future:

> "this other professor was like, you know, you shouldn't have been worrying about getting into med school at this point you should have been worrying about your classes" (14)

Pre-med students can be focused on getting into medical school as early as freshman year. By cultivating a strong relationship with a professor, a pre-med student can be grounded in the steps that they must accomplish in the present before worrying about applying for medical school. Students can be given solid steps through the advice of their professors who challenge the aspirational musings of their students. Meaningful relationships mean that advice is not curtailed to spare the students' feelings.

> "I guess we know each other on that personal level that like... she knows what my interests are. She knows where I would excel and that was just really helpful and would like... Make me come back to reality sometimes... sometimes yeah. I would be... I want to be like striving for something else but then I don't really know the consequences." (11)

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A more meaningful relationship with a professor means that a professor can make very personalized decisions. This does, however, take cultivation on the students' part and requires a a background in networking.

Students who have the confidence in networking strategize their visits, gain more access to lab experiences, and are granted more concrete career advice. By taking solid steps towards determining career aspirations, they can provide stability and certainty. Those who do not have these experiences may not have the same confidence and thereby feel behind their peers. For students who are not comfortable with networking or may not have developed the skill for doing so cannot form valuable relationships with the professor, which means they may not be able to receive the academic assistance they need.

> "most of my visits in the STEM department at office hours is that I've kind of you know, you go in I usually have my materials ready. I have my questions ready and more often than not the professor will answer my question but it kind of stops there' (13)

This is not to say that help from the professor is the only avenue for success in the class. It is important, however, to understand how forming a relationship with a professor through the tools granted through practiced networking can also grant access to asking for help and receiving help from a professor who is more familiar a student's own knowledge and learning capacities. As suggested in the CAPS programming -- the availability of professors enables them to understand how their students learn and can more easily assist them with a particular concept.

> "I really just go and say hi and chat if they're free... things like that just sort of continuing to foster that relationship" (10)

An understanding of networking requires knowing the importance of fostering a relationship and acknowledging it as a continuous process. Students who are confident with networking utilize office hours for the purposes of networking. Sometimes, the material from class can be used to bridge the relationship from classroom topics to more personal matters:

> "Even if I didn't have a question I would still come in before an exam and just be like yeah, so I just kind of show that I know a lot or I know the material but then I would ask like one or two questions just to make sure that they like know who I am. I don't know. I think that makes kind of a difference when you're grading your paper" (11)

Students who utilize office hours to network demonstrate comprehension of the material to ultimately establish connection with the professor. Students who are not as familiar with networking believe that it is necessary to demonstrate competency and grasp of the material to engage with the professor to show that they are worthy of assistance. Although both students with and without a background in networking utilize material from the course to bridge academia to more personal topics, students without the networking confidence feel as though they need to prove their competency with the material. There is a necessity for some students of color to prove that they are deserving of help:

> "You need to show the professor that you care or that you're putting effort in" (5)

Men who are more comfortable with networking use academic material to bridge the conversation whereas women feel the need to prove themselves to show that they're worthy of building a more personal connection:

> "I mean for me personally I kind of... and I think that plays into why I don't go to office hours as much. I like... I feel like if I'm going to office hours I need to know what I'm talking about or know like... [the] subject that we're discussing" (14)

For students that may not know how to network, they may not immediately see the value of using office hours as a means of forming a connection with a professor. Demonstrating competency of the material is a barrier to those who may need the sincere advice from a professor.

Lack of strong relationships with professors

When a relationship between professor and student isn't as strong or hasn't had enough time to grow, students can be tentative to ask for advice. When given advice that isn't so

individualized, the student may not be given steps to take to gain an understanding of their pursuits. In other words, students who do not form a strong relationship with a professor may not be granted the tools to determine their true passions through lab research or professional advice.

To console their students, professors draw on their own previous relationships if they do not have personal knowledge on the steps one can take to ease financial insecurity. However, oftentimes the experiences of previous students that professors draw from are the stories of vastly successful individuals. By recollecting the experiences of the most exemplary students, professors contribute to the dominant narrative of competitive pre-med culture. Rather than emphasizing a multi-faceted pathway to medicine, oftentimes the students who are more high-achieving are set as an example. These students' experiences are then used to console or to inspire a student to keep pursuing medicine, but it also creates a homogeneous image of success. Since more successful students are more likely to stand out, professors bring them up when they recall students who worked with them:

> "Like professors who like I'm glad that their students are doing so well but when they're like constantly talking about like how they're only talking about the students who went to like Yale or Washington University in Saint Louis or like Princeton for medical school it really like… Adds to the pressure of being the best, which I don't think is... Healthy." (9)

This type of interaction -- where exemplar students are showcased by professors -- can be dejecting for a student who is uncertain about her career path. Even if this is not the intention of the professor, feelings of competition are heightened when professors idolize one type of student.

For low income students, seeking advice from professors, even when the relationship is strong, depends on the professor's own background and experience with low income students. Professors are not necessarily aware of the plights of low income students because they may not come from the same financial background or are unfamiliar with student dynamics from lack of immersion within the student body:

"[this professor] doesn't really have like any good answers whenever we brought --
whenever I bring it up it's always like remember [this alum]? She would bring up past
students" (11)

Students may be inspired by alumni and have admiration for these successful figures, but it is

ultimately unhelpful for those who are looking for specific steps to take and find security. For

low income students who report being wary about the financial aspects of medical school, it is

difficult to receive advice on the physical steps a student should take from professors.

If there is not a strong relationship between the professor and the student, a student's

interaction with their professor may be constrained to academic purposes. To network with

professors is to gain security from their advice on the steps they can take to better understand the

practical steps and passion for medicine:

"I don't think everyone doesn't deliberately but I think they're so detached from what is
happening with the student body and so many of them genuinely care but like no one will
take the time to say this is what's happening amongst the students on campus right now"
(15).

By not engaging with the student body at the ground level, it is more likely that professors are

not as cognizant of the interactions among students. Moreover, when offering their most honest

advice, professors may not be able to speak from previous experience. Due to this lack of

personal experience, professors may not be cognizant of how their advice perpetuates a

monolithic image of the successful pre-med student. This can be disheartening for students that

do not fit this image, and can perpetuate the dominant culture of competition among pre-med

students. By emphasizing personal achievement, students may fixate on their own personal

shortcomings. As discussed earlier, those who do not have network of peers that are more

collaborative may not endure the rigors of pre-med because they do not feel they can measure up

to the achievements of their peers. To achieve high status is emphasized as success within the

pre-med department:

"I think part of it's like a Reputation thing or like a legacy thing like. They... not necessarily that they want to be able to claim like oh I taught the student this is why they know this thing but they want to know that their students are going on to be like the top at that field and like they don't want to accept like 'I want to just like teach middle school science.' Like that's not an option" (15)

By bringing up certain students who have consistently achieved a high level of success, -- those who do not match up with those students are reminded that they are behind and cannot meet their professors' expectations. Constant bombardment of the successful pre-med student can be disheartening. There is the expectation among professors that pre-med students are to be the best of their class. When a Black of Latinx student encounters doubt from a professor, it can be pivotal in determining their aspirations in medicine:

"as soon as I left the office of that like chairperson of that major, I immediately was just thinking like there's no way I can continue if this is the way that people are gonna look at me" (13)

The dejection that a Black or Latinx student is not just constrained to this one experience. As emphasized earlier, Black and Latinx students are constantly met with condescending attitudes from their peers and can inform them of the bias they might encounter later in their journey to professional medicine. The pressure felt by students to become the top of their class in addition to the academic stresses that accompany pre-med classes and unexpected hurdles of life can influence the retention of a pre-med student. However, there are strategies that Black and Latinx students devise to persist against the odds. Students who have years of experience working with individuals who expect less from them recognize a shift from worrying about looking dumb to becoming more independent:

"I think every year that I'm here, um, I go to professors more I go to office hours more ask some questions because I'm less afraid of looking dumb. I think it's because I think sometimes people already assume that of me and I don't really care" (6)

The note of class year is important to note here because this respondent identifies as Black and has undergone multiple racialized experiences on campus as a senior -- especially in lab work. She elaborated on her experiences with peers and professors condescending against her and expecting less. This influenced her to grow a callousness in response to marginalizing experiences. Although a student may grow the ability to ask professors for assistance with a subject, by not prioritizing a personal relationship over assistance with academic material, opportunities for lab experiences or concrete professional advice are not open. It is important to understand the strategies and the barriers that come with these strategies that may impede the success of underrepresented pre-med students.

Men pre-med students are more comfortable with forming friendships with professors than women. Sometimes students that overcome the barrier of comfortability to talk to a professor don't have the social stamina to keep fostering the relationship and the connection diminishes and eventually disappears:

> "I remember like when I first started doing research for [this professor], I was really hoping like I could seek her out as a mentor because I like admire her. Um, and I think in the first, semester after my summer internship with her like I would go to her office, um, like a few times and be like, 'oh hi' like, 'how are you doing?' … but I feel like. That relationship hasn't really continued as much after like the next few semesters" (14)

On account of one's own ability to go into the office to check in with her research professor, students may not have the social stamina to keep up a valuable relationship with a professor. Cultivating a relationship requires constant motivation on part of the student. There is not enough guidance that grants students the skills necessary to cultivate a meaningful relationship.

Professors that offer help during office hours open the possibility of forming connections with students. Students who have prior knowledge from high school understand that office hours aren't just a resource for getting school help. It is an opportunity to develop a relationship with

their professor to gauge the potential of a lab position or a letter of recommendation. Students can apply for summer research positions with professors towards the middle of their spring semester, but this process depends on their own level of engagement with the professor and interest in their work. Lab experiences can be utilized by students to understand their own degree of interest in lab work. This hands-on experience enables students to gain the understanding of their own affinities towards the lab and can solidify their career aspirations thereby mitigating insecurity concerning post-baccalaureate plans.

Feelings of competition can stem from how students use their vertical relations. Students who are successful in networking do not just benefit from Colby lab experiences, professional lab experiences, and shadowing. They also benefit from a feeling of certainty in how well they can achieve their career aspirations. Students who may not have the social background in networking, even after attending office hours and meeting with career advisors, may still not know what concrete steps to take to feel like they are on the same level as their peers. Students often explain this feeling as "feeling behind" or as if "they should be doing more." Students who feel this way also express the lack of support they feel from professors and advisors -- reporting that even in the effort of asking for help, they still felt that they weren't given helpful direction. It is important to note that these students distinguished themselves from the typical pre-med student

> "So freshman year, he told me to reach out to all of these professors in the psych department and into biology department who are doing research with things I was interested in… she offered me a position and I've been working for her with her since sophomore fall and she's been one of my greatest mentors." (11)

By receiving advice on the concrete steps one should take, a pre-med student can secure relationships with professors and gain research experience as well as another guide along the pre-med journey. Knowing how to cultivate a relationship is built through the experience of actually

forming a relationship. With that skill, students can better cultivate relationships with advisors and professors.

There is a barrier to developing meaningful relationships with professors and advisors. When I asked participants how they used office hours, there was gender discrepancy. Both women and male respondents saw office hours as a time to get extra help from the professor, but men openly reported that office hours were more of a time to develop a relationship.

Professors are influential in guiding the trajectory of a student. Through encouragement and validation, a professor may be a component of the drive of a particular student to continue with medicine. The ability for students to initiate and cultivate a relationship with their professors is a skill that necessitates prior experience with networking and a level of comfort.

Students that do not have this skill prioritize office hours and seeing professors on a purely academic basis. This shuts them out of developing a more meaningful relationship that may yield research positions and concrete career advice. When a relationship is not strong, professors to offer the experiences of other students -- however, this usually means that only students who have garnered exceptional success are brought up -- thereby constructing a monolithic image of the standard of pre-med students. Students who do not relate to this image and feel insecure about their own futures feel behind their peers. Students who do not have prior knowledge of networking, do not have personal ties with professors, and feel as though they do not meet the standard of the pre-med student bear the greatest pressure and may face the greatest temptation to drop the pre-med title. Black and Latinx individuals are disproportionately likely to feel this way because they feel as though they need to exceed expectations to meet the level of their peers.

CHAPTER 5: SEMI-VERTICAL RELATIONSHIPS

When talking about their mentors, participants usually responded with influential professors or advisors that guided them towards a career path or gave them advice on course selection. In rare instances, students talked about their experiences with student mentors. These student mentors were older students that participants met at extra-help sessions and in the labs that they worked in. Only 3 out of 15 students reported having a student mentor. Even students in the CAPS program said that although there was a support system within their cohort before the academic school year began, when school started, CAPS students didn't feel as connected. They took the opportunity to befriend other students not in their CAPS cohort. A similar dynamic was revealed through interviews with QuestBridge scholars. Due to the low level of student mentorship, this may play a role in the retention of Black and Latinx pre-med students.

It is important to establish mentorship between older and younger students. By facilitating a strong connection, younger pre-med students who don't have experience with networking don't need to go through emotional labor of asking for help they may not know they can receive without proving their own academic ability.

Most of the respondents of this project did not report having an older student or alumni mentor. Of those that did, they expressed having met these individuals in their research lab, extra help sessions, or TA hours. Even if they don't have the same aspirations, older students can be helpful in giving advice on what classes to take, how to study for them, and an overview of the professor's teaching style and personality:

> "[my lab-mate] like she wasn't going to medical school so it was more of I saw her more as a role model like for at Colby like what do I want to be doing at Colby like how like Basically like how what classes to take or like any suggestions for like the professors or how to like study for certain classes" (14)

Even if an older student was not going into the same profession, they can still be a source of advice and inspiration. Sometimes, the advice can be sharing a story with concrete steps on what the younger student can do to secure their aspirations of attending medical school by taking advantage of professional opportunities and the connections to make:

> " [this woman,] who's a pre-med student graduating this year also like had a bunch of research experience even though she's part of a different major and, Like basically they gave me ideas of like where like who to look for when I'm shadowing or like what to do in terms of like pre-med when I was like first starting out because we're so close to age." (14)

Students who are in different majors who maybe haven't graduated yet can tell students what their lab experiences are like and what steps a pre-med student should take if they're truly committed to medicine. Proximity in age can be influential for a younger student. Mentoring students who are close in age can be important for those that are taking concrete steps towards professional opportunities in medicine because students who are just one grade above their mentee can shadow a doctor or research in a professional lab and then tell a younger student about that experience. They can give an inside look into their experience, tips on how to apply, and what to do once in the lab.

CHAPTER 6: CONCLUSION

This project set out to understand how race, socioeconomic status, and gender influence how feelings of competition are socially constructed among pre-med students at a liberal arts college. Although the dominant culture among pre-med students is one that rides on competition and out-performing peers, students who choose not to opt into that strategy can find peers of like-mindedness. The formation of a constructive study group takes time, confidence, and experience. Collaborative group work can balance the highly-competitive nature of intently-graded discussion sections. Respondents acknowledge that competitive discussion sections are helpful because they pressure them to speak out even when they doubt themselves and prepare for what they presume to be the environment of medical school. Discussions also pervade the dominant culture of competition in pre-med studies, where students are encouraged to prioritize their grades over the success of others and their own understanding of the material.

This ability to form a conducive study group is dependent on race. Pre-med students belonging to underrepresented groups have a more difficult time finding group members with the similar experiences. At a predominantly white institution, Black and Latinx students are less likely to form study groups in response to marginalizing experiences. To avoid discouragement, Black and Latinx women become more independent and feel the need to overcompensate to demonstrate their competence with the academic material. These strategies can be isolating, but they enable endurance along the pre-med track. Supporting the assertions of Morales (2018), despite experiences of marginalization and exclusion, Black and Latinx women following the pre-med track persist by developing strategies through overcompensation and becoming more academically independent. Although collaborate Asian pre-med women also feel self-doubt when they encounter more competitive students, they eventually find a group of students who

share the same collaborative studying style. The distinction between Black, Latinx, and Asian pre-med students is important to consider when analyzing the nature of group work.

The ability to form connections with advisors and professors is dependent on how early students engage and begin cultivating a meaningful relationship. How well a student can foster a strong relationship is influenced by how much experience a student has networking and their level of confidence. Women express more tentativeness to go to office hours because they feel as though they need to develop competence with the subject material before making a meaningful connection with a professor. Men are more comfortable with utilizing office hours as an opportunity to befriend a professor. Men in this study also reported the inclination to form ethnic ties with professors that share the same race. The women that did form ethnic connections with their professors showed admiration in a non-familial sense. The ability for men to form meaningful connections sooner and with more ease grants greater access to lab research and personalized advice that can guide them and gain certainty in their aspirations.

Further research should be conducted to uncover the strategies that students of color use in the pre-med department. This can be done through in-depth interviewing with a specific focus on the barriers that pre-med students of color come across and their actions aimed to mitigate feelings of uncertainty of self-doubt. Furthermore, in-depth interviews with professors should be conducted to understand their take on the environment among pre-med students. With this work I want to propose a program to Colby College that focuses on early-engagement and education on steps towards cultivating meaningful relationships with professors and advisors. The lack of mentorship within the pre-med track can be remedied through early engagement with students who aspire to enter medicine.

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