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# On the State of Premedical Education and the Self-Selection Criteria of Premedical Students

Many, aspiring new undergraduate students enter the field of academia with the dream of spring-boarding into the health and medical fields. These ambitious, motivated students want to become the modern world's healers; they want to touch people's lives and fulfill their dreams of becoming doctors. However, many of these students brutally discover that this life-long career choice is both arduous and self-destructive for all but the most dedicated of students. Indeed, the road to doctorhood may be littered with moral pitfalls and the dreams of the super-majority (60%) that fail to make it (Olsen 74). Even so, all of the fault is not on the students, as the current literature shows that colleges and universities do not guide premedical students on the academic, social, and moral battles needed to win entry into medical school.

Freshman who want to purse health professions already come from high school with serious disadvantages. On average, they enter college with only a fractional idea of what career to pursue, but in the case of premedical students, without a good road map of what to learn and how to learn it. As stated by Arum, a sociology professor at NYU, "Although growing proportions of high school graduates are entering higher education, many are not prepared for college-level work and many others have no clear plan for the future... students proceed to higher education regardless of their academic performance" (Arum and Roska 9). Still, even for those who select premedical as their path and commit to it, the earliest hurdles are introductory chemistry and biochemistry courses. Both of these are difficult not just due to nature of the subjects, but also because they are often taught poorly. Cooper, the Chemistry department head of Michigan State, noted that although premedical students go through almost two and a half years of chemistry, the inter-relationships between the concepts between classes do not form. She argues that a plurality

of these students go through the motions of classes via rote memorization, but come of their time without understanding the applications of chemistry. Instead of building the bonds between the atomic to the biochemical, “Students see each step in the process as separate, and are often tested on them separately so that they do not see their overall purpose or value.... students must have relevant prior knowledge, new material must be explicitly connected to that prior knowledge” (Cooper 821). While this trend of memorizing over synthesizing seems like it might be due to some negative trait of premeds, further literature shows, that, on the contrary, premeds are trying more than others to understand and grasp the ideas.

One study conducted on the motivations of pre-meds was by Horowitz, a former associate professor of chemistry at Brooklyn College. He performed a study via a series of random selections and interviews, selecting only from the 2009 class that had self-indicated as ’Premed.’ In this, Horowitz found that “Only a small number of students (4 of 31) indicated that grades were all that mattered to them” (Horowitz 227). To the contrary, further surveying found that many of them desired to master hard STEM courses, and saw that “[D]oing well in pre-med courses was not sufficient ... that the real reason for wanting to learn the premed course material was simply in order to do well on the Medical College Admission Test” (Horowitz 230). So even though the research shows a plurality of these students desire to intrinsically understand their course material, the structure and learning objects in place by school administration solidly prevent this. For example, Arum criticizes the over reliance on ‘fact’ based multiple choice exams and notes how short-lived the learning for these exams can be. He calls for a return to emphasis on free response and open ended questions, and that “While [students] may be acquiring subject-specific knowledge ... many students are not improving their skills in critical thinking, complex reasoning, or writing” (Arum and Roska 14). All of Arum’s learning metrics, which universities currently fail to meet, are also the cornerstones of the Medical College Admission Test, or MCAT, the final challenge that colleges also leave their students to fight without guidance.

The MCAT acts as the ultimate dividing line between the upperclassmen who were planning to apply to medical school and the upperclassmen that actually do apply. However, the

question arises if its a metric that universities can even help their students in? In an hyper competitive applicant pool, "[T]here were 47,815 applications to medical schools, and only 20,343 student matriculated. The average GPA for a matriculated student was 3.69" (Olsen 74). Thus, one of the only ways to stand against the competition is to do above the 75th percentile of accepted students. This is hardly an easy feat, as the exam is 7.5 hours in length and challenges both depth and breadth of an applicants knowledge. Olsen, a Sociology professor at UC San Diego, describes the nature of the beast, stating that "The first two test the applicants' knowledge and use of concepts in biology [and] chemistry... The second two test the applicants' knowledge, use, and critical analysis of behavior and sociocultural determinants" (Olsen 72). Olsen uses the new, extended nature of the 2015 MCAT revision to argue that premedical students can stand to gain from focusing on their sociology classes and other 'soft' science lectures; Olsen also strongly claims that these classes can help a student become effective doctors. Olsen makes it a point to praise the added rigor to the reading and critical thinking components as a reminder that if doctors were trapped in only biochemistry classes, they would be unable to humanize their patients (Olsen 81). On the contrary, Cooper argues from the perspective of a STEM educator against the MCAT, as "Unfortunately, the proposed chemistry learning objectives [in the 2015 MCAT] do not seem to provide a coherent framework with which to work. Rather, these objectives are fragments, disconnected ideas" (Cooper 820). As Cooper also argued that the structure of current chemistry intro classes was fundamentally flawed, Cooper concedes that students can either learn chemistry as professors teach it (reductionist), or learn it holistically for the MCAT, but not both. Thus, the literature does not agree on if schools can directly help their students survive the MCAT, but the literature on premeds paints an even bleaker picture on where schools do fail: the social lives of premeds.

On top of the high likelihood of failure in classes and on the MCAT, the area premeds students need the most help in is being provided avenues to positively socialize with each other. One earlier study on the lack of positive socialization of premeds was conducted by Anaya, a statistician at Indiana University. She took a sample of 425 medical school applicants compiled

by UCLA and the American Council of Education, and ran analysis that looked for the strongest factors contributing to medical school acceptance while controlling for factors like gender or race. She noted that time was a luxury for these students, due to the costly “Investment of their time and energy in decision making, [which] is guided by the dream of becoming a doctor. The array of decisions and necessary tasks to meet this goal ... indeed requires considerable thought and energy” (Anaya 179). Anaya noted that any time spent outside of classes or organizations that help premeds are treated as negative factors by students, themselves. Even more worrying, the students passing the first round of applications are those that sacrificed work and roles in student clubs, perhaps only to cram more hours for studying. For example, she exclaimed “[C]o-curricular activities are negatively associated with student learning as measured by performance on the MCAT. Student involvement in college clubs and organizations (-0.20, p ¡ 0.05) and working for pay (-0.09, p ¡ 0.01) appear to hinder student learning” (Anaya 188). This suggests that those who choose, or need, to work and socialize, are looking at performance between 10% to 20% worse than their peers who focus only on studying. However, the lack of life-study balance is only made worse by the negative stereotypes premedical students hold for each other.

A large array of past and modern literature suggests that premedical students do not trust one another. There is an overarching, inter and intra-cultural belief that premeds are cut-throat to a fault, and that ”[T]he stereotype persists not only among non-premeds and faculty, who view premeds as less mature, creative, honest, and humane than non-premeds, but also among premeds themselves who see themselves as more anxious, less socially active, and less politically conscious” (Olsen 74).

# Works Cited

Anaya, Guadalupe. “Correlates of Performance on the MCAT: An Examination of the Influence of College Environments and Experiences on Student Learning”. *Advances in Health Sciences Education* 6.3 (2001): pp. 179–191. Web.

**Annotation**: Anaya performed statistical analysis to see if there was any correlation between MCAT scores and success in Medical Schools. She found, even when controlling for socioeconomic backgrounds, race, and gender, that the perceived rigor of the incoming student’s undergraduate school and MCAT scores were the most influential factors for predicting success in Medical School.

Arum, Richard and Josipa Roska. “A Lack Of Rigor Leaves Students ’Adrift’ In College”. *National Public Radio* (9 Feb. 2011): pp. 1–14. Web.

**Annotation**: Arum and Roska surveyed tens of thousands of first year and fourth year American college students to measure if college improves writing and critical thinking skills. Arum and Roska found alarming trends that the majority of incoming freshman were not prepared by high school, and that a majority of American undergraduate students leave ’adrift,’ that is without purpose or reason for their education.

Cooper, Melanie M. “The New MCAT: An Incentive for Reform or a Lost Opportunity?” *Journal of Chemical Education* 90.7 (2013): pp. 820–822. Web.

**Annotation**: Cooper argues that the new 2015 revisions to the MCAT call for a system wide overhaul of how introductory and organic chemistry are taught. Cooper argues against following the Medical College Admissions Test learning guidelines, stating that instead the MCAT encourages a broken, mishmashed view of chemistry. Cooper ends on the note that the current circula fails to instill pattern recognition of chemical structures and resultant behaviors, but that catering to the new MCAT’s criteria will not fix this problem.

Doering, Alex, et al. “The Undergraduate Hospice Experience: A Way to Teach Pre-Med Students the Importance of Compassionate Patient Care (S725)”. *Journal of Pain and Symptom Management* 49.2 (2015): pp. 420. Web.

**Annotation**: Doering studied and observed the learning experiences of premedical students who worked in hospices, which are end-of-life facilities. Doering noted an incredible growth in both introspection and the ability to empathetically give patient care in these students.

Horowitz, Gail. "It's Not Always Just About the Grade: Exploring the Achievement Goal Orientations of Pre-Med Students". *The Journal of Experimental Education* 78.2 (2010): pp. 215–245. Web.

**Annotation**: Horowitz studied and surveyed several hundred Premedical students at an all male, Jewish college. Horowitz found that while some premedical students were primarily motivated by getting high grades, these students were a minority. A plurality of students were motivated in-part or entirely by a desire to master their classes so as to become better doctors.

Olsen, Lauren D. "'It's on the MCAT for a Reason': Premedical Students and the Perceived Utility of Sociology". *Teaching Sociology* 44.2 (2016): pp. 72–83. Web.

**Annotation**: Olsen argues for the continued importance of Sociology classes and the humanities component of the new, 2015 MCAT. Olsen argues that if doctors are trained with only science and reductionist biochemistry, they will be unable to introspect on their societal roles, or worse, be unable to treat their patients with human dignity.

Spencer, Andy, et al. "Cheating At Medical School". *BMJ: British Medical Journal* 322.7281 (2001): pp. 296–299. Web.

**Annotation**: The British Medical Journal's team of editors exposes the rampant cheating in and before medical school, and debates the ramifications and solutions to the underlying problems.