A Qualitative Exploration of Pre-health Students' Perceptions of Academic Success and Persistence

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Motivation and psychological characteristics play important roles in college student success. Upon matriculation, pre-health students must strive for academic success to present competitive profiles for health professions schools. In this qualitative study, 17 high-achieving, upper level pre-health students at a large, mid-Atlantic university participated in focus groups and wrote letters of advice to incoming freshmen, which provided insight into their definitions of academic success and the psychological and contextual factors they perceive as promoters of success. They struggled to reconcile their mastery goals for academic success with perceived expectations to perform and compete for admissions to health professions schools. Students with grit maintained passion for long-term goals and actively sought resources to support individual needs.

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Although access to undergraduate education has expanded, educational outcomes for all students need improvement (Tinto, 2006). College success outcomes, namely retention and graduation rates, have received increasing scrutiny (Barrow, Brock, & Rouse, 2013; Grites, 2016). Research has also indicated that resource availability for students during their transition to college matters little unless students utilize the support when encountering difficulty (Yeager & Dweck, 2012). Advisors face pressures to contribute to better student outcomes through their relationships and could use more tools to help students. Understanding the motivations of high-achieving college students in a challenging curriculum may inform advising practices and guide interactions that promote the academic success of all students.

Investigations of the relationship between psychological variables and college student academic success have proliferated in recent years and evidence is mounting for the powerful influence of motivation and character traits on student success (e.g., Shechtman, DeBarger, Dornsife, Rosier, & Yarnall, 2013; Sparkman, Maulding, & Roberts, 2012). They have shown that grit, perseverance, effort, tenacity, academic mind-sets, and achievement goal orientation all contribute to student success when combined with the talent and traditional cognitive factors also shown as important to academic achievement (Duckworth, Peterson, Matthews, & Kelly, 2007; Dweck, Walton, & Cohen, 2011; Guiffrida, Lynch, Wall, & Abel, 2013). However, student perceptions of motivational and contextual factors identified as promoters of success, specifically those of undergraduate pre-health students, remain understudied. Bringing these perceptions to light may provide valuable insights that advisors can integrate into practice to support pre-health students in successfully reaching their academic goals.

Students pursuing entry to health professions training programs, commonly referred to as *pre-health students*, matriculate with a wide range of backgrounds, skills, and goals. They face particular challenges as they transition to undergraduate study (Arnold & Schneider, 2010), such that many immediately enroll in the challenging math and science courses required to fulfill admissions requirements for postgraduate professional schools. In addition, from the time they set foot on campus, most pre-health students are keenly aware of the competitive nature of admissions to health professions programs. These aspiring doctors, nurses, and dentists know (or quickly learn) that they must maintain high grade-point averages (GPAs) and accumulate hours of experience in the field through volunteering, research, and shadowing. Advisors working with pre-health students play a vital role in helping them navigate challenging course work, extracurricular involvement, and the many facets of rigorous postgraduate admissions procedures (Arnold & Schneider, 2010).

For this study, we explored high-achieving, upper level, pre-health students' perceptions of academic success and the factors they viewed as contributing to their own success. Information learned from students who have successfully navigated a challenging program of academic study adds depth to understanding the ways students define academic success and their underlying motivation.

The following research questions guided the study:

RQ1. How do high-achieving undergraduate pre-health upper level students define academic success in college?

RQ2. What do high-achieving undergraduate pre-health upper level students identify as psychological and contextual factors (e.g., tutoring services, advising) that support and promote academic success?

We intend that this study will inform the development of programs and practices that promote college student retention and success.

Literature Review

This study was grounded in theories of motivation and informed by research highlighting the psychological factors that influence student success. Therefore, we present an overview of grit, academic mind-sets, and achievement goal orientation, along with that of appropriate institutional supports proven useful for pre-health students in particular.

Psychological Factors

Grit. In promoting academic success among college students, grit has been named as a promising personal characteristic (Dweck et al., 2011). Defined as perseverance and passion for the pursuit of long-terms goals even when faced with challenges, high scores on the grit scale predict achievement in academic and vocational, among other, domains (Duckworth et al., 2007). Students who demonstrate grit persist in working toward goals for longer and with more intensity than peers who do not, and level of grit predicts success more than does talent alone (Duckworth, 2016). Choosing a long-term goal to pursue involves commitment and focus, often to the exclusion of other goals or activities (Peterson & Seligman, 2004), which proves challenging in university settings, where students encounter difficulties and distractions that can impede academic progress and success.

Educators have embraced the construct of grit and have rushed to integrate grit assessments and training into an already burdensome curriculum (e.g., Sparks, 2015; Steiner-Adair, 2013). However, research focusing on grit in college students remains limited, and quantitative work has revealed little on the processes underlying grit. Duckworth (2013) expressed concerns that enthusiasm for the construct and preoccupation with measuring grit in students are outpacing an understanding of the way people acquire or develop grit.

Grit entails two components (Duckworth et al., 2007; Duckworth & Quinn, 2009). The self-regulatory aspect is described as the *perseverance of effort*, which consists of behaviors and beliefs that impel action and motivate individuals to choose activities that advance progress toward goals. For example, with self-regulation, students choose to study the night before an exam rather than spending time with friends. The other component, *consistency of interest*, refers to a long-term orientation toward a future goal. Keeping a future goal in mind and maintaining passion prove essential elements that distinguish grit from other self-regulatory constructs.

Academic mind-sets. Academic mind-sets show a strong link to student performance and persistence in times of struggle (Dweck, 1999; Dweck & Master, 2009). Students with growth mind-sets believe that intelligence can grow with effort, while students with fixed mind-sets believe individuals are born with a certain amount of intelligence that additional effort cannot change (Perkins-Gough, 2013). A central component of academic mind-sets revolves around the way individuals with fixed or growth mind-sets respond to challenges; that is, students with growth mind-sets approach challenges as opportunities for growth, persist in time of challenge, and demonstrate resilience when faced with failure (Dweck & Master, 2009).

In addressing the connection between academic mind-sets and grit, Duckworth hypothesized that individuals with an attitude that they can get better with effort are "more tenacious, determined, and hard-working" (as cited in Perkins-Gough, 2013, p. 19). Grit, like growth mind-sets, can be improved with effort and deliberate practice (Duckworth, 2013, 2016).

Achievement goal orientation. Evidence has mounted about the relationship between

achievement goal orientation and academic motivation. Meece, Anderman, and Anderman (2006) explained, "Achievement goal theorists focus on students' intentions or reasons for engaging, choosing, and persisting at different learning activities" (p. 490). Traditionally, achievement goals have been divided into two categories: learning and performance. Learning goals (referred to as *mastery goals*) are focused on task involvement, whereas performance goals are driven by ego (Ames, 1992).

Individuals with mastery goals concentrate on learning tasks, demonstrating effort and persistence, and utilizing adaptive learning strategies (Ames, 1992; Dweck & Leggett, 1988). Those with performance goals focus on outperforming peers or seek to avoid appearing incompetent. Studies on performance goals have offered fewer conclusions than those on mastery goals because performance goals are further divided into performance approach and performance avoidance goals, which are associated with different attitudes and behaviors respectively. For instance, students with a performance approach goal are driven to demonstrate competence and put in extra work to outperform peers. The extra effort leads to outcomes comparable to those with mastery goals. In contrast, students with a performance avoidance orientation do not want to appear incompetent and may develop maladaptive strategies when challenged with difficult material, such as studying less and procrastinating so that they can attribute failure to lack of effort rather than lack of competence (Kaplan & Maehr, 2007). These findings prove particularly relevant to the experience of pre-health students who are required to learn increasingly difficult science content in preparation for professional school.

Pre-health Students: Academics and Institutional Supports

Pre-health students encounter substantial challenges or barriers characteristic of their specific programs of study. Many students starting the journey to a health professions program do not reach their intended destination. Their changing goals likely result from a number of factors, including academic challenges, especially in prerequisite science course work. In a sample of 15,000 students, 20% who took one gateway science course subsequently completed four or more science courses (Alexander, Chen, & Grumbach, 2009). Although this percentage included students other than pre-health majors, other findings have shown that many students do not enroll in additional science classes after encountering one challenging course. Additional research on chemistry courses showed that many students abandon pre-health studies after taking chemistry (Barr, Gonzalez, & Wanat, 2008; Barr, Matsui, Wanat, & Gonzalez, 2010).

Challenging science courses or substandard grades do not account for all students who shift their career aspirations. Nonacademic reasons include losing or changing interests after experiencing various career exploration activities (Thurmond & Cregler, 1999). Maintaining interest toward a long-term goal, a key component of grit, appears important for understanding the way high-achieving students sustain interest in a health profession despite challenging course work.

Colleges and universities provide academic and social supports to students in many different forms. First-year seminars and supplemental instruction have demonstrated notable success in increasing academic performance and retention for students of varying academic abilities and backgrounds (Pascarella & Terenzini, 2005). However, the extent to which services are used depends on several factors, specific to individuals, including students' responses when encountering difficulty and their willingness to seek and utilize resources that meet their needs (Karabenick, 2004). Despite the support from advisors, the review of the literature on pre-health students suggested that little effort has been directed to address the role of advising in promoting the long-term success of these students. Therefore, we sought to advance the understanding of successful pre-health students' perceptions of both psychological and contextual factors deemed important when progressing through their pre-health studies, especially in relation to overcoming academic challenges and failures.

Method

Using a qualitative study, we explored pre-health students' perceptions of success and factors they perceived as influential to their success. We used a constructivist approach and thus sought to understand the subjective meanings students ascribed to their educational experiences (as per Merriam, 2009). Multiple methods of qualitative data collection generated complementary support of students' perceptions of success and motivation (as per Maxwell, 2013). The focus group format allowed participants with common experiences to

articulate their thoughts and build off the contributions of others. Asking participants to write about their perspectives encouraged expression in an alternate modality, thereby adding depth to the evidence collected (as per Polkinghorne, 2005). This process generated evidence for the way grit contributes to student success and advanced knowledge about the specific underlying psychological mechanisms of the construct not previously found through quantitative studies.

Participants

We conducted the study at a large, public institution of higher education in the mid-Atlantic region of the United States. The institution welcomes more than 3,000 first-time students each fall semester including a large pre-health student population. Because of differences in the requirements for entry into different health professions programs, we focused on two similar pre-health student groups: pre-dentistry and pre-medicine. These concentrations require several years of undergraduate course work, similar prerequisite courses (e.g., biology, organic chemistry), excellent academic performance, entrance exams specific to the field (i.e., MCAT and DAT), and substantial volunteer and service experience necessary to present competitive applicant profiles. The Institutional Review Board approved the protocol.

We used purposeful, intensity sampling of information-rich cases, conducted in collaboration with a pre-health program administrator at the university, to identify potential participants (as per Polkinghorne, 2005). Intensity sampling allowed for the identification of students who demonstrated academic success, but not as outliers, and who embodied the psychological characteristics and behaviors of interest (as per Patton, 2002). The director of pre-health advising generated an e-mail list for upper level undergraduates who had earned at least 75 credit hours with a GPA of 3.25 or higher and who self-identified a health professions track of either medicine or dentistry. A qualifying GPA of 3.25 was selected because the mean GPA of the students applying to medical and dental school is reported as 3.55 and 3.38, respectively (American Dental Education Association, 2016; Association of American Medical Colleges, 2016). Students received an e-mail describing the study and an invitation to participate. Students registered for focus groups via an e-mail link. The participant demographics ($N = 17$) are presented in Table 1.

Procedures and Data Collection

To enhance the richness and depth of the students' perceptions of their pre-health academic experiences, qualitative data were collected in both verbal and written forms: focus groups and individual reflection letters. In their letters, students were asked to provide advice, based on their own experiences, to incoming students for success as a pre-health student at the institution. This prompt was derived from the research questions and inspired by research involving written reflections from college seniors to entering students (e.g., Walton & Cohen, 2011) along with our own professional experience in designing comparable exercises for new student programs. See Appendix A for the writing prompt.

Focus group questions were derived from construct-related literature, specifically in the areas of grit and academic mind-sets (e.g., Duckworth et al., 2007; Dweck et al., 2011; Dweck & Master, 2009) and previous professional experience working with pre-health students. We started the focus groups by asking the broad question, "How do you define academic success?" This question, derived from a previous study of college student academic motivation (Van Etten, Pressley, McInerney, & Liem, 2008), was asked first so that students' responses were not primed by other questions about specific instances of successes and challenges. Subsequent questions explored students' definitions of academic success and times that they felt academically successful, seemed highly motivated, and encountered academic difficulty. Grit-related questions focused on persistence and goals, such as, "If you were to receive a failing grade on an assignment, what would you do?" Questions based on academic mind-set theory were designed to obtain information about students' beliefs on the capacity to improve academically, such as "What characteristics do you think make some students successful while others give up?" Finally, students identified people and resources that they found useful during their transition to the university in response to "What academic support services did you personally use as you started the pre-health program?" See Appendix B for a complete list of focus group questions.

We conducted a small pilot study to test the focus group questions with students enrolled in

Table 1. Participant demographic profile ($N = 17$)

Characteristic	*N*	%
Gender		
Female	12	70.6
Male	5	29.4
Ethnicity		
Hispanic or Latino	1	5.9
Not Hispanic or Latino	16	94.1
Race		
African American	5	29.4
Asian	5	29.4
White	4	23.5
More than 1 race	1	5.9
Other	2	11.8
GPA		
Mean	3.733	—
Range	3.29–4.00	—
Academic status		
Junior	6	35.3
Senior	11	64.7
Major		
Anthropology	1	5.9
Biology	8	47.0
Biomedical engineering	1	5.9
Biomedical engineering/biology	1	5.9
Chemistry	3	17.6
Health and exercise science	2	11.8
Science	1	5.9
Science: pre-health concentration		
Pre-dental	4	23.5
Pre-med	12	70.6
Pre-nursing	1	5.9

an undergraduate-level educational psychology course. The initial interview protocol was divided into five parts with three or four questions per section. Students were placed in small groups in which every individual was asked to provide written responses to one section of questions. Then, the volunteers participated in cognitive interviews to explain the way they developed their responses to individual questions (as per Groves, Flower, Couper, Lepkowski, Singer, & Tourangeau, 2009).

This preliminary process helped us refine or delete questions. For instance, student responses to the pilot study question "what would you change to make the college experience more positive for students?" were vast and unfocused because many referred to issues such as parking or other nonacademic concerns; therefore, this question was not asked of the pre-health students in the primary study. Additional questions were refined according to the information gleaned. The final interview protocol consisted of 11 items (Appendix B).

In the data collection phase, two team members facilitated five focus groups; each lasted approximately 1.5 hours. An appropriate number of focus group participants ranges between six and eight, so that each can comfortably interact with others and express their views (Merriam, 2009). We expected at least five students per group; however, participant nonattendance proved a challenge and between two and five participants attended each group. Although four students were scheduled to attend, one group consisted of a single participant. Because she expressed an eagerness to stay and share her thoughts, we considered her question-and-answer period as an individual interview. Confidentiality was important because students described instances of personal success and failure. Therefore, participants did not share their names on their demographic sheets or written reflections, and we instructed them to refer to each other by an initial (e.g., *M*) rather than full names during the focus groups. Demographic information was collected for the purposes of describing the participants (Table 1).

Reflection letters and focus groups were completed in one session. The individual letters were written first so that the information offered was not influenced by the focus group discussions. For the focus groups, we utilized a semi-structured interview protocol to allow for follow-up and probing questions to clarify participants' responses and gather additional detail. Toward the end of the focus groups, we asked participants to elaborate on any advice to new students they provided in their individual letters or address aids for success that had not been specifically addressed in the focus group. We audio recorded and transcribed each session so that the qualitative data could be entered into Atlas.ti 7 (Scientific Software Development GmbH, 2015), a qualitative data analysis software, for coding.

Data Analysis

We developed a code list using both in vivo coding, to include the participants' own words, and structured motivational constructs derived from psychological motivation literature (Corbin

& Strauss, 2015; Saldaña, 2013). This multidimensional approach allowed us to investigate concepts evident in the literature (i.e., components of grit, academic mind-sets, goal orientation) and utilize ideas introduced by participants (i.e., achievement goal orientation) (as per Hseih & Shannon, 2005).

A sample of approximately 10% of the data was used for the initial deductive code development. Because of the difficulties in achieving intercoder agreement among multiple researchers, we used the first cycle coding to apply a priori codes and develop descriptive and in vivo coding (as per Miles, Huberman, and Saldaña, 2014). Each of us on the five-member research team developed a code list based on the sample of data, and then, we came together to consolidate lists, agree on terms, and create operational definitions. Once we compiled the code list, each of us recoded the letters used in the first cycle of code development and also coded the remainder of the data with the compiled codes. Reflection letters and focus group transcripts were grouped together for coding because each intentionally addressed one of the research questions; the letters focused on academic support structures and the focus groups prompted discussions on academic success, failure, and motivation. Codes were adjusted or added throughout the processes to account for new topics or themes that emerged throughout the data-analysis process (as per Miles et al., 2014).

After independent coding, we met weekly to conduct a line-by-line analysis of the codes. We each maintained notes throughout the individual coding process to facilitate further discussion regarding code assignment (as per Saldaña, 2013). Discrepancies in code assignments were discussed until we all agreed on each code. We used Atlas.ti 7 (Scientific Software Development GmbH, 2015) to facilitate data organization and calculate code frequencies. Through a summative data analysis process, the codes with the highest frequencies were further analyzed using latent content analysis to explore and interpret participants' meaning behind their words and identify emerging themes (as per Hsieh & Shannon, 2005).

Trustworthiness

We followed several procedures during study development, data collection, and analysis to support the trustworthiness of the findings to enhance transferability, dependability, credibility, triangulation, and confirmability (as per Guba, 1981; Lincoln, 1995). The in-depth descriptions of the student population invited to participate in the study, the context of the study, methods, and limitations are presented to promote the transferability of the findings (as per Guba, 1981; Shenton, 2004). To support the dependability of the findings, our five-person team independently coded the data and discussed differences in applying codes. As educational psychology doctoral student researchers, we represented a range of perspectives and expertise including student success, motivation, and extensive pre-health student programming experience. We were advised by an associate professor with expertise in academic motivation.

Furthermore, the credibility of the findings is supported by processes employed throughout the data collection and analysis. We debriefed after each session to discuss any issues that emerged, and we verified our codes by listening to the recordings made of the focus groups. During the analysis, especially when disparities arose on the code assignments, we documented our own thought processes. Finally, we met weekly throughout the analysis process to reaffirm our common understanding of codes.

Findings

The findings of the study are presented in the form of seven themes categorized into two overarching categories: definitions of academic success and student-perceived factors that contribute to and promote academic success. A summary of categories and related themes follows:

Category 1: Definitions of academic success
- Importance of grades
- Value of learning and hard work
- Altered definitions of academic success because of future orientation and goals

Category 2: Factors that contribute to and promote academic success
- Grit—passion and commitment toward long-term goals
- Grit—effort, challenge, and persistence
- Individual strategies for success
- Students with grit became resourceful when facing challenges.

Quotes from participants were identified by focus group session or reflection letter. For example, FG1 indicates a participant from focus group number one, and RL1.3 indicates reflection letter from Participant 3 in Focus Group 1.

Table 2. Participants by focus group and letter of reflection

Focus Group	*n*	Letters of Reflection
1	5	1.1, 1.2, 1.3, 1.4, 1.5
2	2	2.1, 2.2
3	5	3.1, 3.2, 3.3, 3.4, 3.5
4	1[a]	4.1
5	2	5.1, 5.2
6	2	6.1, 6.2
Total	17	—

Note. [a]Individual participant because of nonattendance of other group members.

To avoid misattribution, focus group quotes were not attributed to specific participants because the identities of individual speakers could not be discerned from the audio recordings. A breakdown of the characteristics of focus group participants is presented in Table 2.

Category 1: Definitions of Academic Success

Students gave multifaceted definitions of academic success. Evidence emerged of their internal struggles to maintain a commitment to learning in the context of a highly competitive academic program that relies heavily on grades to measure success. Their responses were broken down into the three themes described.

Importance of grades. Most pre-health students in this study referred to the importance of grades, either in specific courses or overall GPA. A student in FG5 explained, "Academic success for me is really getting the points, getting that high GPA, getting those scores you need on those tests because those are really big for any pre-health future. So that's how I would solely define it." Some students, such as one in FG3, focused primarily on GPA as a personal reference for success: "I'm an overachiever. So, I think a 4.0 is academic success." They also indicated that they held grades as a high priority because of external expectations. Specifically, students referred to the value of grades on successful admission to health professions program applications: "Your grades are the foundation of any application" [RL1.3].

Value of learning and hard work. Students clearly explained that they valued high grades so that they could present a competitive profile to health professions schools, but they also acknowledged the importance of working hard to learn and retain information. Defining academic success, a FG3 participant stated, "I . . . think a good portion of it is learning the material so that you can use it readily because if you're always focused on the GPA, it doesn't necessarily mean that you're getting the information." Many students acknowledged the importance of the hard work required because of the rigor of the required pre-health courses and pointed to the importance of taking time to personally acknowledge the effort they put into their studies. A participant in FG1 shared some perspective on work and grades:

> I'm just going to do the best I can; I'm going to give it all I've got. But I think it's just doing your best and knowing that you've done your best because in the end, not everyone can get an A in the class.

The importance of effort for these students was evident when discussing the need to recognize that grades do not always represent the amount of work put into a class. A FG1 participant explained:

> If you do not succeed in the class because of a lack of effort, then you know why you failed. So, I guess sometimes you get unlucky and you put a lot of effort into a class and you don't achieve or perform as you hoped, but I'd still say you're successful because you took advantage of all the resources you had, you put the maximum amount of time that you could towards it, so if that was the maximum grade you're going to get, I would say you'd been successful.

Altered definition of academic success. Future goal orientation informed students' definitions of academic success. Many altered their definitions of success based on other perspectives, specifically those associated with health professions admissions used to define competitive applicants. A student in FG6 crystallized this dichotomous view: "I had an understanding that I needed a certain GPA because let's just be honest, for me, I'm pre-med so applying to medical school, you have to have certain quota in terms of your GPA." This theme bridges the gap between the other two themes, importance of high grades and value of hard work, in that students stressed the importance of effort, but ultimately recognized that grades make the competitive profile. Another student in

FG6 expressed seeking a sense of balance as follows:

> I knew coming in I had to maintain a certain GPA, but at the same time, I also agree I didn't want to just come in and worry about my grades. I also wanted to try to learn something. I made sure that I chose a major where I knew I was going to be able to choose the classes I wanted to take and in the fields that I was interested in. So, it was kind of half-and-half. I kind of had a balance between both [performance and effort].

The need for high grades showed the competition that exists among students, who described wanting to perform at higher levels than their peers, and this competition affected their views of academic success:

> It's not only getting the high grade, but seeing yourself in comparison to other students, which is, I know, a really bad way to look at it and not what people want to hear. But, when you see that you can push past and have like that better grade and that you're on the top of that class, that's what for me is academically successful. [FG5]

Category 2: Factors That Contribute to and Promote Academic Success

Students consistently referred to the need to maintain passion and commitment in moving toward their goals, especially during times of struggle, and we present their comments within the framework of grit. In addition, students also discussed the need for individual strategies and sources of motivation to promote academic success. These findings are presented by four themes.

Grit: passion and commitment toward long-term goals. Future goal orientation was a driving force for students who showed grit. A student in FG1 described this focus simply: "I guess keeping the final goal in mind, what you're trying to achieve." Many students recognized the importance of understanding their end goal as a health professional to push past academic struggles. A FG1 participant explained:

> If you're passionate about something, even if you fail, you're . . . going to keep being persistent. But, if you don't really care about something, you might go, "I failed, [I'll] just change my major," or whatever it is. You really have to care about what you're studying and how much you want it.

Although many participants spoke about using their intrinsic career goals to promote persistence, a few students went a step further to provide detail in how those career goals may influence persistence. For example, a FG3 participant referred to the way passion for future goals may cause students to reflect and change their behavior:

> I think . . . what makes the difference between the people [who] tend to succeed after they fail and exceed those expectations are the ones that are really passionate about what they're going to do. So, they're going to self-reflect and try to push past whatever it was that was holding them back before.

Grit: effort, challenge, and persistence. Almost all participants acknowledged encountering some level of challenge during their academic journeys. These obstacles ranged from difficulty adjusting to professors, performing poorly on a single quiz or test, to repeating entire courses because of a failing grade. Most students suggested that appropriate responses to challenges are more important than receiving the desired grade. For instance, a student in FG6 reflected:

> I mean, you're not always going to succeed. You get a bad exam, it's going to test your strength in terms of how you're going to turn it around. So, for me, I always wanted all As in my classes. So, if I got a really bad grade, you've got to sit there and [think], "you have this bad grade, what do you need to do on the exam to get to where you need to go?" And, "do you have the momentum and the strength to actually get to that point?"

While some students speculated that encounters with continuous failures may have inspired self-directed questions about continuing on a pre-health track, almost all agreed that incoming students should not allow a single challenge or failure to deter them from pursuing their goals. A FG6 participant stated, "I'd say, just continue trying even if that means taking the class a second

time around. Just because you don't do well the first time doesn't necessarily mean you're not cut out for this."

Individual strategies for success. Study participants identified several strategies important for pre-health students, such as time management and study strategies, but also noted the importance of understanding that effective learning strategies differ by individual. As a student in FG1 explained, "[the important factor is] learning your own study style and really maximizing how effectively [you learn] and how you focus your time. Not really just grinding, [or finding out] what works for other people, but figuring out what really works best for you." Another student elaborated on the importance of finding individual strategies as a way to stay motivated:

> I'm just really motivated right now because I think this is the first semester I actually know how to study. This is the first semester I've learned what works for me and what doesn't work for me. Because last semester was kind of like a learning curve. And so, I feel really motivated because I feel like I'm better prepared to just take on this semester in general. [FG3]

Grit and resourcefulness. Students who expressed characteristics of having grit were also proponents of finding and using the necessary resources for success. A FG6 participant suggested "You can't always do it on your own, especially with the upper level classes. Sometimes it's not enough to just read a textbook and try and comprehend the information on your own; you need an entirely different perspective." Participants urged incoming students to explore resources available to them: "Take advantage of the opportunities you have like office hours, SI [supplemental instruction] sessions, writing center and everything else [the institution] offers" [RL2.2].

Students identified several helpful resources, with professors and supplemental instruction mentioned most frequently. According to these descriptions, professors filled several needs, such as assisting with learning course material, writing letters of recommendation, and providing research experience opportunities. While opinions diverged on specific resources perceived as helpful, the need to find resources or other strategies to assist students in their academic paths was commonly mentioned.

Discussion

Psychological factors and motivation have been shown to positively affect student academic performance (e.g., Duckworth et al., 2007; Dweck & Master, 2009). Exploring perceptions of academic success and the factors that contribute to success among high-achieving students in the context of their pre-health studies revealed information helpful in informing practices for advisors and student service professionals. In addition, although the conceptual frameworks of grit and academic mind-sets guided the study, the use of a qualitative methodology, including in vivo coding, led to the emergence of another key framework based on participants' responses: achievement goal theory. For this discussion, we included a brief overview of achievement goal theory and the way it may help in understanding how pre-health students define and internalize the concept of academic success.

Factors That Contribute to and Promote Academic Success

Students' reflections revealed a strong connection between the two components of grit: long-term goal orientation and self-regulation. Students repeatedly referred to their passion toward their long-term goal of going to medical or dental school as the driving force propelling them through times of challenge. One student summarized the importance of passion and sense of purpose by urging future students to "know your why" when considering their own pre-health path. This orientation, along with commitment to long-term goals also helped students complete difficult, uninteresting, or seemingly unimportant courses.

To explain the role of self-regulation associated with long-term goals, Yeager et al. (2014) posited, "It seems when adolescents had a personally important and self-transcendent 'why' for learning they were able to bear even a tedious and unpleasant 'how'" (p. 574). Several pre-health students in our study described increased motivation and success in classes that they did not find appealing when they could relate the importance of the material to the care of future patients.

Duckworth and Gross (2014) advocated for learning more about the underlying psychological mechanisms that help individuals with grit become successful. In addition, sense of academic hope, agency, and the generation of alternative

pathways were identified as important characteristics of students who successfully transitioned to college and persisted into their second year (Hansen, Trujillo, Boland, & MacKinnon, 2014). In our study, successful students not only demonstrated perseverance in times of challenge but also showed resourcefulness by finding personally useful support and developing creative learning strategies for tackling difficult classes. This finding suggests that individuals who show grit also possess a sense of agency and willingness to take actions that move them toward their goals.

Pre-health Students' Definitions of Academic Success

Students in our study struggled to reconcile their personal definitions of success with academic expectations of them as pre-health students. Although they expressed the desire to master course material for the sake of learning, they emphasized the need to make high grades to build a competitive profile for applying to professional schools. We explored these two separate, and often competing, viewpoints of academic success through the lens of achievement goal theory, which focuses on student reasoning for engaging in learning activities (Meece et al., 2006). Achievement goal theory emerged as an influential framework that helped us understand the way pre-health students shaped their definitions of academic success and motivation. Many students in our study placed value on the overall learning process and the effort into their course work, showing characteristics of mastery goals. However, when discussing the topic of academic success, the students quickly put aside mastery goals to focus on performance, and perhaps most notably, their performance in comparison to their peers, indicating a shift toward a performance goal orientation.

Students in our study demonstrated characteristics of performance approach goals, such as adjusting their study habits and strategies, asking for help, and managing their time (Meece et al., 2006) and were invested in getting As. This finding aligns with those of previous studies regarding motivational orientation of medical students. For example, DeVoe (2011) showed that students enrolled in medical school and who were motivated by performance approach goals also monitored their learning, developed necessary learning strategies, and showed organizational skills. We did not hear statements consistent with performance avoidance goals in this study, likely because our sample consisted entirely of high-achieving students who had developed strategies that helped them to succeed in their course work.

Although mastery goals have traditionally been promoted as helping students adapt in educational settings, recent research has suggested potential benefits from a dual goal orientation comprising both mastery and performance goals. For example, Senko, Hulleman, and Harackiewicz (2011) suggested, "Students can adopt both mastery and performance goals simultaneously, and students can reap the benefits of each goal by pursuing both" (p. 30). As evidenced by the participants in our study, multiple goals can motivate students to develop adaptive strategies for success. However, an overemphasis on performance goals may handicap students who encounter difficulty.

Research suggested that students with high confidence in themselves may switch from performance approach to performance avoidance goals when presented with negative feedback. In other words, students who approach an academic activity with a sound sense of self-efficacy, based on previous successes and high standards for personal performance, may adopt performance-avoidance behaviors, such as procrastination or decreased effort, after receiving low grades (Middleton, Kaplan, & Midgley, 2004; Senko et al., 2011). In application to the context of our study, many pre-health students enter college with a record of academic success. When encountering academic difficulty or negative feedback, some for the first time, they may react negatively to perceived failure and feel intense anxiety. Academic advisors can help these students normalize the experience and find strategies to respond to academic challenges.

Implications for Academic Advising

Despite acknowledged difficulty in at least one math or science prerequisite course, many students in our study described the ability to maintain consistency of effort in times of struggle and through tedious course work, and many cited their future goals as both influencing their definition of academic success and a key source of motivation. This orientation to long-term goals also characterizes a key component of grit (Duckworth et al., 2007) and should be discussed with students. Yeager et al. (2014) reported a link between persistence and purpose with a series of studies

and showed that college students with a sense of purpose for learning stayed focused and employed the self-regulatory strategies necessary to persist and succeed. With results from our study supporting these findings, we argue for stressing the importance of long-term goals in the educational process for students. For advisors working with students through a difficult semester, focusing on campus resources or other contextual factors may not push students through academic challenges. Advisors can help students develop a self-transcendent view of the purpose of the course work in their overall future plan to increase motivation and help them persevere through difficulties.

Multiple participants suggested that advisors openly discuss challenges that students might encounter and not sugar coat the difficulty of their chosen academic paths. Although not mentioned enough to warrant adding it as an independent theme, some students adamantly encouraged frank conversations. This finding matters to advising, so we informally discussed these findings with advisors, most of whom expressed surprise, noting their concerns with overwhelming new students by emphasizing the multiple requirements necessary to become competitive applicants to health professions programs. Because the view of successful pre-health students seemed to diverge from the beliefs of some advisors, we reflected on the information provided to entering university students.

In many cases, students receive a checklist of requirements they must meet for admission to a health professions program. However, this to-do list may not encourage the student to act. Because students come with different levels of preparedness and motivations for future careers, their various reactions to lists of requirements make sense. Instead, we suggest moving the conversation past listed items and address reasons that pre-health students are expected to participate in volunteer and shadowing activities.

Our study also highlighted the importance of asking students questions that uncover their motivational beliefs. Many faculty members, advisors, and administrators have heard the phrase, "Why didn't I get an 'A?'" Instead of responding on the basis of students' obvious interest in academic performance, they might pursue other information about the students asking these questions: Why do they want that high grade? Did they feel they had learned the content of the exam? Answers to these question may help understand a student's achievement goal orientation and to promote persistence in students facing difficulty. By asking students the reasons the grade is important to them, instructors can discern whether they are focused on learning the material correctly or strictly focused on performance.

In the context of conversations about grades, advisors can share with students the information about motivation and the psychological factors known to influence academic performances. This information may help students understand their choices, thereby empowering them to develop adaptive motivational beliefs that promote academic success.

Limitations and Recommendations for Future Research

Several limitations must be considered when interpreting the findings. For example, the intent of this qualitative project, to explore the perceptions of student success in a specified group of students, meant the research was conducted with small groups that included only students deemed successful by metrics used for admission to professional schools. Also, the large percentage of pre-health students at the university was supported by many resources, including tutoring, supplemental instruction, advising, and academic coaching, not necessarily available everywhere, that had been widely publicized to the pre-health community. Furthermore, the size and scope of the institution also limit the generalizability of the findings to this specific population.

Despite the limitations, typical of this type of study, our findings may inform future research designed to explore differences in the perceptions of psychological factors and motivational beliefs held by students representing the spectrum of academic performances. Specifically, research on the perceptions of struggling students toward academic success and the factors that influence these perceptions is needed. Also, future investigation into the interactions between mastery and performance goal orientations and those who switch from performance approach to performance avoidance goals may provide interesting and useful information to the context.

Although research has consistently indicated that students with grit tend to persevere through challenges, additional research is needed. Qualitative work on grit and underlying psychological mechanisms of the construct are needed to understand the role of grit in success. Also, little is known about the way grit is developed within

students. One way to increase grit is to promote a growth mind-set, which encourages students to reframe challenges as opportunities for improvement (Duckworth, 2013). Therefore, we recommend that studies be directed to identifying the specific thought processes of students who show grit and their perceptions of their own abilities.

Because our study focused on successful students, we could not address the experiences of those who gave up or failed, which would contribute to the understanding of the role of grit during perceived or real failure. Furthermore, the relationship between visions of future selves and grit remains unexplored territory. Research into the role of concrete future goals as an ingredient required to demonstrate grit and investigation into the multiple factors that influence grit, including context, would contribute to the literature. For example, a student may display grit in one academic area but not in another. In light of the range of courses and experiential program components they must complete, pre-health students fit the context for this study, but studies on the transferability of grit across contexts seems a natural extension of this research.

Conclusion

Our study adds empirical support to the importance of motivational factors in college student success. Duckworth and Yeager (2015) advocated for the measurement of attributes other than traditional cognitive abilities and found that "many positive personal qualities other than cognitive ability. . . . contribute to student well-being and achievement" (p. 246). In our study, students did not emphasize natural gifts, talents, or intelligence as the keys to academic success. Instead, grit, mind-sets, and mastery goals were evident. Furthermore, passion for long-term goals proved of particular utility for helping students persevere in the challenging experiences of pre-health studies and prepared them for the competitive world of medical and dental school admissions when combined with resourcefulness and resiliency.

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Appendix A. Writing prompt

Use the space below to write a letter to new, incoming, pre-health freshmen at [insert institution name]. Based on your experiences during the last several years as a pre-health student, use the letter as an opportunity to share advice you would give to new pre-health students to help them be academically successful during their transition to [institution name].

Appendix B. Focus group items

1. How do you define academic success?
2. Describe a time in which you felt academically successful.
3. What does failing a course indicate about a pre-health student's ability to be academically successful?
4. What characteristics do you think make some students successful while others give up?
5. What academic support services did you personally use as you started the pre-health advising track? What other services would be helpful to you?
6. What people (classmates, instructors, etc.) have had the biggest impact on your undergraduate experience? Why or how?
7. Talk about a time in which you encountered academic difficulty. What did you think, feel, do?
8. Can you identify instances when you felt highly motivated? What about those instances made you motivated?
9. Talk about a time in which you felt a lack of motivation. How did you recover/respond in those situations?
10. Remember back to the letter you wrote at the beginning of the session. Is there anything you would like to emphasize based on what you know now about persevering through academic challenges? Why?
11. Based on what we have talked about today, what else that you would like to say?