Mapping Minds for Prime Performance:

The Role of Psychological Traits in Academic/Athletic Performance of D1 Student-Athletes

Word count: 5493

Abstract

This research project will investigate what shared psychological traits, if any, correlate with successful performance in both academics and athletics for collegiate student-athletes. This particular study uses the example of male collegiate rowers in Division I athletic programs, a choice which will be elaborated on later. Although every academic institution and every sport presents different experiences, the defined focus of this study eliminates potential complexities that could disrupt the coherency of results. The results of this research establish a baseline for the understanding of the larger topic of evaluating collegiate student-athletes, something yet to be studied in-depth, and thus can be taken as a 'jumping off point' to provide directions for future research in the field. There is no shortage of research modeling the psychology of a successful college student, or the physiology of a successful college athlete. However, what research exists regarding the psychology of successful athletes primarily addresses athletes at the elite level (i.e. professional, Olympic) and does not account for the unique circumstance of a collegiate student-athlete, for which both academic and athletic commitments are central to one's identity and schedule. This gap in knowledge offers the opportunity to develop coaching methods at the collegiate level to more comprehensively take into account not only the physical characteristics of athletes but also their mentality and psychological aptitudes. With this holistic, conscious approach to student-athlete evaluation, selection, and training developed from this research, bridging the gap between success in athletics and academics with psychology, this research can contribute to the ultimate goal of any coach: to maximize efficiency, both in coaching effectiveness and athlete performance. This study can be defined as a qualitative and quantitative correlational study of prominent psychological traits and performance in athletics and academics as a two-part survey administered to the aforementioned demographic of collegiate

student-athletes, thus allowing for inductive reasoning in pursuit of a final conclusion. One part of the survey consists of a self-report inventory designed to be scored in order to distinguish the particular traits that are most prominent in the subject, acting as the qualitative portion of analysis. Following that, the second part of the survey consists of a set of questions requiring numerical answers, all in regard to the subject's academic background (ie year in university, current and past GPA) and athletic background (ie rank on the team, years of experience prior to university, amount of awards or distinctions earned while in university). These responses are quantified into a numerical score that designates a certain level of success (the specifics of this process will be detailed later), acting as the quantitative portion of analysis. These two elements are compared through the examination of qualitative psychological traits present in subjects who are designated with a high quantitative score of success in both academics and athletics, with the intention of identifying if there is any correlation. Surveying student-athletes themselves allows for direct observations of those to whom this research intends to apply, making them the ideal subjects to study. Depending on the levels of success reported in both disciplines by the subjects, I hypothesize that there will be at least one shared trait that fits with a correlation between performance in academics and athletics, due to the high level of commitment to both school and sports required from collegiate student-athletes.

Introduction

This research project examines what psychological traits, if any, correlate with successful performance in both academics and athletics for collegiate student-athletes. In particular, this study uses the example of rowers at Division I universities, which allows for a more focused inquiry to address the aforementioned query.

The choice to study this particular topic was a particularly personal one. Being a student-athlete is deeply tied to my identity– I started rowing around the age of twelve, then became a coxswain on the varsity men's team, eventually being recruited to a D1 university team. As I find myself further invested in rowing, the analytical intrigue of the sport has been supplemented by academic research.

My involvement in academic research was most influenced by my studies in AP Seminar. The most impactful source I encountered was "The cultural evolutionary trade-off of ritualistic synchrony", which describes the positive and negative functions of ritualistic synchrony, which it defines as actions in which "human groups engage in synchronous behavior during communal rituals…including synchronous dancing, singing, chanting, drumming or marching" (Gelfand et. al., 2020). These actions encourage cooperation and coordination among the group, as well as a pattern of behaviors of obedience and groupthink. I compared its conclusions with my experience on my rowing team, as not entirely unlike dance, rowers repeatedly move in a synchronized way towards a common goal, which fits within the definition of a 'ritual' as an action, behavior, or process that is repeatedly and invariably enacted with little to no infrequence or alteration (McDonald, 2004).

My interest in the study of rowing itself was entertained by various biographical accounts and technical works. I found a particular interest in the evaluation of the performance of rowers

as explained by certain measurable factors, something detailed in *The Biomechanics of Rowing*, which offers, "insight into the technical and tactical aspects of rowing…a careful analysis of millions of data samples, and comprehensive biomechanical modeling with the aim of finding an optimal balance of variables" (Kleshnev, 2020). This opened my eyes to the ways athletic performance can be improved based on data-backed proof. However, its inquiry is limited to elite-level athletes. As a soon-to-be collegiate student-athlete, I sought studies that applied specifically to my identity. All considered, my choice for the topic of this research project was a toss-up between a few different possibilities. In particular, I was equally as interested in the evaluation of athletic performance, the application of psychology to groups that perform a particular action, and the connection between athletic and academic performance for collegiate student-athletes. I eventually realized that these ideas were not mutually exclusive.

It was this realization that ultimately brought me to my research question: What shared psychological traits, if any, correlate with successful performance in both academics and athletics for collegiate student-athletes? This question weaved each of my desired potential topics into one cohesive area of inquiry. It involves the evaluation of athletic performance that I found so fascinating in comparison with evaluated academic performance, along with the application of psychology to analyze the student-athletes who participate in both disciplines. Finally, and perhaps most critically, the findings of the previous two inquiries and the identity of the subject with which they are concerned acted to bridge the gap between athletic and academic performance. All considered, I was led to a research question that was comprehensive and cohesive, as well as applicable to my endeavors.

Chosen Method

The method I chose was a combination of qualitative and quantitative approaches within correlational research. This involved qualitative analysis through the examination of particular psychological traits of subjects accompanied by a quantitative evaluation of performance in athletics/academics by algorithmic means. The correlational factor comes from the application of psychological traits to subjects who reported high numerical scores of success, with the intention of identifying a relationship between these variables.

I found it necessary to include all three aspects of this method in my study due to the matter with which it is concerned. Personal identity isn't defined by numbers, but instead by behaviors and personalities. This belief made me certain that my evaluation of psychological traits must be a necessarily qualitative measure. However, when it comes to performance, evaluation is most clearly done with numbers. Ranking on a team, competition results, etc all are quantitative.

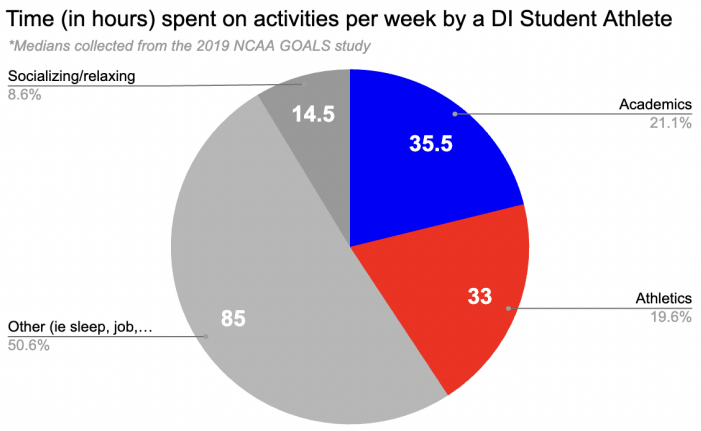
Though I recognize that GPA has been proven to be neither the only nor the most favorable measure with which to evaluate performance (Johnson, 1997), it fits into the field of performance evaluation, as proved by studies that recommend GPA in studies of athletic performance, with results indicating that, "GPA to date is typically the covariate that explains the most variance in academic performance" (Bacon & Bean, 2006). Knowing this, along with past studies which have evaluated performance using GPA with consideration of Big Five traits (Poropat, 2009), I believe that my method is best equipped to analyze possible correlations between evaluated levels of performance with psychological traits in accordance with the goals of my research: To understand if there are shared traits among student-athletes who perform at a

high rate of success in both academics/athletics and if there are, to establish how to encourage the development of these traits in student-athletes.

The first potential limitation of this study is the focus on rowing, as opposed to other sport(s). While there are definitely significant differences in the experience of an individual; depending on the type of sport participated in — a figure skater would likely have quite a different experience than a rugby player, etc — but rowing was chosen because it allows for a specific, effective evaluation of highly competitive and frequently high-performing athletes. In rowing, there is no "professional rowing league". While football players can sign to NFL teams after university, there is no equivalent in rowing. Thus, college is often the highest level of competition reached. Additionally, it's a high-commitment, "training-intensive sport" that practices 10-14 times per week (Kellmann, 2010) which requires particular dedication to performance.

Literature review

The specification of analyzing collegiate student-athletes has particular importance in the identity. According to the NCAA, the average D1 student-athlete spends about 33 hours on athletics and 35.5 hours on academics in a week, a nearly equal distribution (NCAA, 2019).

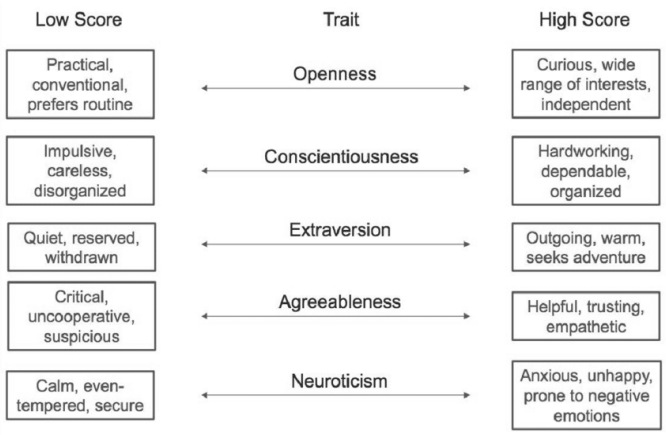


Given the high demands of student-athletes, their circumstances make them a unique demographic, opening the opportunity for specific study into what factors correlate with their performance, such as psychological traits. Perhaps if there is a correlation between certain traits and successful performance, athletes could learn to better approach these time commitments.

In pursuit of a further understanding of performance evaluation, psychological profiling aside, there are a number of evaluation models for athletic performance. One such model is in "An 8-factor model for evaluating crew race performance", an article by a group of experienced athletic performance researchers, specifically pertaining to rowing (Cornett et. al., 2008). This introduces a model to evaluate and analyze the performance of rowing crews in races, simplifying and categorizing various factors of performance that had not previously been presented in a unified theory. It considers variables that play into success in rowing, including some psychological and non-physical factors, unlike other models focusing solely on physiological/biomechanical performance, such as *The Biomechanics of Rowing.* Despite having limited use for psychological analysis and no relevance to academic performance, this source confirmed that it was possible to evaluate athletic performance with certain psychological factors taken into consideration.

Once I understood how performance could be evaluated, I was faced with the matter of specifying what 'psychological factors' I would be looking for. I considered developing my own qualitative measure of psychological evaluation involving open-ended questions that I would analyze for patterns, however, given the time constraints of the AP Research course and my limited experience in the field of psychological analysis, I decided it would be more reasonable to consult pre-existing literature on the subject. In researching the topic of psychological traits, I found the most effective and applicable model to be Big Five personality traits, originally created

in 1949 as a theory of psychology in which traits are divided into five distinct dimensions (Fiske, 1949):



In terms of how they could be evaluated, I found the best model to be the Big Five Inventory (BFI), defined by its developers as "a self-report inventory designed to measure the Big Five dimensions… consist[ing] of [44] short phrases with relatively accessible vocabulary" (John & Srivastava, 1999). Each phrase addresses a potential point of identification for a subject, such as "I see myself as someone who is a reliable worker" which subjects rate their degree of agreeance from 1 (disagree strongly) to 5 (agree strongly). These responses are then scored through an algorithmic system which results in a score corresponding to the degree of each trait's prominence for the given subject (i.e. the aforementioned question corresponds to high conscientiousness). The BFI showed me that I could evaluate psychological traits in a qualitative yet clearly analyzable way. By choosing to employ the BFI in my method design, I was able to shift my research to more directly address what "psychological traits" my research question refers to, and more effectively reach a conclusion.

To synthesize the previous two sources, I found an incredibly useful source in sports psychologist Dr. John Perry's *Sport Psychology: A Complete Introduction* (Perry, 2015). Aside from establishing the baseline for my understanding of sports psychology, Perry references Big

Five traits and describes their application in sports settings. For example, a high extraversion individual would be likely to pursue leadership roles such as team captain, though their assertiveness can make them prone to instigate conflicts among teammates and form poor athlete-coach relationships. This proved that Big Five traits can be applied to athletics, bridging the gap between psychological traits and athletic performance and fortifying my understanding of the qualitative applications of my inquiry.

Overall, these sources served to form the baseline for the analysis of my inquiry. Analysis of the time commitments of a collegiate student-athlete confirmed the demographic that I aimed to address with my research, emphasizing the unique circumstances of athletics in addition to being a student. The "8-Factor Model" established that performance of such athletics could be evaluated with consideration of psychological factors, confirming that it would be possible to analyze performance with psychology in mind, and the BFI defined the psychological traits in question, along with providing direction for how to evaluate which traits would be most prominent in a subject. Finally, *Sport Psychology* proved that Big Five traits could be applied to the psychology of an athlete, leading me to develop an effective analysis process in my methodology. The various literature examined helped to form a methodology for my specific inquiry, in which I would analyze which Big Five traits, if any, most prominently correlated with performance that has been evaluated to show a high level of success, all as it applies specifically to collegiate student-athletes

Methodology

Participants

In terms of demographics, I originally reached out to 12 different Division I rowing programs, about a third of the 35 D1 men's rowing programs in the country (Athletic Scholarships, 2023), aiming to consider a variety of different university rowing programs with different performance histories and different team GPA averages within those programs. After many outreach attempts, I received responses from six coaches, three of which declined to participate at some point in the process. While I originally intended to have more teams participating, the specificity of evaluating three different teams allowed for a closer analysis of the demographics between specific schools and programs, simplifying the procedures of comparing and minimizing the complexities that could have come from many more programs participating, as well as allowing for clear and effective organization and data analysis of an appropriate number of subjects given the time constraints of working with AP Research deadlines. The programs that did participate were still diverse in character, composed of 38% Brown University, 31% Cornell University, and 31% University of San Diego.

Materials & Procedures

The distribution of my survey was a particularly important factor in my research process. In my experience with competitive rowing, I knew that any potential distraction — such as an entire team being contacted to participate in a survey for a high schooler's research project — could negatively affect training, and thus would be looked down upon by coaches. However, with the approval of coaches, I would be able to collect data from collegiate teams with minimized risk of affecting their training or encountering objection. Knowing that university

rowing coaches often visit my home club to scout out potential recruited athletes, I took every opportunity to briefly meet with each in person to pitch my research. For those who responded positively, I recorded their contact information, provided more information over email, and requested active consent once again via an online form. Once consent was confirmed, I provided some brief information about the survey — including emphasis on the anonymity, confidentiality, and voluntary nature of participating — and the link to complete it through a Google Form, which the coaches then forwarded to the athletes, making the process efficient and ethical.

Within the survey, subjects were first asked to confirm that they fit the criteria of qualified participants for this study:

Anyone who meets the following criteria is qualified to participate:

- ☐ Is currently enrolled as an undergraduate student
- ☐ Is a registered member of the team
- ☐ Attends regular practices with the team
- ☐ Is a rower (not a coxswain or a coach/staff member)

Any subjects who indicated that they do not fit one or more components detailed in this list were redirected from the survey and informed that they are not qualified to participate and cannot continue, though their interest is appreciated. All data ultimately used in the final product of this research is from student-athletes who have confirmed that there are none of the aforementioned list items that do not apply to their identity.

Preceding this, participants were prompted to confirm that they consent to participate, which ensures active consent is confirmed:

Please confirm that you consent to participate in this study, which involves answering regarding your past academic and athletic results:

- ☐ I consent (by checking this box, you are confirming that you consent to the use of your answers to the following survey in this study)
- ☐ I do not consent (by checking this box, you are choosing not to participate in this study and no further questions will be asked)

Those who indicated that they do not consent to participate were redirected from the survey and reminded that their choice to participate or not to participate is completely confidential and that none of their information will be stored or shared in any way. Those who indicated that they do consent were directed to continue with the survey.At the end of the survey, they were reminded once again that their choice to participate or not to participate is completely confidential and no information entered in the survey will be available to anyone other than those conducting this research.

Survey Analysis

The two-part survey that subjects filled out included the BFI questionnaire, as well as a personal evaluation survey. The BFI portion acted as the quantitative portion of the data collection, resulting in scores that are interpreted to form a ranking of how prominently each of the Big Five traits appears in a subject's personality. The following personal evaluation survey acts as the quantitative portion of the data collection, which asks for basic information about subjects' rowing background in numerical form (i.e. years of experience, rank on team, etc) as well as unweighted GPA. Thus, the survey incorporated qualitative and quantitative factors of my inquiry, allowing for the opportunity to investigate any relationships between such variables to account for the correlational factor.

This design brings to mind a potential argument against the validity of my research, which is the subjective nature of "success". How can one define "success", when the concept can be interpreted in such a variety of perspectives? I acknowledge that the abstract concept of "success" is entirely subjective. However, for the particular purpose of my research, I found a quantifiable approach to defining "success" to be effective in clearly evaluating the performance

of my subjects. In this specific study, "success" refers to the quantitative level of performance, which is deducted from the following algorithmic methods created to analyze data collected in this research.

On athletic "success"

The athletic "success" level of subjects was simplified by the following equation:

$$AT = |(E - B)| + D(n)$$

In which:
AT: Quantitated athletic performance score
E: Experience in number of years
BP: Boat ranking (first varsity = 1, second varsity = 2, etc*)
*For those unranked due to injury/sickness, this variable is their last reported boat rank, plus 1.
D: Distinctions, as in awards received or selection as captain or co-captain
D(n): Number of distinctions (award received = 1, selection as captain or co-captain = 2, both awards received and selection as captain or co-captain = 3, neither/no distinction =0)

By this logic, the greater the number of AT, the higher the quantitated athletic performance score. For the purpose of simplicity in explanation, this designates the level of "success" in athletics. To provide an example:

A student-athlete who has five previous years of experience, is ranked in the first varsity boat, and has received an award relating to his athletic performance and has been selected as the captain/co-captain of his collegiate team at some point in his collegiate athletic career, would be represented by the following equation:

$$AT = |(5 - 1)| + 2$$
$$AT = 6$$

This represents a student-athlete, Subject A, who has achieved a higher level of success in regard to the sphere of athletics. Conversely, consider a student-athlete who has 2 years of previous experience, is ranked in the third varsity boat, and has not received any distinctions

relating to his athletic career. This student-athlete, Subject B, would be represented by the following equation:

$$AT = |(2 - 3)| + 0$$
$$AT = 1$$

B has a quantitated athletic performance (AT) score of 1, lower than A's AT of 6. Thus, A is considered more successful than B in athletics.

On academic "success"

To evaluate each participant's respective performance in academics, I examined the distribution average unweighted GPAs for each participant. To simplify the comparison of GPA to AT, GPA was organized within ranked ranges on a 6-point scale:

1: < 2.4
2: 2.41 – 2.7
3: 2.71 – 3.0
4: 3.01 – 3.4
5: 3.41 – 3.7
6: 3.71 <

The range level on the scale in which a subject's average GPA falls corresponds to subjects' level of "success" in academics, for the purpose of this research. For example, if A reports an average GPA of 3.68, they would rank 5 on the GPA scale. Conversely, if B reports an average GPA of 2.50, they would rank 2. Once again, A is more successful than B, this time on the academic level.

A consolidated measure of performance

To identify student-athletes who perform at a high level of success in both athletics/academics, subjects were assessed first on the rank of their AT and GPA score, then by the absolute value difference between scores. As previously explained, the higher the score, the higher the level of success in each discipline. Once high-scoring subjects are identified, subtracting one score from the other allows for identification of which subjects performed highly in both disciplines, rather than just one. Since this research is analyzing "successful performance in *both* academics *and* athletics", subjects with a low difference between scores are ideal for the analysis of psychological traits.

Following the same example: Subject A had an AT of 6 and GPA rank of 5. The difference between these scores is 1, confirming that A was highly successful in both athletics/academics and would be ideal for psychological analysis.

Subject B, with an AT of 1 and GPA rank of 2, would have a difference of 1; however, given B was at low-performing in both disciplines, they aren't ideal for psychological analysis.

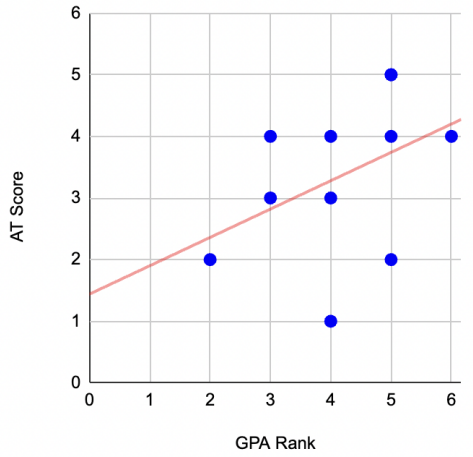
Consider an additional Subject C, who has an AT of 2 and GPA rank of 6. Here, C was low-performing in athletics but high-performing in academics. The difference between these scores is 4, which is too large a variation to be favorable for psychological analysis.

Results & Data Analysis

Quantitative Results

Of all responses, there was no significant trend in AT score reported, and subjects were generally diverse in level of athletic success. 30.8% of subjects scored somewhat high at 4 and 23.1% scored low at 1, while 15.4% scored 5 (high), 3 (medial), and 2 (somewhat low),

respectively. Alternatively, most subjects ranked on the higher end of the GPA scale, with 38.5% scoring high at 5 and 23.1% scoring somewhat high at 4. 15.4% scored 6 (very high) and 3 (medial) respectively, and only 7.7% scored 2 (somewhat low). This indicates that most subjects, regardless of level of athletic success, generally exhibit a high level of success in academics. There was a slight positive relationship between levels of academic and athletic success, meaning subjects who performed well athletically also performed well academically, as shown in the graph below (each point equals one response, some identical responses overlap).

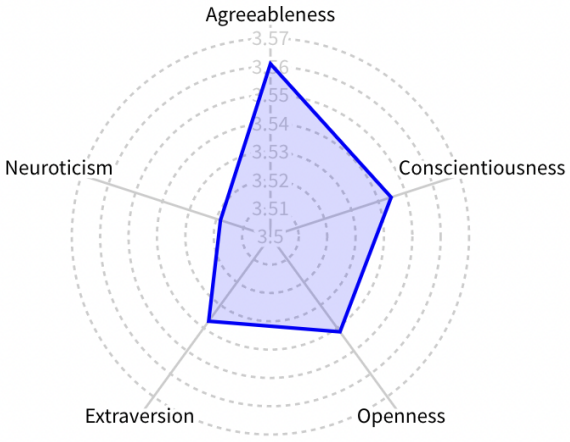


Among all subjects, the majority had little to no difference between athletic and academic performance, with 69.3% showing 0-2 difference between AT and GPA rank. 23.2% showed a difference of 3-5. Of those with 0-2 differences, most (63.5%) performed at a high level of success in both athletics/academics, with the average of their AT and GPA rank placing high at 4+. 25% placed at 3 (medial), and only 12.5% at 2 (somewhat low). This means that most subjects were ideal for psychological analysis, as they showed a high level of success in both academic and athletic performance. These results set the baseline to address my research question by establishing the quantitative portion of my inquiry of subjects who report “successful

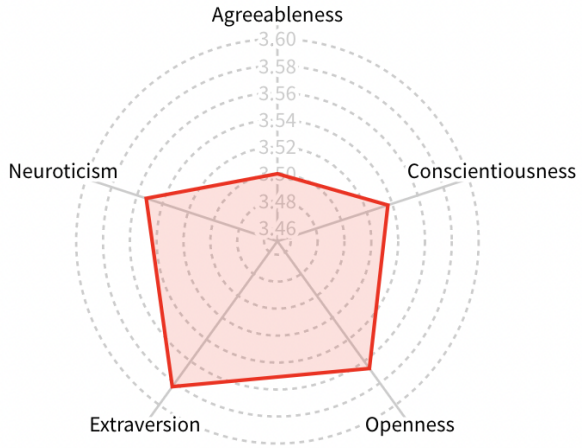
performance in both academics and athletics", so that I may analyze the qualitative portion of "what shared psychological traits, if any" correlate with said performance.

Qualitative Results

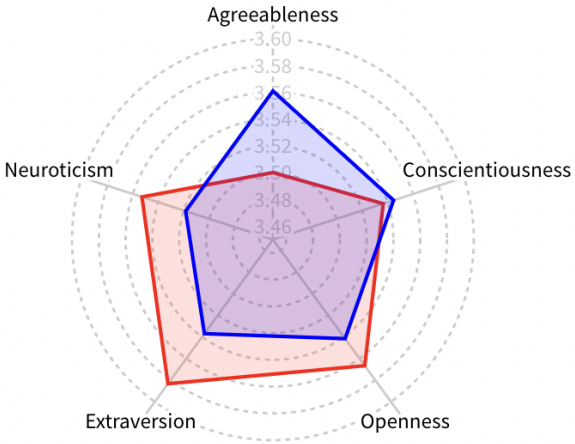
In analyzing the BFI scores of all subjects who performed highly in both disciplines (those with a 0-1 difference between AT and GPA score and average scores >3), I identified a pattern among the top three Big Five traits associated with each subject. On average, the most prominent trait in high-performing subjects was agreeableness, followed by conscientiousness, then openness. The results of each trait are visualized on the radar chart below:



To confirm that there was a correlation between these three traits and high success in both disciplines, I performed the same analysis on subjects who performed disproportionately between disciplines (those with a difference of >2 between AT and GPA score, with GPA largely placing higher than AT) or performed at a low level of success in both disciplines (those with average scores <3). Unlike the high-performing demographic, these subjects displayed extraversion most prominently, followed by openness, then neuroticism. This indicates a distinctly different pattern of Big Five traits associated with low- versus high-performance.:



These results provide qualitative data, the "shared psychological traits, if any", that proves the correlational part of my inquiry. The traits prominent among high-performing (blue) versus low-performing (red) subjects are compared below:



Discussion

Overall, these results prove that there are psychological traits that correlate with success in both athletics/academics for collegiate athletes, those traits being agreeableness, conscientiousness, and openness. These findings are significant to the field of sports psychology

as it applies specifically to collegiate athletes, as they provide a baseline for understanding the mind of a student-athlete, considering how each trait presents itself in an athlete.

In academic settings, these traits would be applied to how their associated behaviors encourage or discourage success. The application of these particular traits has been shown by University of Western Ontario psychologists who find that, “Conscientiousness [has] been found to be especially relevant for the prediction of scholastic achievement...it appears that being achievement-oriented, self-disciplined, and diligent… is beneficial for academic success [and] academic performance has also been found to be positively associated with…Openness” (O’Connor & Paunonen, 2007). This demonstrates that conscientiousness and openness are confirmed to correspond with high academic success in academics, and supports part of my research question, that the aforementioned psychological traits do correlate with success in academics. The same article states that, “few strong relations have been found between academic performance and personality dimensions related to Agreeableness”, however, an alternate study found that, “Disagreeableness items reflect low trust and cooperativeness and amotivation scale items reflect disengagement and poor socialization to academic norms. Thus, disagreeable students may be more likely to display uncooperative or antisocial behavior in the classroom” (Komarraju et. al., 2007). This indicates that a lack of agreeableness would lead to poor academic performance, supporting the academic factor in my area of inquiry.

In athletic settings, agreeableness can be beneficial, as highly agreeable individuals work well with coaches, respond well to feedback, and build positive relationships among team and staff. The collaborative, altruistic nature of agreeable individuals would also lend well to the idea of sportsmanship and would allow for a more team-oriented approach to sport — something particularly valuable in a sport as highly team-based as rowing — and would allow for one to

work effectively with others and prioritize the success of the group as opposed to the individual. Perry also identifies the benefits of openness in sports, as "being open to a new experience is fundamental if a performer is going to learn from others… even the most talented need to keep improving to stay ahead." For conscientiousness, Perry says it "is best characterized by an individual's desire to perform a task well [and] who can take responsibility for their own performance…Coaches often love conscientious performers — they can be relied upon". An individual who is committed, responsible, and thorough is an asset to a team, and the traits of reliability and efficiency are crucial to environments such as sports in which a collective goal must be achieved through the completion of a task, in which a conscientious person would be sure to tackle creatively and effectively.

Once again, these three traits correlate with success in both athletics/academics for collegiate athletes, as shown by collegiate rowers. Through the research process, I developed the skill of synthesis and application, in which I've learned to consider multiple sources together, such as connecting Big Five personality traits to their role in sport and apply it to my everyday experiences, such as my coaching endeavors, where I now approach athletes' mindsets in a more educated way given my developed understanding of the topic. I will continue applying this skill in the future, as I approach my roles as a collegiate rower and researcher in a new way, with the knowledge that I've gained through this process. One significant part of this new approach is the awareness that these traits can be encouraged to nurture success in student-athletes, something that has notable implications on the field of sports psychology as applied to collegiate athletes, both practical and theoretical.

Conclusions & Implications

Practical Implications

While big five traits are largely influenced by genetics and early life experiences (Jang et. al., 1996), research says that individuals can cultivate and encourage traits through deliberate effort and practice (Roberts et. al., 2003). The potential applications of this come through particular methods of training that encourage behaviors related to certain traits. A recent study proposed that intrinsic motivation in training, being motivation that comes without external reward and instead is in pursuit of personal gratification, has a positive effect on traits of openness, and additional support from authority figures (in the case of this research, coaches) to realize the potential personal benefits of investing in training can help to encourage openness (Laible et. al., 2020). The same study suggests that agreeableness is positively influenced by engagement in further informal training opportunities, such as arriving early to practice to develop technical skills outside of formal practice time. The study explains that agreeable individuals tend not to refuse to partake in extra work, especially when coaches suggest them, and will enthusiastically participate given the chance; however, they may be reluctant to ask for informal training opportunities, so coaches taking the initiative to offer such opportunities can help to encourage this trait. Furthermore, conscientiousness is encouraged primarily by ideas of duty, i.e. fulfilling requirements and performing responsibilities. By establishing clear rules, goals, and deadlines, along with clarifying and emphasizing the importance of responsibilities to the team, coaches can help to encourage conscientiousness.

In terms of specific practical implications, these training opportunities can vary based on the trait they intend to promote. In the case of openness, coaches can encourage their athletes to engage in mindfulness practices that help to develop their self-awareness and identity, allowing

them to better employ intrinsic motivation to invest further into training with a more open mindset. For agreeableness, coaches can ensure that they are using positive reinforcement with their team, such as verbally expressing approval when athletes engage in further informal training opportunities. Embracing an approachable persona and engaging with athletes to suggest further training would also help to encourage agreeableness. For conscientiousness, team-building activities, especially involving the establishment of team norms and goal-setting, are an ideal way for coaches to encourage high-performing athletes. Exercises such as visualization of a goal and the steps towards it help athletes to increase their motivation and sense of purpose and willingly engage further in their sport, along with fostering a culture of self and group accountability so that athletes are encouraged to take ownership of their performance, learn from past mistakes, and act as a group to develop skills of planning, preparation, and thoroughness. Coaches can play a major role in the practical applications of the specific Big Five traits that this research has proven to correlate with high-success performance in student-athletes.

Theoretical Implications

These results also have significant theoretical implications for the field of collegiate athletics. Knowing the scientific evidence of openness being associated with increased risk of detrimental substance use due to its characteristics of experimentation, willingness, and spontaneity (Sattler & Schunck, 2016), initiatives for the awareness and avoidance of risk behaviors would help ensure the safety of high-performing open individuals. Additionally, research regarding connections between Big Five traits and mental health among college students has shown that low conscientiousness, characterized by disorganization and lack of direction, can be a risk factor for poor mental health (Lewis & Cardwell, 2020). This implies that if certain

individuals are exhibiting behaviors associated with low conscientiousness and, according to the results of my study, performing poorly in academics/athletics, it would likely be beneficial to instigate a mental health intervention, or "check-in". By helping to improve mental health and discourage low conscientiousness, these interventions can raise an athlete's level of conscientiousness and put them on the path to success. Lastly, the altruistic, trusting nature of agreeable individuals can be beneficial to the coach-athlete relationship, as it allows athletes to take coach feedback positively and actively put suggestions into practice. However, this can also lend itself to athlete reliance on a coach, and a lack of self-motivation when not enough external attention is given (Brinkman, 2013). By encouraging athletes to see themselves as their own coach by offering opportunities for individual informal training with some indirect guidance, coaches can nurture agreeableness to a healthy degree while discouraging excessive dependence of athletes on coaches.

Limitations & Further Directions

Albeit, there are limitations to this research. Firstly is the issue of gender. Women have been proven to have different experiences in athletics, contending with what some call a "female/athlete paradox" (Ross & Shinew, 2008) of expectations of femininity that conflict with the associations of participating in sports. However, this study analyzed exclusively male athletes. Originally, I aimed to include more variety in the demographics of subjects, including both male and female athletes on teams from all divisions. However, this approach introduced confounding variables in the proven differences in average Big Five traits attributed to women versus men (Weisberg et. al., 2011,). By choosing to narrow my focus to male D1 rowers, I was able to thoroughly examine a specific pool of subjects, leading me to a more specific, effective

research process. Moreover, the implications of my results are positive ones that are not exclusive to gender, and my conclusions open the door to future research that could focus exclusively on female athletes to determine if there is a significant difference based on gender.

Finally is the issue of class. Subjects of this study were students at private universities, all of which have annual tuition upwards of $60,000 (Kerr & Wood, 2022). The ability to afford the cost to attend these universities, in addition to the tendency of pre-collegiate rowing to be club as opposed to high school and thus requiring membership fees (Chiesa, 2021), implies that subjects of this study are likely to be of higher socioeconomic status and wouldn't accurately represent the population of all student-athletes. Nonetheless, in terms of psychological analysis, research shows that Big Five traits have little to no relationship to wealth (Lechner et. al., 2021) and the positive implications of the results are applicable to individuals of any socioeconomic status. Rowing isn't the only sport that tends to be associated with wealth; one could say the same about equestrian, sailing, etc, and the choice to examine rowing specifically allows for a narrower scope and offers opportunities in the field for future research, perhaps focusing on other sports to confirm or deny the universality of this study's implications.

Regardless, this inquiry into the psychological traits that correlate with successful academic/athletic performance isn't solely a study of male, wealthy, or D1 subjects. It's a study of collegiate student-athletes, no matter their gender, background, or division. This research has proposed a baseline for the understanding of the topic — in that agreeableness, conscientiousness, and openness correlate with success in both athletics/academics — and provides direction for future research to analyze other potential variables of student-athletes, widening the scope of application, and increasing opportunities for coaches and athletes to better

understand how to maximize success in the classroom and on the field (or in the boat) across diverse demographics.

References

Athletic Scholarships. (2023). *College Rowing Scholarships | Best College Rowing Teams.* Athletic Scholarships. https://www.athleticscholarships.net/rowingscholarships.htm.

Bacon, D. R., & Bean, B. (2006). GPA in Research Studies: An Invaluable but Neglected Opportunity. *Journal of Marketing Education*, 28(1), 35–42. https://doi.org/10.1177/0273475305284638

Brinkman, C.. (2013). *The Big Five Personality Model and Motivation in Sport.* (Doctoral dissertation, Miami University). OhioLINK Electronic Theses and Dissertations Center. http://rave.ohiolink.edu/etdc/view?acc_num=miami1375299442.

Chiesa, C.. (2021). *Why US High School Rowers Get Sick of Rowing*. Junior Rowing News. https://juniorrowingnews.com/why-us-high-school-rowers-get-sick-of-rowing/.

Cornett, J., Bush, P., & Cummings, N. (2008). An 8-factor model for evaluating crew race performance. *International Journal of Sports Science and Engineering, 2(3)*, 169-184. https://www.researchgate.net/publication/238726887_An_8-factor_model_for_evaluating_crew_race_performance.

Fiske, D. W. (1949). Consistency of the factorial structures of personality ratings from different sources. *The Journal of Abnormal and Social Psychology*, 44(3), 329–344. https://doi.org/10.10 37/h0057198.

Gelfand, M. J., Caluori, N., Jackson, J. C., & Taylor, M. K. (2020). The cultural evolutionary

trade-off of ritualistic synchrony. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *375*(1805), https://royalsocietypublishing.org/doi/10.1098/rstb.2019.0432#d1e1363.

Hosea, T. M. & Hannafin, J. A.. (2012). Rowing injuries. *Sports health, 4*(3), 236-245. https://journals.sagepub.com/doi/abs/10.1177/1941738112442484?journalCode=spha.

Jang, K.L., Livesley, W.J. & Vemon, P.A.. (1996). Heritability of the Big Five Personality Dimensions and Their Facets: A Twin Study. *Journal of Personality, 64*(3), 577-592. https://doi.org/10.1111/j.1467-6494.1996.tb.

John, O. P., Donahue, E. M., & Kentle, R. L. (1991). The Big Five Inventory--Versions 4a and 54. *University of California Berkeley, Institute of Personality and Social Research.* https://www.ocf.berkeley.edu/~johnlab/bfi.htm.

John, O. P. & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. *Handbook of personality: Theory and Research, 2*, 102-138. https://pages.uoregon.edu/sanjay/pubs/bigfive.pdf.

Johnson, V. E. (1997). An alternative to traditional GPA for evaluating student performance. *Statistical Science, 12*(4), 251-278.

Kellmann, M. (2010), Preventing overtraining in athletes in high-intensity sports and stress/recovery monitoring. *Scandinavian Journal of Medicine & Science in Sports, 20*(2), 95-102. https://doi.org/10.1111/j.1600-0838.2010.01192.x.

Kerr, E. & Wood, S.. (2022, September 12). *See the Average College Tuition in 2022-2023*. Colleges, U.S. News & World Report. https://www.usnews.com/education/best-colleges/paying-for-college/articles/.

Kleshnev, V. (2020). *Biomechanics of Rowing: A unique insight into the technical and tactical*

aspects of elite rowing. The Crowood Press.

Komarraju, M., Karau, S. J., & Schmeck, R. R. (2009). Role of the Big Five personality traits in predicting college students' academic motivation and achievement. *Learning and individual differences, 19*(1), 47-52. https://doi.org/10.1016/j.lindif.2008.07.001.

Lechner, C. M., Bender, J., Brandt, N. D., & Rammstedt, B. (2021). Two Forms of Social Inequality in Students' Socio-Emotional Skills: Do the Levels of Big Five Personality Traits and Their Associations With Academic Achievement Depend on Parental Socioeconomic Status?. *Frontiers in Psychology, 12*. https://doi.org/10.3389/fpsyg.2021.

Lewis, E. G., & Cardwell, J. M. (2020, June 2). The big five personality traits, perfectionism and their association with mental health among UK students on professional degree programmes. *BMC psychology, 8*, 1-10. https://doi.org/10.1186/s40359-020-00423-3

McDonald, B. (2004). The university rowing club as a site of moral and social education in Japan. *International sports studies, 26*(2), 23.

NCAA. (2019) *2019 GOALS (Growth, Opportunities, Aspirations and Learning of Students in college) Study* (4). [Data set]. NCAA.

O'Connor, M. C., & Paunonen, S. V. (2007). Big Five personality predictors of post-secondary academic performance. *Personality and Individual differences, 43*(5), 971-990.

Perry, J. (2015). Understanding people: psychology of sport – Five-factor model. In *Sport Psychology: A complete introduction* (pp. 5–15). Hodder & Stoughton.

Poropat, A. E. (2009). A meta-analysis of the five-factor model of personality and academic performance. *Psychological bulletin, 135*(2), 322.

Purdy, L., Potrac, P., & Jones, R. (2008). Power, consent and resistance: An autoethnography of competitive rowing. *Sport, education and society, 13*(3), 319-336.

Roberts, B. W., Robins, R. W., Trzesniewski, K. H., & Caspi, A. (2003). *Personality trait development in adulthood* (pp. 579-595). Springer US.

Ross, S. R., & Shinew, K. J. (2008). Perspectives of women college athletes on sport and gender. *Sex roles, 58*, 40-57. https://doi.org/10.1007/s11199-007-9275-4.

Sattler, S., & Schunck, R. (2016, January 5). Associations between the big five personality traits and the non-medical use of prescription drugs for cognitive enhancement. *Frontiers in Psychology, 6*. https://doi.org/10.3389/fpsyg.2015.01971.

Weisberg, Y. J., DeYoung, C. G., & Hirsh, J. B. (2011). Gender differences in personality across the ten aspects of the Big Five. *Frontiers in psychology, 2*. https://doi.org/10.3389/fpsyg.2011.00178.

Wortman, J., Lucas, R. E., & Donnellan, M. B. (2012). Stability and change in the Big Five personality domains: evidence from a longitudinal study of Australians. *Psychology and aging, 27*(4), 867–874. https://doi.org/10.1037/a0029322.