A Qualitative Analysis of Goal Orientation Theory in Pre-clinical Medical Students

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Abstract

Background: Goal orientation (GO) is a construct which describes domains of motivation in learning. While the end goal of proficiency is the same, the means to attain this differ. Some learners achieve proficiency through a desire for mastery (MG), while others focus on outperforming others (performance approach, PAP) or on avoiding failure (performance avoid, PAV). The aim of this study was to understand how GO theory manifested in pre-clinical medical students.

Methods: A thematic analysis was performed by conducting interviews virtually with pre-clinical students (first- and second-year students, n=10) from an Association of American Medical Colleges (AAMC)-accredited allopathic U.S. medical school. Questions were asked to assess student responses to feelings of achievement and failure in their medical school experiences. Fully anonymized transcripts underwent a hybrid a priori and emergent coding procedure.

Results: Analysis revealed 12 subthemes under three main domains pertaining to the preclinical medical student experience. Students showed highest expressions in Mastery, Performance Approach, then Performance Avoid. Feelings of MG and PAV manifested in a more traditional sense and involved conscientious switching, whereas PAP presented in more diverse subdomains such as reliance on peer support through accountability, a "One Team" approach (the belief that peers are working as a team and led by the desire for everyone to succeed), or a "One Person" approach (the belief that peers are competitors and led by the desire to achieve the best future residency/faculty position).

Conclusion: These findings provide evidence that manifestations of GO constructs are dynamic in individuals and largely context dependent. Within each domain, self-efficacy was shown to be the most common determinant on the dominant motivation profiles expressed by individuals. GO should be further analyzed in clinical students to understand the effect of the clinical learning environment on educational motivation in medical students.

Introduction

In the 1980s, goal orientation (GO) was developed to describe the social-cognitive processes that fuel motivation in adolescent learners, namely, the adaptive (mastery) and maladaptive (performance) patterns of achievement (1). Mastery goals (MG) are focused on achieving individual competency, whereas performance goals are led by the desire to demonstrate competency among or for others. While students that set mastery goals demonstrate higher preferences for challenge and academic risk-taking, those who set performance goals experience negative influences on learning and achievement (2–3).

There are two separate patterns within the performance domain: performance approach (PAP) and performance avoid (PAV). In PAP, individuals strive toward competency by their desire to display ability among their peers. In PAV, individuals strive towards competency through their desire to avoid looking incompetent (4).

To understand which GOs are associated with positive and negative outcomes in advanced learners, studies have utilized variable-oriented, mixed-methods approaches with Likert scales to compare self-reported motivation goals with learning outcomes (3, 5). In 2004, an Academic Motivation Scale survey administered to undergraduate medical students in Brazil found that students that scored higher in autonomous motivation and practiced mastery orientation tended to utilize metacognitive studying strategies involving meaning orientation and reflection in learning (6–7).

Though the relationship between GO and learning outcomes is well described in lower-level learners, there is little known about how GO can develop with student ability to overcome unforeseen academic challenges (8–10). Motivation influences the study habits and learning strategy efficacy of future physicians. This study takes a first-person oriented approach to better understand and predict how GO manifests in preclinical medical students. Through individual interviews of first- and second-year medical students attending a hybrid virtual/in-person curriculum due to the COVID-19 pandemic, we sought to characterize the factors influencing motivation profile switching and dominance.

Methods

Two hundred and twenty-nine students that had just completed their first and second pre-clinical medical school years from Geisinger Commonwealth School of Medicine were invited to complete an interview about "Goal Orientation in Medical Students" in June 2021. Recruitment began through a mass email sent out to the first- and second-year classes. To reduce bias in the interview answers, except for the recruitment stage, the co-investigators had no direct contact with potential or confirmed participants and were blinded to identifying data. All interviews were conducted via the Zoom video conferencing application by a project manager (KY). No authors had conflicts of interest with Geisinger Commonwealth School of Medicine. Interviews were conducted on a rolling basis over a two-month period between June and August 2021. Approval

was granted to Geisinger Medical Center by the Institutional Review Board prior to recruitment of participants. Participants were compensated with a $10 gift card. Informed consent was obtained.

There were two main topics covered by the interview questions. One set of questions assessed general motivation, with a specific slant on GO subtype, such as: *What motivates you to achieve in your current role as a medical student? What (GOs) do you see yourself practicing more and is it different from what is a stronger motivator for you?* Another set of questions assessed the educational environment of the most recent academic year on student learning habits, such as: *How has the COVID virtual learning environment influenced your motivation? How does flipped classroom model and responsibility to come to class prepared affect your motivation to study?* These questions were adapted from previous studies and are the first set of open-ended questions administered from GO theory (11). A total of 14 questions were asked with opportunity for elaboration via follow-up questions as needed.

The interviews each took an average of 40 minutes. They were transcribed, deidentified, and entered into the qualitative data analysis application Dedoose for coding (12). Demographic information collected included student's ethnicity, gender, age, specialty interests, and Myers-Briggs profile (13). These data allowed the authors to ensure a diverse demographic was interviewed (Table 1).

Data collection and analysis

Anonymous interview transcriptions were analyzed utilizing a hybrid a priori method of coding, where root codes were established from GO Theory main subtypes (MG, PAV, PAP) and novel root and subordinate codes were gradually added to capture emergent themes in new transcriptions. To achieve intercoder reliability, following rounds of independent interview transcript coding, the principal investigator (RH) and co-investigator (IC) met weekly to review excerpts and discuss their corresponding codes. New and old codes were added, redefined, or merged with preexisting codes to match evolving data patterns. Using grounded theory guided by GO, and after all the transcriptions were coded, data were re-modeled using memoing to regroup and draw subtheme connections corresponding to each GO domain.

Results

Overall, thematic saturation was achieved after 10 interviews from 7 first-year students and 3 second-year students. There were 7 women and 3 men ranging in age from 23 to 27 years old (Table 1). Out of 244 excerpts, >117 excerpts were coded under MG, >46 under PAP, and >34 under PAV. Some excerpts were coded to more than one orientation or subtheme, and each interviewee was seen to exhibit several orientations even with their response to a single situation (Table 2). The interviews produced a thematic hierarchy of 12 subthemes (Figures 1-3): five subthemes (grouped subordinate codes) emerged under the MG, four subthemes emerged under PAV, and three subthemes emerged under PAV.

Mastery goal orientation themes

Relatability to oneself (MG)

This was the most dominant motivational subtheme seen in preclinical medical students. It stems from a desire to reciprocate the connection felt to another person or topic. This relatability was primarily led by personal interests, but heavily inspired by a human connection or novel academic discovery.

> *The desire to go beyond and to master that material, because you see that the professors care not only about their subject, but about you as well. (Interview 1)*

This comment referred to the student's Gross Anatomy Lab experience, one of the few in-person courses offered. COVID-19 restrictions increased communication barriers as students learned in a predominantly virtual environment. They expressed decreased relatability while viewing prerecorded lectures. When this shortage of human interaction was compounded by depressed academic interest, students showed polarized conscientious switching to a PAV subtheme (Context Dependent).

Future patients/applicability for others (MG)

This subtheme was seen as the desire to help patients and minimize knowledge gaps in future career goal achievement. Students with medical experiences outside of school referred to them as motivators and reminders of future responsibility. These included a relative with illness, memorable patient cases, and physician mentor commitment to service. For students with specialties in mind, several medical curriculum milestones were discussed as building blocks to achieving their future career goals: Step 1 examination, extracurricular roles, and Block examinations. Succeeding in these landmarks were seen as crucial to maintaining a specified career trajectory. This presents as a mastery subtype because students challenge themselves to go beyond what is required when the focus of their attention exceeds their present obligations.

> *I try to remind myself that there are future patients waiting for me to finish my training and…do good for them. (Interview 3)*

Self-competition (MG)

This subtheme describes when learners aim to outdo their previous achievements with each new challenge. In response to the question: What happens to your motivation when you get a bad grade/review? These students described feeling more motivated knowing that they could improve by reflecting on their mistakes. Participants saw self-assessment as a tool for improvement and recovered from failures through augmented self-expectations. This trait was observed to be innate or acquired by educational experiences prior to medical school.

> *You can get by with putting in minimal effort just to pass, but are you really going to be happy with what you've done at the end of the day? (Interview 2)*

"Intercession": Timing and adaptability in students (MG)

This subtheme emerged under coding excerpts on student reactions to prerecorded vs live lectures. The students that preferred prerecorded lectures expressed that the ability to

control lecture speed and take extended study breaks helped to rejuvenate their level of energy and passion. This was comparable to students that experienced renewed motivation after an extended break between blocks. A "block" is an academic layout where exams are given and review is conducted by system (i.e., renal block, heme block). In extensive blocks without breaks, students reported feeling burnt out and were more likely to resort to PAV (Context Dependent) orientation.

> *I've given myself the time and space to process what I'm feeling…and I'm motivated to never feel that way again. (Interview 1)*

Love of learning (MG)

This subtheme describes motivation fueled by the enjoyment felt from the process of learning and understanding a topic. Some learners expressed this with a broad range of subjects, while other learners expressed this only with topics of interest. Learners in this category are guided by genuine interest and reviewed details extending outside class material.

> *If it seems relevant or interesting to my field, I'll be excited for it. (Interview 2)*

Performance approach orientation themes

Self-consciousness (PAP)

This subtheme is defined as self-awareness that occurs with self-comparison to peers. Although most allopathic medical schools are adopting pass/fail curriculums, self-consciousness persists in students comparing their grades to the class average and in discussing learning styles and study resources with peers. The insecurity that developed from these interactions motivated students to modify their performance.

Gender	
Female	7
Male	3
Age (y)	
Range	23-27
Mean	24.6
Completed years of medical school	
One	7
Two	3
Ethnicity	
European-American	6
Asian	3
Hispanic	1
Specialty(ies) of interest	
Emergency Medicine	4
Combined Internal Medicine and Pediatrics	3
Oncology	2
Internal Medicine	1
Family Medicine	1
Cardiology	1
Pathology	1
Dermatology	1
Myers Briggs*	
Extroversion vs. introversion	4:5
Intuition vs. sensing	2:7
Feeling vs. thinking	2:7
Judging vs. perceiving	8:1
*n=1 missing	

Table 1: Summary of participant demographics (n=10)

Excerpt	Goal orientation	Description
My friends make fun of me... they're like, 'You still haven't reviewed it, are you sure?' They're lighthearted jokes but more worried for me. And then I'm like, 'Oh man, should I have actually done this earlier?' (16)	PAP: Self-consciousness PAV: Fear of disappointing self/others or the "Imposter Syndrome Effect"	The awareness of self that is elevated when around others and compared against others Imposter Syndrome Effect: Difficulty with accepting achievements makes it easier for students to accept that they have avoided failure

Abbreviations: 16, Interview 6; PAP, Performace Approach; PAV, Performace Avoid

Table 2: Example of subtheme expression demonstrating several orientations to a single situation

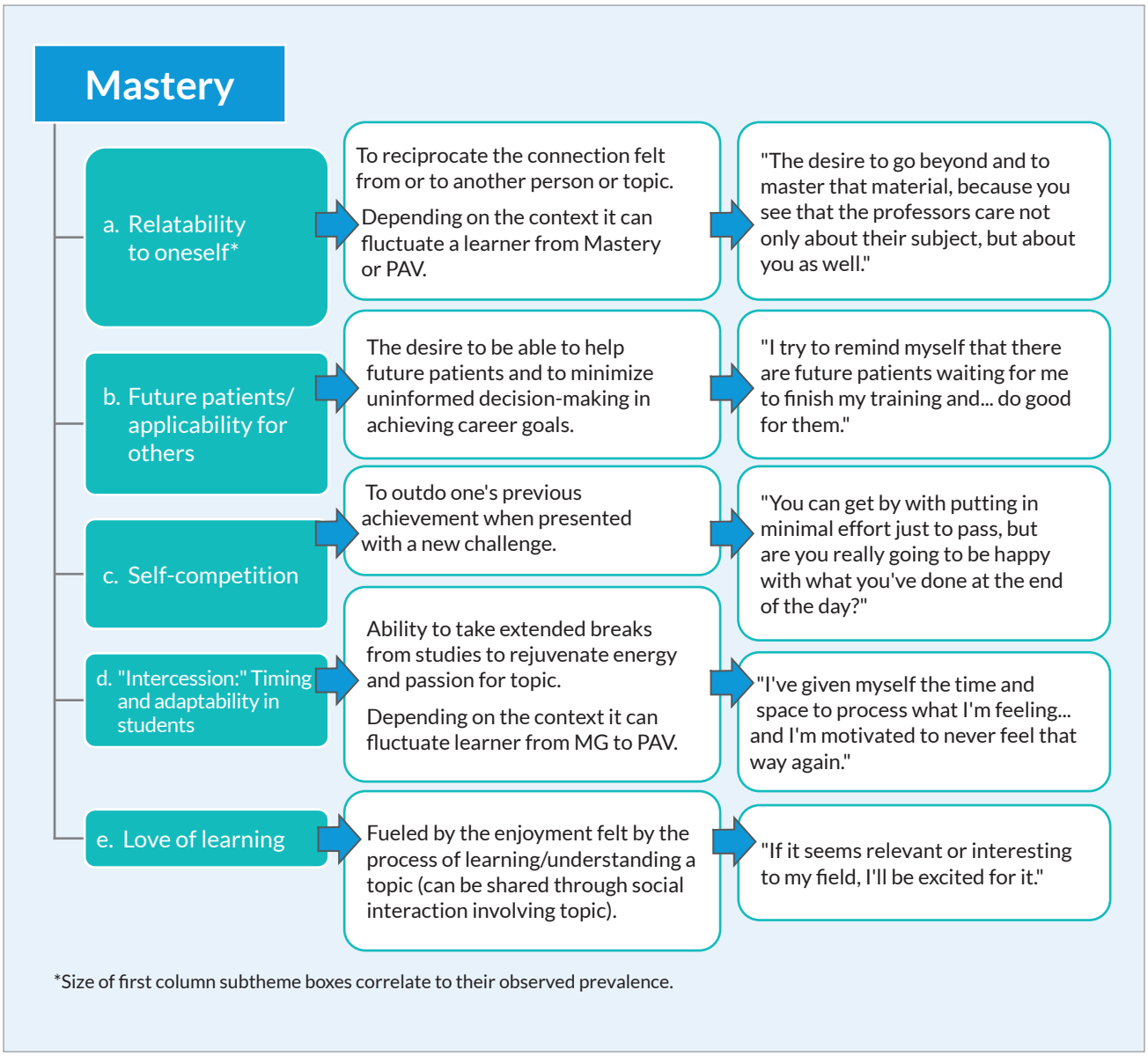

Figure 1: Mastery subthemes

> *If I'm below average or like just a little bit above average, I'm like ugh, that wasn't too good… I feel so self-conscious just by comparing myself to the class in general. (Interview 5)*

Accountability (PAP)

This was seen in group settings where learners displayed competence to each other. Both parties have an expectation and desire to succeed together, creating a synergistic learning environment where learners are motivated to perform their best individually and as a group.

> *(Colleagues) can motivate you to do better… interacting with another person is more high yield…one party is creating the question and the other is trying to understand what the question is asking for and trying to get the answer. (Interview 10)*

"One Team" approach (PAP)

This subtheme describes the belief that peers are working as a team and led by the desire for everyone to succeed. The sense of camaraderie from this mindset allows individuals to take failures less personally and stay positive throughout the learning process.

> *People around you that you're supposed to be collaborating with… a lot of them are going through the same thing that I'm going through…It's reassuring to me that maybe I'm not doing something wrong. (Interview 2)*

"One Person" approach (PAP)

In contrast to the above subtheme, the One Person subtheme describes the belief that peers are competitors. This view places pressure on individual performance and the ability to outperform their peers. The motivation presents as a heightened sense of competition in group settings.

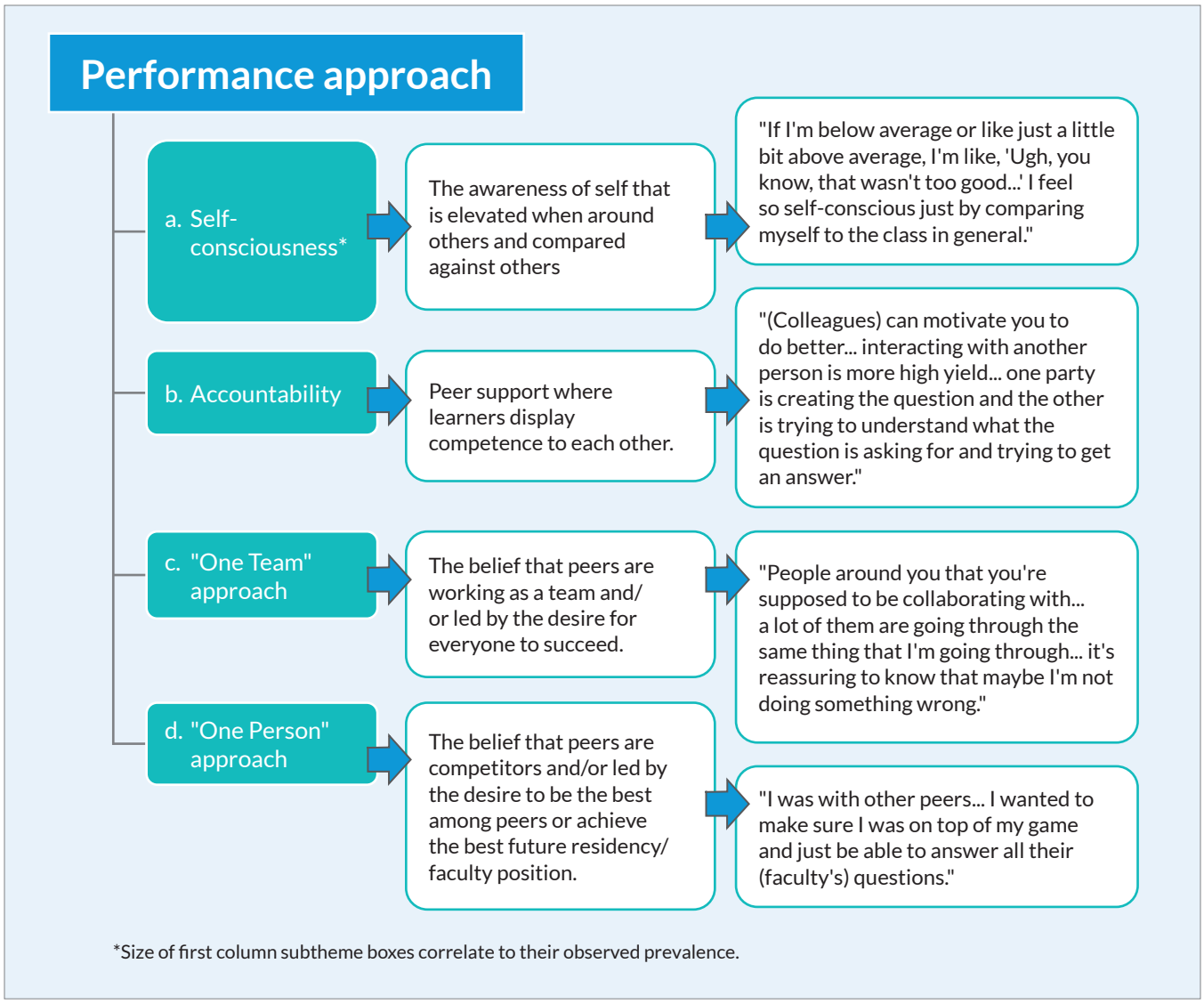

Figure 2: Performance approach subthemes

> *I was with other peers…I wanted to make sure I was on top of my game and just be able to answer all their (faculty) questions. (Interview 7)*

Performance avoid orientation themes

Fear of disappointing self/others or the "Imposter Syndrome Effect" (PAV)

This subtheme describes the protective mechanism whereby an individual (the imposter) has difficulty with accepting achievements as products of their own efforts; they believe that they have merely just avoided failure. This mindset forces the learner to compare their competency to an unrealistic standard set by their self-judgment and self-consciousness. Instead of learning for the sake of learning, students struggle to avoid failure.

> *The last thing you want to do is get here, finally be able to say that you were in medical school and then fail out. (Interview 1)*

"Immediacy": prioritizing in a high pressure/workload environment (PAV)

Desperation serves as a motivator when students must complete a task under a heavy workload or time pressure. Students choose to meet minimum passing requirements over mastering material. This is preferred when students feel they are unable to meet a timeline. They default to the option of passing rather than rising to meet a higher personal or external standard.

> *When there's a lot of material and it's hard to organize … okay, let's just make sure I not fail this part of the course. (Interview 3)*

Context dependent on topic/learning environment (PAV)

Students were more likely to resort to PAV orientation when there was a lack of breaks in between learning, interest or relevance in the topic being covered, or relatability to the lecturer.

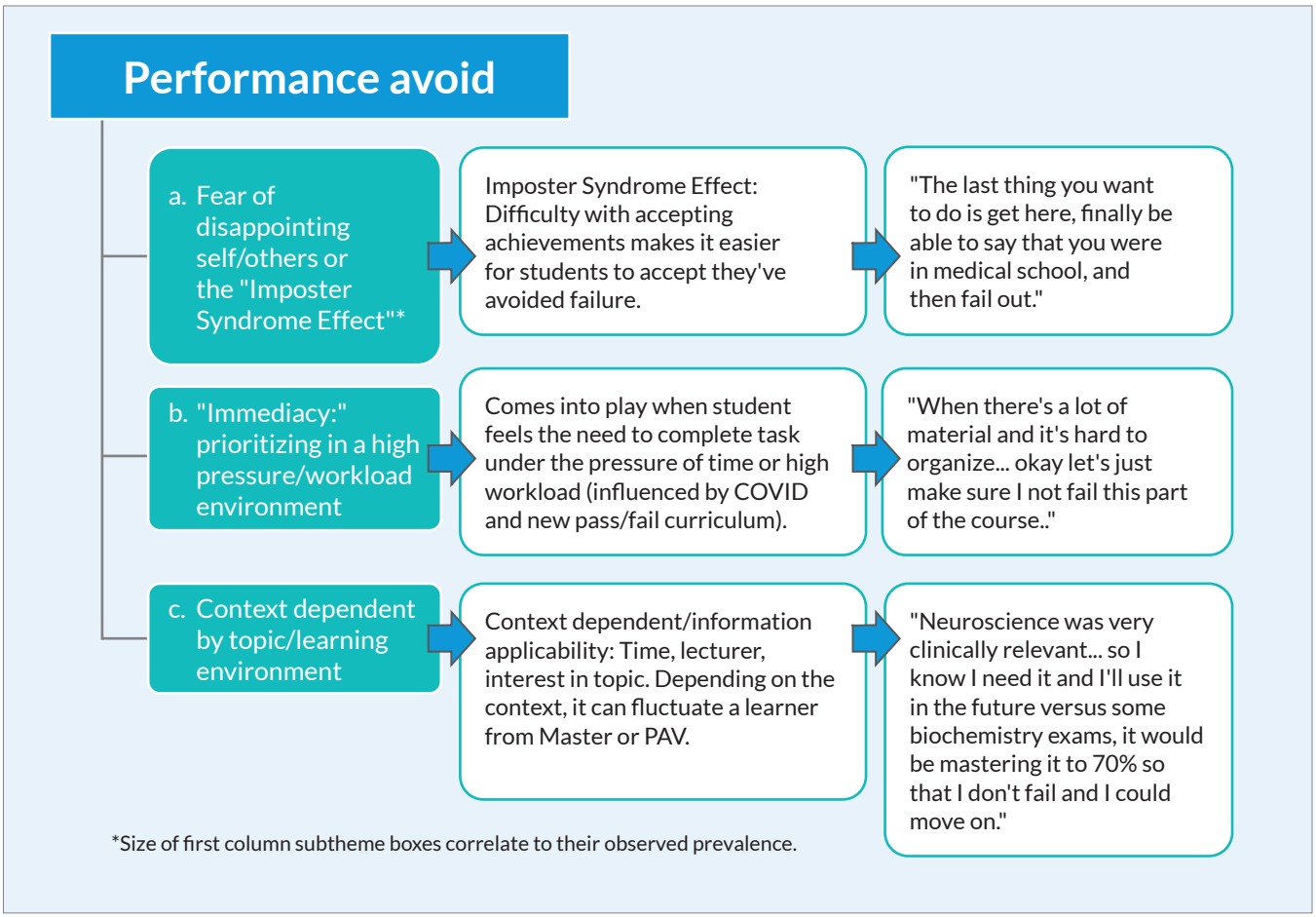

Figure 3: Performance avoid subthemes

> *Neuroscience was very clinically relevant... so I know I need it and use it in the future vs some biochemistry exams, it would be mastering it to 70% so that I don't fail. (Interview 5)*

Discussion

This qualitative study on the manifestations of GO in pre-clinical medical students demonstrates that GO constructs are dynamic and largely context dependent and that mastery is predominant in preclinical medical students. Interestingly, across all three GO domains, the highest subtheme expressions relate to self-image. These include Relatability to Oneself (MG), Self-consciousness (PAP), and Fear of Disappointing Self/Others (PAV). These results suggest that self-concept and self-efficacy have a greater impact on motivation orientation than environmental and social influences. Self-concept is the general view of oneself. Self-efficacy is confidence in one's ability to face future challenges and serves as a precursor for self-concept development (14, 15).

These results connect goal orientation theory with self-determination theory by showing that participants with high self-efficacy and an internal locus of control are more likely to express mastery orientation (16). Participants with external loci are more likely to consider their performance in context of others, which aligns with the performance orientation types. It is also notable that participants with low self-efficacy more commonly experience imposter syndrome by attributing achievement to forces outside their control (PAV: Fear of Disappointing Self/Others or the "Imposter Syndrome Effect").

Despite the influence of self-efficacy in achievement, few educational interventional studies have successfully examined this experience in medical students (17). This is primarily due to incomplete understanding of the conceptual underpinnings of self-efficacy and validity measurements in academic settings (17). Past studies reviewing self-efficacy in the context of motivation were centered around sports performance. A 1991 study of male runners showed that at competitive track races, athletes assessing their self-efficacy by peer comparison had a more accurate representation of their performance outcome than those focused on self-competition (18). However, peer comparison appeared to undermine self-efficacy. These findings exhibit the duality of performance outcome accuracy and negative self-confidence associated with performance-based orientations. Similarly in PAV subtheme "Immediacy," students pressured to meet an approaching deadline preferred PAV over MG to attain time-sensitive goals. Students chose to meet minimum requirements over fully learning material when they perceived time as a scare resource. Though both orientations, PAV, and MG, may lead to similar short-term results, the

mounting cognitive effects of each orientation on student self-efficacy can spell out the difference between success and failure in the long-term.

Unlike a race in which there is immediate feedback on tasks, the medical curriculum is focused on building resiliency in students over time. The knowledge and confidence to take on patient cases in the ward requires sturdy cognitive performance. Therefore, when considering the value of self-efficacy for preclinical students, forming a self-concept that is more future-oriented and focused on long-term growth (MG: Future Patients/Applicability for Others) is likely more sustainable to maintaining student motivation than one that is influenced by immediate environmental factors (PAV: "Immediacy:" Prioritizing in a high pressure/workload environment).

In a 1993 study of competitive swimmers, labels of efficacy were randomly assigned. It found that congruence between learning habits and self-concept decreased mental distress in goal achievement (19). Likewise, medical students that expressed fears of failure (PAV) exhibited low self-confidence in their ability to successfully prepare for exams despite the absence of past failures. These students experienced decreased self-efficacy and increased mental distress through imposter syndrome and anxiety toward negative feedback.

The present study also describes the orientation switching that occurs in pre-clinical medical students. Both consciously and unconsciously, learners fluctuated between Mastery (MG: Relatability to Oneself, "Intercession:" Timing and Adaptability in Students) and Performance Avoid (PAV: Context Dependent by Topic/Learning Environment) depending on the learning environment. Though both orientations lead to competency, mastery orientations are associated with positive, higher metacognitive learning habits and challenge-seeking behavior (2). Performance Avoid orientations are associated with self-protective behaviors that impede optimal learning (20). It is possible that this polarizing switch is a form of burnout seen with suboptimal learning style or incompatible learning environment. Therefore, educational interventions should focus on addressing factors that appeal to MG expression such as increasing the availability of breaks between blocks, facilitating lecturer/learner interactions, and emphasizing clinically relevant portions of a lesson.

According to the 2020–2021 data from the Liaison Committee on Medical Education, over 80% of medical schools within Canada and the U.S. have adopted pass-fail curriculums for pre-clerkship course grading (21). These changes are made to minimize stress from grade point averages as measurements of success and rank (22). However, defining the minimum passing requirements allows students to avoid failure (PAV) instead of striving beyond what is required (MG). Because PAV is associated with negative learning habits, it is worth following the prolonged effects of this curriculum change on individual coping mechanisms and motivation.

This study is limited to data from students at a single institution. Therefore, results may be biased by the educational curriculum specific to Geisinger Commonwealth School of Medicine (2020–2021). However, by focusing on the non-clinical experiences of the pre-clinical curriculum, we hoped to minimize this bias as the curriculum is similar to that of other American medical schools. Additionally, attitudes and experiences may have been heavily influenced by the learning environment unique to experiences from the COVID-19 pandemic. Future studies will investigate the manifestations of GO in clerkship (third- and fourth-year) medical students, given the unique pressures of learning in the clinical environment. In addition, we seek to develop a novel instrument to measure GO patterns in all medical students to gain a greater understanding regarding the relationship of GO patterns with the clinical learning environment, wellness, burnout rates, and influence on specialty choice.

Conclusion

By analyzing individual responses to achievement and failure in education, this study has provided a unique insight into intrinsic motivation using the goal orientation framework in pre-clinical medical students. Mastery vs. performance achievement goals are influenced by context-dependent self-efficacy. Moving forward, we would like to examine the learning environment contribution to the goal orientation mindset as well as methods to maximize learning efficacy and minimize maladaptive strategies.

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