Personal and Group Environment Factors of Water Polo Players

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Dedication

This thesis is dedicated to all the water polo players and coaches that I have had the pleasure of meeting over the years and the ones that have become lifelong friends. I would not be where I am today without them.

Abstract

This study examined to see if Division I female water polo players (n = 113) had a distinct personality profile when compared to their counterpart of other female college students (n = 170). Also, this study analyzed to see the impact personality traits and team cohesion variables had on overall athletic satisfaction in female water polo players. The measures used were as follows: for personality, the Personal Style Inventory for College Students (PSI, Lounsbury & Gibson, 2008); for team cohesion, Group Environment Questionnaire (GEQ, Carron, Widmeyer, & Brawley, 1985) ; and for athletic satisfaction, Athletes Satisfaction Questionnaire (ASQ, Riemer & Chelladurai, 1998). The results looking at the differences between means and effect sizes in regard to the Big Five Personality traits in water polo players and other college students showed a significant difference in 3 out of the 5 traits (conscientiousness, emotional stability, and openness). Then, when looking at overall athletic satisfaction in their athletic experience a hierarchical multiple regression analysis was performed. The Big Five Personality traits only accounted for 7% of the variance (statistically insignificant change in R^2 [coefficient of determination], $p = .16$), while the four team cohesion measures accounted for 55% ($p < .001$) of the variance, a large effect. In particular, a part correlation showed that significant results between athletic satisfaction and *Individual attraction to the group-Task* (ATG-T, r_{part} [part correlation]= .37, $p < .001$) and *Group Integration-Task* (GI-T, r_{part} [part correlation]= .29, $p < .001$). These findings have implications to help players and coaches understand if they would be a good fit for a Division I water polo team and to understand how to best make a team successful. Future research can also be done to see if these results are generalizable to other similar team sports as well (i.e. soccer, hockey, etc.).

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Chapter 1: Introduction

Water polo is not a sport that many people in the United States have heard of unless you live in a few pockets on the East coast where club and college teams have formed or are from California where playing water polo almost seems like a birthright. The popularity of this sport is growing and will hopefully continue to grow. This is especially relevant after the women's national team took home the gold in the 2012 London Olympics and continues to take home wins in national tournaments. Popularity of water polo in countries within Europe and other international countries tend to treat water polo as the United States treats football (American). Despite this though, the research looking into water polo players is lacking. Data can be found on the physical attributes of a water polo athlete, but this is not the only component that makes up a successful athlete.

When it comes to examining the mystery behind what makes a person excel as an athlete there are a number of factors to consider. Obviously there is the basic physiology; an athlete must have the strength, endurance, and skill in order to succeed. The psyche of an athlete though is something that should not be overlooked. These differences can be broken down in a few ways, first with the characteristic differences between athletes and non-athletes, then looking at those who play team sports versus individual sports, and finally where this study goes, in looking at the differences among the various players and positions on a team. Each of these categories plays a vital role in showing what exactly it takes to not only to be a high caliber athlete but then what it takes to have a particular role on a team.

Personality

Before going into that breakdown a discussion needs to be given to the importance behind looking at the psyche of athletes, in particular at the personality traits of athletes. For

instance, when using the big 5 personality traits to look at a three-way interaction between extraversion/introversion, emotional stability, and openness to new experiences a correlation has been found in relation to coping strategies (Allen, Greenlees, & Jones, 2011). Coping strategies can be relevant for all athletes when it comes to dealing with the stress of the practices, games, and other activities within one's life so understanding which personalities are more prone for certain coping styles can be extremely beneficial. Numerous studies have also looked at personality traits in reference to high-level competitors versus low-level competitors finding higher levels of narcissism, greater positive mental health, and other varying personality traits (Geukes, Mesagno, Hanrahan, & Kellmann, 2012; Newcombe & Boyle, 1995; Straub, 1971; Ogilvie, 1968). This particular study will be using the Big 5 Personality traits when looking at water polo athletes due to its generalizability to larger population samples.

The reason why looking at personality is so valuable when looking at athletes is for more than just an athlete's ability to understand coping strategies. Incorporating the idea of person-environment fit should be considered for athletes in the same way that it can be used for vocational choices. Holland's theory (1996) is based off the idea that a person will be more satisfied in their vocational choice if the values within that career path matched that of their own personality. A person is also more likely to succeed and be stable in a career path if their personality fit the "personality" of the environment in which they are in (Holland, 1996). Some people may not understand the connection between a vocational choice and a sport choice. Considering the time and dedication put into a sport to get to the elite status of being a member of a Division I team where a majority of the time an athlete must be selected during a recruiting process and then that team in a sense becomes one's "family", there seems to be an even higher connection of person-environment fit than would be seen with vocational choices. Out of

personal experience, when I decided I wanted to play Division I water polo in high school and then inquired to my parents about getting a part-time job as is common in adolescence their response was, "Water polo is your job." This person-environment fit, or better put as person-team fit is then strengthened further when considering the Attraction-Selection-Attrition (ASA) framework. The ASA framework emphasizes Holland's theory by putting the idea of people being attracted to particular field on a cycle with organizations choosing people with those particular personalities that fit their company (regardless of competency for job, or maybe in this case position on team), and then in turn will increase the attrition and homogeny of people within the organization (those that do not fit will leave)(Schneider, 1987). All of those components will strengthen and contribute to the overall organizational goals. Distinguishing the personality traits of a water polo player can possibly help with enlightening what exactly the person-team fit is most prevalent for water polo players and help players choose what sport is the best place for them.

Team Sports vs. Individual Sports

There is something about having the added component of being a team sport that separates those from individual sports (i.e. track and field, golf, and tennis) from those involved with team sports (i.e. soccer, volleyball, and hockey). There is a camaraderie component of achieving a goal as a unit that just is not as prevalent for those in individual sports. Studies have even shown that there are personality differences between the two. One study comparing volleyball players to squash players, showed that volleyball players tended to show lower levels of anxiety, greater stability, and just an overall higher level of competitiveness than the individuals squash players (Downd & Innes, 1981). Along those same lines, a study out of Korea found that neuroticism levels were lower in male high school student who participated in team

sports versus individual sports, which they conjectured might be due to the fact that team members provide a sense of emotional stability that members of individual sports just do not get (Han et al., 2006). Another important trait difference to note is that those who take part in team sports have been shown to have higher levels of extraversion in comparison to non-athletes and those playing individual sports (Eagleton & Mckelvie, 2007). There is something about being part of a team that either draws people with particular personalities or pulls those personality characteristics out of people, either way the success of a team then moves on to the players' ability to work together.

Team Cohesion

That brings in the camaraderie components seen among teammates within team sports that can help determine the overall success and well being of a team and that is the idea of team cohesion. The general definition of cohesion involves a group's ability to stay united despite the obstacles they face in order to succeed in accomplishing a goal (Carron, Brawley, & Widmeyer, 1998). There have been strong correlations found between the strength of a team's cohesion and their overall success competitively (Carron, Bray, & Eys, 2002). Certain qualities within a player have been associated with higher perceptions of team cohesion, such as athletes returning for the following season was greater (Spink, Wilson, & Odnokon, 2010) and the frequency of athletes being late or missing a practice was lower (Carron, Widmeyer, & Brawley, 1988) when their perceptions of cohesiveness were higher.

Steps in trying to decipher team cohesiveness have even progressed in using computer algorithms and multiple assessments of behavior and personality to attempt a detailed breakdown of each individual's leadership tendencies, role within the team, drives toward achievement, and other supporting characteristics that might be relevant (Copeland & Straub, 1995). These

extensive breakdowns can help show coaches what types of players are best for particular roles within the team. Studies that can show the exact attributes or traits that make a player a better fit for particular positions to help them be the best leader and or player they can be can possibly even help coaches with younger athletes who have yet to choose a solid position for their sport. This can all help contribute to higher perceptions of team cohesion considering that research has shown positive correlations in higher levels of leadership behaviors and team cohesion (Vincer & Loughead, 2010). Also, looking at the research done on the particulars behind team cohesion, if an athlete has been assigned a role and/or position on a team that is inconsistent with their personality and other characteristics then that could potentially impact how that player sees their cohesion with the team.

Another important component when looking at cohesion is the general satisfaction of athletes. The themes of perceptions of team cohesion, team satisfaction, and leadership components seem to all be intertwined. Greater satisfaction with one's team was found when there were a high number of leaders for three general team functions (task, social, and external) (Eys, Loughead, & Hardy, 2007). Eys, Loughead, & Hardy (2007) made sure that they covered leadership within all dimensions of teammate responsibilities, interpersonal relationships/conflicts, and promoting the team within the community.

Purpose

Considering the success of our national team in water polo it is surprising that there has not been more research done looking into the players that make the game possible. Research on the physical abilities and game intelligence have been done, but nothing looking at the actual psychological aspects of the players as individuals or as a whole team (Falk, Lidor, Lander, & Lang, 2004). Understanding a player's personality, team cohesion and team satisfaction can help

coaches decipher what type of players he or she wants on their team (ex: more introverted or extroverted). This also can show what aspects of team cohesion a coach should be mindful of in order to help his or her team become more successful. Lastly, this research can help demonstrate what components impact a water polo player's satisfaction amongst their team. Considering the game components of water polo, this research could also be applied to other sports with a similar position breakdown (i.e. soccer, hockey, lacrosse, etc.). In summary, three main research questions were addressed:

Research Questions:

Research Question 1 (RQ_1): Do NCAA Division I water polo players differ from other female college students with regard to the Big Five personality traits?

Hypothesis (Hy) 1: The NCAA Division I water polo sample (hereafter referred to as "water polo players") will endorse greater magnitudes of agreeableness, conscientiousness, emotional stability, and openness than a comparison general sample of female college students (hereafter referred to as "other college students").

Hy 2: No significant differences will be found between water polo players and other college students on endorsed magnitudes of extraversion.

RQ_2: How are the Big Five personality traits individually and jointly related to NCAA Division I water polo players' satisfaction with their athletic experience (hypotheses based on Alexander, Levy, & Lounsbury, 2013)?

Hy 3: Agreeableness, emotional stability, and extraversion will be positively related to athletic satisfaction among water polo players.

Hy 4: Conscientiousness and openness will not be significantly related to athletic satisfaction among water polo players.

Hy 5: Emotional stability will be the only Big Five trait with a significant part correlation

RQ_3: As water polo is a team sport, how does team cohesion (as operationalized by the four aspects of team cohesiveness measured by the Group Environment Scale: Individual attraction to the group-task, individual attraction to the group-social, group integration-task, and group integration-social) relate to NCAA Division I water polo players' satisfaction with their athletic experience?

Hy 6: All four aspects of team cohesion will positively relate to athletic satisfaction.

Hy 7: Team cohesion will significant explain variance in athletic satisfaction above that explained by the Big Five traits.

Chapter 2: Method

Participants

The "water polo players" sample was comprised of 113 NCAA Division 1 female water polo players. Age breakdown of the participants was: ages 18-19 (n = 34, 30.1%); 20-21 (n = 37; 15%); 22+ (n = 42; 54.9%). The water polo positions were broken down to Utility (57.5%, n = 65), Whole Set (16%, n = 18), Defender (15%, n = 17), and Goalies (11.5%, n = 13). Over half of the players chose their positions within 1-2 years of playing (58%, n = 66). The breakdown of when players started their water polo careers was ages 5-10 (~17%, n = 20), ages 11-13 (43%, n = 49), ages 14-18 (~38%, n = 43), and age18+ (~2%, n = 2). Desire to play after college was spilt down the middle 50/50, with those saying "yes" desiring to play professionally for a few years (34%, n = 39), play as a career (3%, n = 3), play in the Olympics (18%, n = 20), coach a team as a career (16%, n = 18), and coach a team as a hobby (27%, n = 31) with overlap between the categories. Also, a large majority were captains of their team at some point in their careers (85%, n = 97). Furthermore, the participants indicated whether or not they received some form of scholarship with ~68% (n =7 8) responding "yes."

The "other college students" sample was drawn from an archival database of students completing the personality measure described below. All 170 participants selected were female. Age breakdown of participants was: ages 18-19 (n = 148; 87.1%); 20-21 (n = 13; 7.6%); 22+ (n = 9; 5.3%).

Measures

Demographic Questions. The demographic questions were used to find out some more general information about the participants. The questions consisted of asking participants their

age, position they play, years of playing, division of water polo they participated in, and information regarding their past and future roles/goals involving water polo.

PSI. The Personal Style Inventory for College Students (PSI; Lounsbury & Gibson, 2008) was used as a general assessment of personality. This is a self-report measure that has been validated in measuring college student and adult personality using the Big Five traits of Agreeableness, Conscientiousness, Emotional Stability, Extraversion, and Openness. There are 55 items total and participants were asked to rate on a 5-point Likert scale with '1' as "strongly disagree" and '5' as "strongly agree". Below are brief descriptions of the personality traits measured by the PSI, along with the internal consistency estimates (Cronbach's α) for the current sample.

Agreeableness was defined as being pleasant, equable, participative, cooperative, and inclined to interact with other harmoniously (Cronbach's α = .78). *Conscientiousness* was defined as being reliable, trustworthy, orderly, dependable, organized, and rule-following (Cronbach's α = .76). *Emotional stability* was defined as the overall level of adjustment and emotional resilience in the face of stress and pressure. We conceptualized this as the inverse of neuroticism (Cronbach's α = .72). *Extraversion* was defined as having a tendency to be sociable, outgoing, gregarious, warmhearted, expressive, and talkative (Cronbach's α = .69). *Openness* was defined as receptivity to learning, new experiences, novelty, and change (Cronbach's α = .70).

Team Cohesion. The Group Environment Questionnaire (GEQ, Carron, Widmeyer, & Brawley, 1985) was used to assess cohesion. This is a self-report measure that looks into 4 different dimensions of cohesion: Individual Attractions to the Group-Task (4 items), Individual Attractions to the Group-Social (5 items), Group Integration-Task (5 items) and Group Integration- Social (4 items). There are 18 items total and participants are asked to respond

according to 9-point Likert scale with the '1' representing "strong disagree" and '9' being "strongly agree". A higher score will demonstrate a higher perception of cohesiveness for their team. Below are brief descriptions of the four aspects of team cohesion measured by the GEQ, along with the internal consistency estimates for the current sample.

Individual attraction to the group-Task (ATG-T) is a measure of individual team members' feelings about their personal involvement with the group task, productivity, goals, and objectives (Cronbach's $\alpha = 0.64$). *Individual attraction to the group-Social* (ATG-S) is a measure of individual team members' feelings about personal involvement, desire to be accepted, and social interaction in the group (Cronbach's $\alpha = 0.72$). *Group integration-Task* (GI-T) is a measure of the individual team members' feelings about the similarity, closeness, and bonding within the team as a whole around the group's task (Cronbach's $\alpha = 0.77$). *Group integration-Social* (GI-S) measures the individual members' feelings about the similarity, closeness, and bonding within the team, with the focus being the group as a social unit (Cronbach's $\alpha = 0.78$).

Athlete Satisfaction. The Athletes Satisfaction Questionnaire (ASQ, Riemer & Chelladurai, 1998) was used to assess athlete satisfaction. This is a self-report measure with 56 items that are divided up into 15 different dimensions: Individual performance (3 items), Team performance (3 items), Ability utilization (5 items), Strategy (6 items), Personal treatment (5 items), Training and instruction (3 items), Team task contribution (3 items), Team social contribution (3 items), Team ethics (3 items), Team integration (4 items), Personal dedication (4 items), Budget (3 items), Medical personnel (4 items), Academic support services (3 items), and External agents (4 items). The items are rated on a 7-point Likert scale with '1' representing "not at all satisfied" and '7' as "extremely satisfied" (Cronbach's $\alpha = 0.96$)

Procedure

The "other college student" sample was drawn from an archival database previously approved study approved by the university's Institutional Review Board. Participants at that time were asked to give permission for non-identifying data to be maintained in a secure data for possible future research studies. As an archival sample, this aspect of the participation was exempt from further human subjects' review. Students in the original sample were solicited to complete the PSI online. Most participants were students in an introductory psychology course and received extra credit for participation.

After obtaining approval from the university's Institutional Review Board, the water polo participants were recruited through the researcher's prior connections with the sport and community of water polo. Division 1 teams were focused on specifically due to the difference in time commitment and training practices between the different divisions. Due to the wide expanse of the nation, an online survey was created for the study materials in order to allow a higher probability of response. Coaches for teams were contacted asking them to distribute the study materials to their players. Teams were also contacted through other social media outlets and public listservs (i.e. Facebook) that were associated with collegiate water polo teams and associations. The study materials included Informed Consent Statement; a brief questionnaire in order to elicit demographic information and description of individual athletic role; the Personal Style Inventory for Athletes (PSI-A); the Group Environment Questionnaire (GEQ); and the Athlete Satisfaction Questionnaire (ASQ). The study materials took approximately 30 minutes to complete.

Chapter 3: Results

To assess RQ_1, independent sample *t* tests were performed. Table 1 displays the mean values for the Big Five personality traits for water polo players and other college students, and the independent *t* tests for significant difference between means and effect sizes (Cohen, 1977). Levene's tests for equality of variance revealed that the variance for two of the personality traits (extraversion and openness) were significantly different between the two group, thus the *t* test where equal variance is not assumed was used in those analyses. As seen in Table 1, water polo players achieved significantly higher scores than other college students on three of the five Big Five traits (conscientiousness, emotional stability, and openness). No significant group differences were found for agreeableness or extraversion.

Table 1. Comparison Between Water Polo Players and Other College Students for Personality Variables.

Variable	Water Polo Players		Other College Students	
	M	*SD*	*M*	*SD*
Agreeableness	3.63	0.68	3.72	0.61
Conscientiousness	3.89**	0.65	3.51**	0.61
Emotional Stability	3.41**	0.64	3.04**	0.67
Extraversion	3.81	0.57	3.84	0.72
Openness	3.99**	0.47	3.61**	0.61

Water Polo Players, N=113; Other College Students, N=170
*p < .05, **p < .01

To assess $RQ_{2 \text{ and } 3}$, a hierarchical multiple regression analysis was performed. The Big Five traits were entered first as set, followed the four GEQ subscales in a simultaneous fashion.

Table 2 presents the bivariate correlations between the personality traits and measures of team cohesion and athletic satisfaction. Two of the Big Five personality traits (emotional stability and openness) and all four of the team cohesion measures had significant bivariate correlations. As a group, the Big Five accounted for approximately 7% of the variance in athletic satisfaction—a statistically insignificant change in R^2 ($p = .16$). The four measures of team cohesion accounted for an additional 55% ($p < .001$) of the variance explained in athletic satisfaction—a very large effect (Cohen, 1977). Significant part correlations were found between athletic satisfaction and 1) ATG-T ($r_{part} = .37$, $p < .001$) and 2) GI-T ($r_{part} = .29$, $p < .001$).

Table 2. Correlations Between Personality Traits, Team Cohesion, and Athletic Satisfaction for Water Polo Players.

Personality Traits	**Correlation with Athletic Satisfaction**
Agreeableness	0.12
Conscientiousness	0.12
Emotional Stability	-0.19
Extraversion	0.08
Openness	0.19
Team Cohesion	**---**
ATG-S	0.46
ATG-T	0.70**
GI-S	0.43
GI-T	0.67**

N = 113, **p < .001

Chapter 4: Conclusion

According to the results of this study there is a distinct difference, or in a sense, a water polo player profile, in comparison to other female college students. This means that there are certain personality characteristics that distinguish a female Division I water polo player from their fellow female students. The results showed that a female water polo player was higher on conscientiousness, emotional stability, and openness in comparison to other female college students. Demonstrating these differences in personality can help show that there is a certain personality that is attracted to the sport of water polo from earlier on in the playing process. Those that do not have this particular personality profile may have a harder time staying with the sport all the way to a Division I college team because of conflicts with person-environment fit, or as I stated prior, more appropriately person-team fit (Holland, 1996). One important implication this might also have, since water polo is so similar to other team sports like hockey and soccer, is that this may be a personality profile of just water polo players but for other sports as well. Further studies incorporating these other team sports would help distinguish the differences between the various sports and show if this is a personality profile specific to Division I water polo players or to Division I team sports more broadly.

The overall personality profile is something to keep in mind when considering a water polo player because these difference not only show the type of player attracted to the sport, but they also have other implications of what it means to be a water polo player. The general daily schedule of a student-athlete of a Division I water polo program involves over 20+ hours of training a week (includes strength training, conditioning, and water polo fundamentals in and out of the pool). Add the training schedule on top of taking a full load of classes (at least 15 credits per semester) and any other additional activities an athlete may be involved in to better their

education (i.e. working in research lab, etc.) and one can see the extra stresses involved within a student-athletes life. This is where being higher on emotional stability would make sense for not even the game component of being a water polo player but just for the simple reason of being able to handle the stress of being a water polo student-athlete. The other 2 personality traits of conscientiousness and openness are understandably higher than that of other female college students because of the added component a water polo player has in being part of a team. These personality traits contribute to the team dynamic in that a water polo player must trust their teammates and coaches to be a unit within a game (i.e. an individual cannot win a game, it must be done as a unit) and be receptive to learning with new plays and training exercises when necessary.

Next, when examining the impact of the Big Five personality traits and team cohesion to team satisfaction there were some interesting results. Emotional stability and openness were the only Big Five traits to show to be related to team satisfaction but these traits only accounted for a small portion of the differences found within team satisfaction. Overriding the personal factors were the team cohesion factors that showed to a much larger impact on athlete satisfaction. In particular there were 2 aspects of team cohesion that had the greatest overall impression on the athlete satisfaction scores, Individual attraction to the group task and Group integration of the group task. The first concentrates on how an individual feel's about their personal involvement on the group's task and the latter involves an individual's perceptions about the group's similarity and unification toward the group task and other objectives (Carron, Albert V. et al., 1985). These results help show that team cohesion stands independently from personality traits in determining level of athlete satisfaction. Those on a Division I water polo team have already

established a particular personality profile for their role on a team and now the aspects of team satisfaction and team cohesion are more of a product of team aspects than of individual aspects.

Looking at these results from a consultant's standpoint, interventions for water polo teams should focus around team building activities especially related to task. In general, past studies have showed that if an individual scores higher on these task measures then their overall dedication to the activity (i.e. less absents) is higher (Carron, Albert V. et al., 1985). The strength of individual attraction and group integration towards the group task could have further implication toward the actual success of a team overall as well (Carron, A.V. et al., 2002). As stated before, the intervention methods should have a heavy emphasis on task. In particular, models following mission statements and training styles like that of "The Program, LLC" (2013) could be instrumental in helping foster the group task goal. The Program is an external training program that individuals or teams can bring in to work with them and is actually something I went through multiple times with my water polo team during my time as a Division I water polo player. The focus of a program like this emphasizes building leadership among individuals and especially promotes the idea of team cohesiveness and striving toward a unified goal. When incorporating the results from this study there seems to be a similarity between what a water polo player indicated as contributing to their team cohesion and satisfaction and the approach an outside consultant like The Program takes with their clients. This might be an area for future research studies of looking at different team's cohesion and orientation toward group tasks with those water polo teams (or other team sports) that have gone through training plans like The Program and those who have not.

This study has demonstrated that there is a distinct personality profile of a female Division I water polo player, which is characterized by higher levels of conscientiousness,

emotional stability, and openness. Then, considering the stability of this profile the impact of team cohesion components involving group task have a significant effect on a team's overall levels of satisfaction. This leads to further implications of incorporating skills focusing on the group task for water polo teams that wish to strengthen their team's satisfaction levels and possible success as well. Further research should also look into other team sports to compare the similarities between them.

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Vita

Shelby Morgan Reyes was born in Miami, FL to parents Lisa and Jaime Reyes. She attended Gulliver Preparatory School for high school and was then recruited to play Division I water polo at the University of Maryland, College Park. While at the University of Maryland, she was a member of the Ronald E. McNair Post-Baccalaureate Achievement Program and the Scholars program, Advocates for Children. Shelby completed her Bachelor of Science degree with Honors in Psychology in 2008. During her final year at the University of Maryland she was also captain of her water polo team and received the Weaver-James-Corrigan ACC Postgraduate Scholarship Award to go toward furthering her education. Shelby was then accepted into the Counseling Psychology doctoral program at the University of Tennessee, Knoxville where she is currently a graduate teaching associate. She is completing this thesis in accordance to the requirements to receive a Master's of Arts in Psychology and plans to continue her education at the University of Tennessee until she completes her doctoral degree.