Investigating the relationship between personality traits and athletic performance among elite hockey players

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INVESTIGATING THE RELATIONSHIP BETWEEN PERSONALITY TRAITS AND
ATHLETIC PERFORMANCES AMONG ELITE HOCKEY PLAYERS

A Thesis
Presented To
Eastern Washington University
Cheney, Washington

In Partial Fulfillment of the Requirements
for the Degree
Master of Science in Physical Education

By
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Winter 2016
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MASTER’S THESIS

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ABSTRACT

An interesting trend in the personality literature has been the assessment of the relationship between personality traits and athletic performances. In non-sport settings, the conscientiousness trait has been found to be strongly related to a number of good outcomes including job and training proficiency, academic performances, and physical activity (Barrick & Mout, 1991; Poropat, 2009; Rhodes & Smith, 2006). In the athletic setting, similar findings have been found with soccer players (Piedmont, Hill, & Blanco, 1999), football players (Tran, 2012) and Division 1 collegiate athletes (Saale-Prasad, 2014). However, in professional hockey these findings have generally not been replicated (Karp, 2000; Cameron, Cameron, Dithurbide & Lalonde, 2006; Man & Wohl, 1985). Thus, the purpose of this study was to further investigate the relationship between personality and a variety of indicators of hockey performances. The sample was comprised of 27 male hockey players from a major junior team in the Pacific Northwest. Participant ages ranged from 15 years old to 20 years old (mean age = 18 years old). Personality was assessed using the Big Five Inventory (BFI; John & Srivastava, 1999). The BFI is a validated and reliable instrument that categorizes personality into five dimensions – extraversion, agreeableness, conscientiousness, neuroticism and openness to experience (John & Srivastava, 1999). Findings suggest a subtle link between personality and hockey performance. Directions for future research is discussed.
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Chapter I

Introduction

General Personality

The American Psychological Association (APA) defines personality as the, “...individual differences in characteristic patterns of thinking, feeling and behaving,” (American Psychological Association, 2015). The field of personality is different from many other disciplines. Personality theory is holistic in nature because it studies all aspects of an individual instead of one component (Olson & Hergenhahn, 2011). Thus, personality theories must synthesize human nature by combining different areas of study such as biology, neuroscience and philosophy (Olson et al., 2011). This approach allows personality theorists to encompass virtually all components of human nature and provide explanations of individual behavior. However, personality is not concrete, but rather a dynamic process that has the ability to change. Martens (1975) explains that individual behavior may change depending on the situation (as cited in Weinberg & Gould, 2011). Personality can fluctuate because individuals can respond either characteristically or in response to the demands of the environment.

Personality theorists’ goals are to explain the components of human nature and how humans are similar and different across situations. Olson and colleagues (2011) explain that not one theory is completely successful in describing human nature (p. 2). Therefore, it is important to recognize that most theories emphasize different aspects (Olson et al., 2011). Each theory attempts to explain personality from a different perspective. Thus, each theory leads to separate views of human nature and explanations of behaviors. Theorists observe, study and analyze personality with the hopes of
generating an understanding that can explain all aspects of being human. Furthermore, theorists aim to capture personalities through the implementation and interpretation of psychological assessments. Due to the sheer number of assessments that have been produced (i.e., Minnesota Multiphasic Personality Inventory, Myers Briggs Type Indicator, Personality Assessment Inventory, etc.), there has not been a single assessment used to consistently measure personality. However, in more recent years, researchers have been frequently using the Five Factor Model (FFM) as a universal framework to interpret personality and behavior.

**Five Factor Model.** Personality theorists have created a number of inventories to assess an individual’s personality. Derived from Cattell’s Sixteen Personality Factor Questionnaire (16PF; Cattell, 1957, 1973) the FFM is one of the most common and empirically tested assessments for explaining personality. The FFM provides a framework for describing personality and has been supported through application and practice (John & Srivastava, 1999). This model has been applied to a variety of settings and populations including, cross-cultural research (McCrae & Allik, 2002), clinical settings (Costa & Widiger, 1994), and career development (Lee, Johnston, & Dougherty, 2000). Other inventories have been created based on the FFM, such as the Revised Neuroticism, Extraversion, and Openness to Experience Personality Inventory (NEO-PI-R; Costa & McCrae, 1992), the Big Five Inventory (BFI; John et al., 1999) and Chinese Personality Assessment Inventory (CPAI; Heine, 2012). Given the importance and utility of the FFM, as well as the quality of the measures that have been created for non-clinical populations the FFM would appear to be an appropriate way to address the issues pertaining to personality.
The FFM consists of five dimensions or factors which includes: extraversion, agreeableness, conscientiousness, neuroticism and openness to experience. The combination of these factors provides researchers with an insight to one’s personality and potential behavior. McCrae and Costa (2003) describe the five factors as, “dimensions of individual differences in the tendencies to show consistent patterns of thoughts, feelings and behaviors,” (p. 25).

**Extraversion.** The extraversion factor assesses the amount of social interaction, activity level and the feature of joy in an individual (Trninic, Barancic, & Nazor, 2008). Extraversion is the sociability factor and assesses how “outgoing” an individual may be. Individuals with higher scores prefer frequent interpersonal interactions and are typically energized and optimistic (McCrae & Sutin, 2007). These individuals can be described as warm, sociable, active, fun-loving, dominant and cheerful (McCrae et al., 2007). Individuals with lower scores are more reserved and prefer a few close relationships than compared to a large group of people (McCrae et al., 2007).

**Agreeableness.** The agreeableness factor accounts for the quality of relationships with others (Trninic et al., 2008). Agreeableness explains how an individual acts with and towards others. Individuals with higher scores tend to act unselfishly and regard others with sympathy (McCrae et al., 2007). These individuals can be described as trusting, honest, humble and forgiving (McCrae et al., 2007). Individuals with lower scores are typically not concerned about other people (McCrae et al., 2007). Individuals with low agreeableness scores can be described as hostile, suspicious, manipulative, selfish and stubborn (McCrae et al., 2007).
**Conscientiousness.** The conscientiousness factor describes an individual’s task-orientation and goal-orientation behaviors as well as their level of impulse control (Trninic et al., 2008). Individuals with high conscientiousness scores, “control their behavior in the service of their goals,” (McCrae et al., 2007). These individuals are often described as careful, self-disciplined, ambitious, efficient and organized (McCrae et al., 2007). Low scorers reflect behaviors of disorganization, unreliability and tend to have a hard time keeping a consistent schedule (McCrae et al., 2007). These individuals can also be described as: lax, lazy, weak-willed or untidy (McCrae et al., 2007).

**Neuroticism.** The neuroticism factor identifies individuals whom are emotionally stable or emotionally unstable. This trait recognizes, “persons who tend to feel negative emotions (anxiety, bitterness, sorrow), who suffer from unrealistic ideas, excessive yearning and urges and have or suffer from maladaptive stress-coping strategies,” (Trninic et al., 2008). High scorers experience a variety of emotional distresses (McCrae et al., 2007). These individuals can be described as: anxious, irritable, self-conscious and impulsive (McCrae et al., 2007).

**Openness to Experience.** The openness to experience factor (also referred to as intellect) assesses an individual’s level of adventurous and self-seeking qualities. Individuals with high scores have a tendency to seek out new experiences (McCrae et al., 2007). These individuals are often described as imaginative, artistic, curious and empathic (McCrae et al., 2007). Low scorers are typically traditional, conservative and prefer familiarity (McCrae et al., 2007). Lower openness to experience scores also reflect individuals that are described as “down-to-earth”, old-fashioned or concrete (McCrae et al., 2007).
The FFM provides researchers with a simplistic method to organize personality. The growing popularity of the FFM (Boyle, 2008) and the utility of the instrument has led to the study of personality from general settings to more unique circumstances and situations. Specifically, athletes and the impact of their personalities on their performances has been a question for many researchers. For example, Piedmont, Hill and Blanco (1997) demonstrated the usefulness of the FFM as a predictor of performances as well as a theoretical paradigm to understand athletic behavior (p. 770). This particular branch of personality research has provided researchers with opportunities to observe, study and understand personality as it pertains to the athletic setting.

**Personality and Athletes**

**Ideal Athletic Personality.** Researchers have sought to explore the notion of an “ideal” athletic personality type (Hoffman, 2013). When comparing performances of successful athletes to unsuccessful athletes there appears to be major differences between these two groups. Are there innate, cognitive differences or personalities that underlie the performances of these groups of athletes? Much inquiry has been applied to this thought and research has been mostly inconclusive. Research has been unable to identify a sound theoretical background as well as consistent research that supports a distinguishable athletic personality type.

**Comparisons to Non-Athletes.** Researchers have questioned whether there are distinctive differences in personality types between athletes and non-athlete. Many studies have investigated this claim by comparing athletes from individual sports and team sports (Talyabée, Moghadam, & Salimi, 2013), contact athletes and no contact athletes (McKelvie, Lemieux, Stout, 2003), endurance sport athletes (Egloff & Gruhn,
1996) and athletes that are male and female (Malinauskas, Dumciene, Mamkus, & Venckunas, 2014) with non-athletes. Researchers have noted some differences between athletes and non-athletes, however, more research is necessary to confirm these findings.

**Comparisons to Different Sports.** Many studies have investigated whether athletes of different sports vary in personality. In one study, researchers compared individual sport athletes’ personalities and team sport athletes’ personalities (Ilyasi & Salehian, 2011). Findings demonstrated that individual sport athletes were significantly different than team sport athletes on extraversion, openness to experience and conscientiousness (Ilyasi et al., 2011). Furthermore, individual sport athletes reflected higher scores on all these factors (i.e., extraversion, openness to experience and conscientiousness). Other researchers have studied the differences between individual sport and team sport athletes and have found significant differences but have failed to produce similar results (Behzadi, Mohammadpour, Hedayatikatooli, & Nourollahi, 2012; Peterson, Weber, & Trousdale, 1967).

**Athletic Performances.** Personality has also been examined in the athletic setting as it relates to successful outcomes. For example, Tran (2012) studied the effects of personality with football players and showed that the Big Five dimensions of conscientiousness and neuroticism were significant predictors of achievement. Similarly, Piedmont and colleagues (1997) researched 79 female athletes from four different NCAA Division 1 teams and found analogous results. Regression analyses revealed that neuroticism and conscientiousness explained 23% of the variance in coaches’ ratings of each player (i.e., coachability, work ethic, athletic ability, etc.) and the conscientiousness
trait was the sole predictor of game statistics (i.e., scores, assists, shots, etc.) explaining 8% of the variance (Piedmont et al., 1997).

**Cognitive Skills.** Many studies have investigated the personality differences between successful and unsuccessful performances among athletes. However, the focus of these studies have not been on innate personality traits, but rather employing effective thinking and mental skills strategies (e.g., Hardy, Roberts, Thomas, & Murphy, 2009). Successful athletes appear to have higher levels of self-confidence (Burton & Raedeke, 2008), use positive self-talk (Hatzigeorgiadis, Zourbanos, Galanis, & Theodorakis, 2014), are highly motivated (Vallerand & Losier, 1999) and can control their emotions (Wagstaff, 2014). In the elite setting, researchers identified a number of psychological characteristics of Olympic champions and found that along with basic mental skill tactics (i.e., high confidence, controlling emotions, etc.) other qualities made these athletes successful as well (Gould, Dieffenbach, & Moffett, 2002). These qualities include: a) a hard work ethic, b) coachability, c) goal-oriented behaviors, and d) ability to cope with stress (Gould et al., 2002).

Many performances can be linked to the use of cognitive skills, tools and strategies (i.e., mental skills). However, some researchers have wondered whether personality influences the effectiveness of mental skill strategies and tactics. For example, a low conscientiousness athlete may not be receptive to a goal-setting intervention due to their predisposition to be disorganized, unreliable and/or inconsiderate. In an exploratory study, Woodman, Zourbanos, Hardy, and McQuillan (2010) found that when employing performance strategies it is important to consider an athlete’s personality to maximize the training effectiveness of such mental skill strategies.
More research is necessary to confirm these results, but this may have important implications when coaching or providing sport psychology services to athletes.

**Personality and Coaching.** Many coaches are certain that an athlete’s personality can have an impact on team dynamics and interactions (Favor, 2011). Coaches often evaluate athletes on how receptive they are to new material and the ease of which to teach them new skills or techniques. This can be referred to as coachability. Negative interactions between a coach and athlete may reflect that an athlete is not coachable. Athletes that are not coachable are more difficult to work with and may lead to problems in the coach-athlete relationship. Therefore, many coaches believe it is important, “to select compatible personalities for their teams,” (Favor, 2011). However, the coachability construct, as well as the personality traits related with coachability are not well researched. In one study, Favor (2011) identified associations between emotional stability (e.g., neuroticism domain) and agreeableness with an athlete’s level of coachability (p. 312). These initial findings provide some insight into the personality-coachability relationship and how targeting athletes that are more agreeable and less neurotic may function better in a team setting.

While it may be beneficial to recruit more coachable athletes, it would be unethical to discriminate athletes based on their personality traits. Psychologists warn coaches that personality testing should not be used solely for recruiting purposes or cutting athletes from teams (Kremer & Scully, 1994; Weinberg et al., 2011). Using personality test results appropriately and correctly can provide more insight into an athlete and their behaviors, thus offering information that can be extremely valuable to coaches including identifying better ways to coach their athletes.
One of the duties of coaches is to help their athletes acquire new skills to be successful in their sport. It is crucial that coaches attain knowledge and build relationships with their athletes. Personality inventories can provide information that coaches can use to help their athletes reach their potential. For example, an athlete that has a high neuroticism score may suffer from performance-related anxiety or stress. The ability to cope with anxiety is an essential aspect of sport participation and success (Hardy, Jones, & Gould, 1996). In this case, it would be important that the coach address this and provide tools to help the athlete cope with their anxiety to produce more desirable performances. Therefore, knowing an athlete’s personality would be an integral part of coaching.

While personality has been predominantly viewed as an innate construct of self, psychologist Carol Dweck proposes that personality can be changed to a certain degree (Dweck, 2008). Thus, coaches that have knowledge of an athlete’s personality may be more equipped to coach them as well as to help change certain personality traits to produce more successful outcomes.

**Personality and Hockey Players**

Athletic personalities have been studied from various sports and perspectives including: baseball (Aamodt, Alexander, & Kimbrough, 1982), basketball (Evans & Quaterman, 1983), football (Garland & Barry, 1990), softball (Favor, 2011), cycling (Gat & McWhirter, 1998), and soccer (Laurin, 2009). However, little research has explored the personalities of hockey players. Thus, the purpose of the present study is to investigate the role of personality with hockey players and furthermore, determine the relationship between personality and successful hockey performances.
Most of the literature regarding the personality of hockey players has examined aggression and anger (Bushman & Wells, 1998; Gee & Leith, 2007; Vallance, Dunn, & Causgrove Dunn, 2006; Widmeyer & Birch, 1979). While some research indicates that more aggressive hockey players outperform non-aggressive players (McCarthy & Kelly, 1978), others would argue that high levels of aggression has many negative consequences including the risk of injury (Widmeyer & McGuire, 1993).

In an exploratory study, researchers attempted to describe the personality traits typical of hockey players in specific positions. Cameron, Cameron, Dithurbide and Lalonde (2006) investigated the personality traits and stereotypes associated with hockey forwards, defensemen and goalies (p. 109). Cameron and colleagues (2006) found that from the 578 male hockey players sampled, forwards were seen as more extraverted, disagreeable, undisciplined and open to experience than defensemen and goalies (p. 116). Goalies were the most conscientious (when compared to forwards and defensemen) and more open to experience than defensemen, whereas defensemen were the most emotionally stable (Cameron, et al., 2006). While the above study contributes to the literature regarding personality of hockey players, more research is needed to confirm position-specific hockey personality types.

Very few studies have considered the relationship between personality traits and hockey performances. In one study, Karp (2000) utilized the 16PF (Cattell, 1957, 1973) on a sample of 126 hockey players drafted between 1987 and 1994 (p. 3315). Furthermore, professional scouts rated and assessed each player to predict their level of hockey achievement (Karp, 2000). Results indicated significant differences in personality traits of successful and unsuccessful players. Specifically, a number of factors were found
to be predictors of hockey success. These factors include: reasoning (i.e., intellect), emotional stability, social assertiveness, abstractness, introversion, open-mindedness, and tension (Karp, 2000). Of the following factors many were associated with even greater amounts of hockey achievement and success. These factors were higher intellect scores, lower abstractness scores, lower introversion scores, lower open-mindedness scores, and lower tension scores (Karp, 2000).

The personality and athletes literature, while not complete, has given researchers the opportunity to discover more about the influences of an individual’s personality in the athletic setting. Additionally, more research is necessary when exploring sport-specific (i.e., hockey, etc.) personalities and the associations between personality and performances, coaching and team interactions. Greater knowledge of the role of personality in athletics is crucial for the development of a sound theory and universal understanding of the personality-performance relationship.

**Problem Statement**

Few studies have identified personality traits specific to hockey players, but have been unable to clearly define the role of personality in performance. These studies have been largely inconclusive and with no theoretical background to support findings. However, many coaches believe that an athlete’s personality impacts their coaching, team interactions and performances (Favor, 2011). Therefore, understanding the role of personality traits for hockey players may aid in addressing some of these perceptions as well as provide information on the role of personality with successful athletic performances.

**Purpose Statement**
The purpose of this study are threefold: 1) to understand the role of personality on successful hockey performances, 2) to determine if certain personality traits are associated with successful hockey performances, and 3) to assess if personality trait combinations are associated with successful hockey performances.

**Operational Definitions**

- **Personality:** is defined as the individual differences in characteristic patterns of thinking, feeling and behaving (American Psychological Association, 2015).

- **Hockey Performances:** are determined from game statistics which include games played, goals, assists, points, plus/minus score for skaters and goals against, saves, wins, and loses for goalies.

- **Big Five Traits:** are extraversion, agreeableness, conscientiousness, neuroticism and openness to experiences as measured by the Big Five Inventory (Benet-Martinez & John, 1998; John, Donahue, & Kentle, 1991; John, Naumann, & Soto, 2008).

- **Extraversion:** accounts for an individual’s social behaviors. High scoring individuals can be described as talkative, assertive, social, and/or bold.

- **Agreeableness:** accounts for the quality of interactions with others. High scoring individuals can be described as trusting, kind, cooperative, and/or empathetic.

- **Conscientiousness:** accounts for an individual’s goal-oriented behaviors. High scoring individuals can be described as achievement-oriented, organized, self-disciplined, ambitious, and/or determined.
• **Neuroticism**: accounts for an individual’s emotional stability. High scoring individuals can be described as insecure, emotional, self-conscious, impulsive, and/or hostile.

• **Openness to Experiences**: accounts for an individual’s ability to cope with new situations and experiences. High scoring individuals can be described as creative, imaginative, artistic, and/or non-conventional.

**Limitations and Delimitations**

• The sample was delimited to players on a Major Junior hockey team in the Pacific Northwest.

• The sample size was constrained due to the unique population being researched. A small sample size likely reduced the external validity due to the limited generalizability to other groups and reduced the power of statistical results.

• Participants completed self-report data through questionnaires. Therefore, the data provided by participants may be subject to recall bias, exaggeration, and even a desire to please the researchers.

• The risk of participant dropout due to injury and the transfer of players to other teams were other limitations. Participants that were injured or no longer participated in the Major Junior League were unable to provide performance data.

**Null & Alternative Hypotheses**

**H₀**: There will be no significant relationship between the conscientiousness trait and hockey performances.

**H₁**: There will be a significant relationship between the conscientiousness trait and hockey performances.
**H0:** There will be no significant relationship between the neuroticism trait and hockey performances.

**H1:** There will be a significant relationship between the neuroticism trait and hockey performances.

**H0:** There will be no significant relationship between the combination of conscientiousness, neuroticism and agreeableness and hockey performances.

**H1:** There will be a significant relationship between the combination of conscientiousness, neuroticism and agreeableness and hockey performances.

**H0:** The Big Five traits will not be significant predictors of hockey performances.

**H1:** The Big Five traits will be significant predictors of hockey performances.

**Significance**

Previous research has shown that certain personality traits are linked to superior performances in a variety of settings (Barrick & Mount, 1991; Poropat, 2009; Rhodes & Smith, 2006). Therefore, it would seem appropriate to shift the focus onto the effects of personality in the athletic realm where successful performances may be the deciding factor of a winning or losing team. Thus, this study may improve the personality literature by providing insight into the role that personality plays in successful performances in hockey and how the use of personality data may apply to the coaching and training of hockey players.
Chapter II

Review of Literature

General Personality Literature

The following section will explore the literature regarding general personality. The purpose of this section is to highlight the research, findings and discoveries from the last couple of decades in the field of personality. However, the goal of this section is to provide a brief overview of the literature while relating these concepts to the sport setting. At the conclusion of this section, the focus of this chapter will narrow to emphasize the personality and sport literature, and furthermore, the research concerning personality and hockey.

**Structure of personality.** One common method of organizing personality is relying on Rainer Martens’ structure. Martens’ (1975) structure organizes personality through a three-tiered structure describing the levels of personality (as cited in Weinberg & Gould, 2011). According to Martens, the components of personality are a psychological core, typical responses, and role-related behaviors (Weinberg et al., 2011). This model explains the interactions between an individual’s core beliefs and attitudes and how they may behave. Depending on the situation, individuals will respond either characteristically or in response to the demands of the environment. The social environment plays a significant role in behaviors (Weinberg et al., 2011). Understanding an individual’s personality may allow insight into their inner self as well as their behaviors.

**Psychological core.** The first level of Marten’s structure is the psychological core. The psychological core is the most basic level of an individual’s personality (Weinberg et
al., 2011). The part of the personality structure has been often described as the “the real you” contains information about an individual’s beliefs, attitudes, interests, and values (Adams et al., 2010). This level is the most stable and internal part of an individual’s personality.

**Typical responses.** The second level of the model are typical responses. Typical responses are the usual and predictable ways that an individual responds to certain situations (Adams et al., 2010). Most individuals will respond to similar circumstances the same way. It is important to note that this level of personality can be used as a good indicator of an individual’s psychological core (Adams et al., 2010).

**Role-related behaviors.** The last level are role-related behaviors. Role-related behaviors are the behaviors an individual exhibits in social situation (Weinberg et al., 2011). This level accounts for the variability in an individual’s behavior. Weinberg and colleagues (2011) explain, “Your behavior changes as your perceptions of the environment change. Different situations require playing different roles,” (p. 28). This level is the most external and dynamic aspect of personality.

Personality can be viewed as the aggregate of characteristics that ultimately contribute to the uniqueness of individuals. Marten’s model promotes the parts of personality that remain relatively stable over time (i.e., psychological core) and the parts of personality that may change depending on the circumstances (i.e., role-related behaviors). While stability and change may be opposing constructs of personality, Weinberg et al. (2011) argue that these constructs are important and desirable in personality and continue by confirming that, “[the stable construct] of personality
provides the structure we need to function effectively in society, whereas the dynamic, or changing, aspect allows for learning,” (p. 29).

Another reason that Marten’s model is so effective in organizing personality is because it encourages psychologists, practitioners, and coaches to further understand their clients, participants and athletes. This structure allows personality to be viewed through the role-related behaviors witnessed in particular settings (i.e., practice), but the opportunity to uncover their psychological core. Understanding the real person produces insight into their motivations, actions and behaviors (Weinberg et al., 2011). Building and maintaining relationships is a pivotal piece working in any team setting. Gaining this perspective can help coaches utilize the best strategies that have the possibility of helping their athletes.

**Individual differences.** One of the fundamental aspects of personality is recognizing individual differences. Olsen and Hergenhahn (2011) define individual differences as the, “Important ways in which humans differ from one another,” (p. 19). Many theories attempt to explain the differences in human nature, as well as identifying individual differences. Depending on the theory, individual differences can be derived from an array of determinants. These differences can be the result of: genetics, sociocultural determinants, learning, personal choices, traits, unconscious mechanisms and/or cognitive processes (Olson et al., 2011). These individual differences can been seen in the athletic setting as well. While particular groups of people are alike and dislike the same is true for athletes. Athletes may share many characteristics, but they will also differ individually across groups and settings.
Theories of personality. The goal of personality theories are to explain the components of human nature and how humans are similar and different. Olson and colleagues (2011) explain that not one theory is completely successful in describing human nature (p. 2). Therefore, it is important to recognize that most theories emphasize different aspects (Olson et al., 2011). However, the field of personality is different from other disciplines. Personality and its theories study an entire person – instead of a single component (Olson et al., 2011). Therefore, personality theories must synthesize human nature by combining different areas of study. Common areas include knowledge from biology, neuroscience, philosophy and anthropology (Olson et al., 2011).

This combination of disciplines helps to construct a holistic view of human nature. Questions regarding motivation, behavior and the mind-body connection cannot be described by a single theory without relying on other disciplines. This may be especially true for sport-specific behaviors as well. Personality theories must attempt to explain how athletes are motivated, why athletes may behave in a particular way and how their mind relates to their performances, thoughts and feelings.

Approaches to personality. Psychologists have viewed and theorized personality from many different perspectives. Each approach emphasizes different aspects of personality. For the purposes of this paper, three approaches will be briefly discussed that pertain to the sport and exercise literature. These approaches are the psychodynamic, situation, and trait approaches.

Psychodynamic approach. The psychodynamic approach to explaining personality was mainly promoted by psychologists Sigmund Freud and Carl Jung
(Weinberg et al., 2011). This approach emphasizes the role of the conscious and unconscious mind in an individual’s personality makeup.

Freud’s theory of personality is based on his psychosexual stages of development. Freud believed that these childhood experiences determined the personality characteristics of adults. Olson et al. (2011) state that Freud theorized that adult personality was completely formed by the fifth year of life (p. 39). Freud’s stages were the oral stage, anal stage, phallic stage, latency stage and the genital stage (Olson et al., 2011). Freud believed it was critical for children to transition smoothly from each of the stages. Unfortunately, if this transition was not possible Freud believed there would be consequences. These consequences would be displayed later in life. An adult’s personality would largely depend on the fixated stage and would display characteristics corresponding to that specific stage (Olson et al., 2011).

While Freud’s theory emphasized the unconscious stages of childhood, Jung’s theory of personality was more complex. Jung believed there were three major components of personality. These components were the ego, personal unconscious and the collective unconscious (Olson et al., 2011). Each component has a unique role in an individual’s psyche. Understanding how these components interact would ultimately lead to a greater knowledge of a person and their behaviors. Personality was thought to be the combination of attitudes and functions of thought (Olson et al., 2011). Jung believed that an individual could take an inward view or an outward view of the world which lead to attitude orientations and were labeled either introversion or extroversion (Olson et al., 2011). Functions of thought dealt with an individual’s perceptions and experiences of the world (Olson et al., 2011). These thoughts were categorized into four groups: sensing,
thinking, feeling or intuiting. As a result, Jung believed personality was best explained as a combination of attitudes and functions of thought. Eight personality types emerged from thinking extrovert, feeling extrovert, sensing extrovert, intuiting extrovert, thinking introvert, feeling introvert, sensing introvert and intuiting introvert (Olson et al., 2011).

Two major themes emerge from the psychodynamic approach. The first theme is understanding a person as a whole rather than focusing on isolated traits (Weinberg et al., 2011) and the role of unconscious factors of behavior (Olson et al., 2011). The psychodynamic view can provide a holistic understanding of athletes instead of solely focusing on specific traits. Weinberg and colleagues (2011) state that not all behaviors are under conscious control and it may be appropriate to investigate unconscious determinants of behavior (p. 30). One of the major limitations of this approach is the lack of focus on the social environment and its influence on personality (Weinberg et al., 2011).

Some researchers have explored the influence of the psychodynamic approach in the field of sports psychology. Apitzsch (1995) examined the potential influence of defense mechanisms on sport performances of elite level soccer players (p. 111). According to Freud, defense mechanisms are irrational methods of thinking and behaving in order to reduce or remove anxiety (Olson et al., 2011). Individuals are typically unaware of their defense mechanisms and these mechanisms often distort or falsify reality (Olson et al., 2011). Since sport can be a trigger for anxiety or stress it is important that athletes cope effectively to perform. Apitzsch (1995) warns that the use of inappropriate defense mechanisms can lead to a decline in performance and satisfaction (as cited in Weinberg et al., 2011). Therefore, it may be important to consider the
unconscious mechanisms of behavior and incorporate appropriate coping strategies to help athletes perform to their potential.

In another study, researchers discussed the influence of psychodynamic concepts in understanding general athlete behavior (Strean & Strean, 1998). While the psychodynamic approach was a major contributor to the field of psychology and personality, these concepts may not have much relevance in the sports setting. However, Giges (1998) argues that with the proper training sport psychologists can translate psychodynamic concepts into helpful techniques to aid athletes (p. 226). Thus, it may be possible for some practitioners can use the psychodynamic approach to better understand their athletes as a whole and the role of the unconscious mind.

**Situation approach.** The situation approach emphasizes the environmental influences of behavior rather than personal characteristics. A major advocate for this approach came from Albert Bandura and his social learning theory (Weinberg et al., 2011). Social learning theory emphasizes the importance of learning (i.e., modeling) and reinforcement (Bandura, 1971). According to Olson et al. (2011), “…behavior that was reinforced tended to persist and to transfer to situations similar to the one in which the reinforcement had occurred,” (p. 326). According to this theory an individual’s behavior is influenced by its environment and the behaviors of others. An individual may copy, imitate or replicate a behavior or personality one would like to emulate (Honeybourne, 2003). For example, popular athletes are more likely to have their behaviors copied because these characteristics are viewed as “ideal” personalities (Honeybourne, 2003). Some researchers propose that behavior can be influenced through behavioral determinants such modeling, expectancies and reinforcements (Orlick, 1974). A
fundamental aspect of this approach relies on the situation predicting behavior as opposed to other factors (i.e., unconscious mind, traits, etc.). However, situations cannot consistently predict behavior (Weinberg et al., 2011).

Situations can be powerful determinants of behavior, but situations are not the only aspect to consider. One common belief about sport participation is that it builds character and other desirable personality attributes. However, some researchers have found that competition may decrease prosocial behaviors such as helping and sharing (Hoffman, 2013). Other studies have found that participation in sports may lead to an increase in antisocial behaviors, aggression and lower levels of moral reasoning (Hoffman, 2013). Although sport participation, competition and rivalries may lead to less desirable personality characteristics it can also lead to more healthy and socially valued characteristics as well. Hellison (2011) proposes that moral development and other positive behaviors can be enhanced in the sport settings through positive adult leaders (p. 11). Role models and other leaders can help develop prosocial behaviors in athletes by modeling and reinforcing desirable personality traits.

**Trait approach.** The trait approach focuses on the traits or characteristics of personality. These psychologists believed that personality traits remain relatively stable across a variety of settings (Weinberg et al., 2011). The most notable trait theorists were Gordon Allport, Raymond Cattell and Hans Eysenck.

Allport believed to best understand personality one must rely on many different approaches and viewpoints. However, to truly understand personality it must first be defined. For years Allport struggled to produce a definition that encompassed the important aspects of personality. Finally, in 1961 Allport was able to define personality
as a, “...dynamic organization within the individual of those psychophysical systems that determine his characteristic behavior and thought,” (Olson et al., 2011). This definition was important for the field of personality research because of the themes that emerged. Allport’s definition of personality lead to the concepts that personality was: a) constantly changing, b) a combination of the mind and body, c) the source of individual behavior, and d) different depending on the individual (Olson et al., 2011). However, Allport theorized that personality itself was the aggregate of specific traits and these traits were able to change, were derived from an individual’s mind and body, the source of behavior, as well as what made individuals different.

Similar to Allport’s theory, Cattell believed that traits were the building blocks of personality. Cattell’s research relied heavily on the use of factor analysis to uncover categories of personality traits (Olson et al., 2011). Cattell’s trait categories included: surface and source traits, constitutional and environmental-mold traits, ability traits, temperament traits, and dynamic traits (Olson et al., 2011). Cattell theorized there were 16 traits that were the basic units of personality. These traits were comprised of: a) warmth, b) reasoning, c) emotional stability, d) dominance, e) liveliness, f) rule-consciousness, g) social boldness, h) sensitivity, i) vigilance, j) abstractedness, k) privateness, l) apprehension, m) openness to change, n) self-reliance, o) perfectionism, and p) tension (Cattell & Mead, 2008). For Cattell, each trait was bipolar indicating a high range or a low range. For example, individuals with a high reasoning score could be described as alert, imaginative, thoughtful and wise (Olson et al., 2011). Whereas, individuals with low reasoning scores could be labeled as dull, stupid or unimaginative (Olson et al., 2011). Cattell emphasized the importance of learning, early development
and group experiences (Olson et al., 2011). Cattell believed these factors could shape, mold and form an individual’s personality.

Another theorist that relied on factor analysis was Hans Eysenck and his perspective of personality traits. Unlike Cattell’s theory, Eysenck emphasized the trait of temperament which is defined as the, “…emotional, motivational, and non-ability-related cognitive aspects of behavior,” (Olson et al., 2011). Eysenck believed that the most important traits were the traits that were genetically determined (Olson et al., 2011). Eysenck’s theory focused heavily on the genetic dispositions of traits that remained relatively stable throughout an individual’s lifespan and were not the result of learning. While an individual may have a predisposition for a trait, that trait may only be apparent if that individual encounters a specific environmental context that invokes said trait.

It is hypothesized that traits remain relatively stable over time and individuals with certain characteristics may behave accordingly to that trait in situations. Many researchers have investigated how different personality traits impact job performance, academics and physical activity levels (Barrick & Mount, 1991; Poropat, 2009; Rhodes & Smith, 2006). For example, researchers investigated the effects of personality traits on football achievement in a sample of over 619,000 participants (Tran, 2012). Findings indicated that football ranks positively correlated with traits of conscientiousness and agreeableness (Tran, 2012). Additionally, multiple regression analysis revealed that the conscientiousness and neuroticism traits significantly predicted football ranks (Tran, 2012). While these studies show promising outcomes for particular traits, results from these studies do not provide enough information for predictions in all settings. That is, knowing an individual’s personality traits is not a reliable predictor of their behaviors.
Each of Allport’s, Cattell’s and Eysenck’s theories have made major contributions to the field of personality research. Trait theories have led to the development of five dimensional models of personality. According to Gill and Williams (2008) and Vealey (2002) the Five Factor Model is one of the most widely accepted models of personality (as cited in Weinberg et al., 2011).

**Five Factor Model.** As previously stated the FFM contains five primary factors. These factors include extraversion, agreeableness, conscientiousness, neuroticism and openness to experiences. The primary factors of the FFM are the aggregate of six lower order facets (Wilt & Revelle, 2008). These lower order facets will be discussed in later sections. However, there appears to be some discrepancies in the research as to the exact terminology of these lower order facets.

Researchers use these five domains to describe personality, yet there is variability in each domain. Each of these factors are on a continuum with high scores and low scores on opposite ends. An important concept to understand is that the terms high and low are arbitrary (McCrae, Gaines, & Wellington, 2012). Thus, when interpreting scores it is important to recognize that one trait is not healthier or better than another. To determine the value of a trait a person must consider the environment or situation they are in (McCrae et al., 2012).

One of the advantages of the FFM is that virtually almost all terms to describe personality can be understood in these five broad categories (McCrae et al., 2012). Thus, the complexities of personality can be described through simplified explanations using these five categories. Other advantages of the FFM include: consensual validation of the model, the increase in personality development, and the universality and utility of the
model (McCrae et al., 2012). While the FFM, appears to be simple enough to understand some discrepancies may arise when describing these categories. McCrae et al. (2012) offer one solution to convey the nature of these categories through examples (p. 66). Examples range from fictional characters from plays, books and movies. For example, Huck Finn, from *The Adventures of Huckleberry Finn*, would be a high scorer on the openness to experiences domain (McCrae et al., 2012). Whereas, a low scorer in this category would be Miss Pross from *A Tale of Two Cities* (McCrae et al., 2012).

Researchers have demonstrated the utility of the FFM of personality through a number of comprehensive meta-analyses (Allen, Greenlees, & Jones, 2013). These analyses have investigated an array of behaviors that are associated to the traits of extraversion, agreeableness, conscientiousness, neuroticism and openness to experiences. Allen et al. (2013) cite studies using the five-factor model for motivation (Judge & Ilies, 2002), leadership (Bono & Judge, 2004) alcohol involvement (Malouff, Thorsteinsson, Rooke, & Schutte, 2007), smoking (Malouff, Thorsteinsson, & Schutte, 2006), burnout (Alarcon, Eschleman, & Bowling, 2009), and job satisfaction (Judge, Heller, & Mount, 2002) (p. 7). Others include meta-analyses on job and academic performances (Barrick et al., 1991; Poropat, 2009). The FFM is a one of the most widely used models to describe personality and it has been used in a variety of settings.

**Extraversion.** The extraversion domain accounts for interpersonal interactions and social behaviors of an individual. The six lower order facets for extraversion are warmth, gregariousness, assertiveness, activity, excitement seeking, and positive emotion (Wilt et al., 2008). Individuals with higher extraversion scores are often described as bold, assertive and talkative (Wilt et al., 2008). Low scorers can be described as unsocial,
quiet, reserved or serious (Trninic, Barancic, & Nazor, 2008). Extraversion is an important factor of personality for three reasons: a) extraversion is one of the fundamental dimensions of personality, b) extraversion predicts well-being and effective functioning across different settings, and c) extraversion predicts risks and resilience (Wilt et al., 2008). Almost all theories of personality appear to account for the extraversion trait in one form or another.

The extraversion trait has been widely researched in the sport setting. When investigating the relationship between personality and leadership, the extraversion trait has been commonly linked with leadership criteria (Judge, Bono, Ilies, & Gerhardt, 2002). The combination of the extraversion and conscientiousness traits have been found to be strong predictors of leadership emergence and effectiveness (Beauchamp & Eys, 2007). Other research has shown that more extraverted individuals demonstrate greater confidence when speaking in front of others (Pulford & Sohal, 2006). These findings are supported by the descriptors of the extraversion trait. That is, extraverted individuals tend to be more vocal, social and proactive and thus, may provide them with a basic platform for leadership potential and a predisposition for leader qualities. Other studies have compared the differences between interactive sports, coactive sports and non-sport athletes on the extraversion dimension. Eagleton, McKelvie and de Man (2007) found that interactive sport participants had higher scores of extraversion than the other two groups of participants and that these scores did not change over time (p. 265).

*Agreeableness.* Another domain of the FFM is agreeableness. Agreeableness assesses the quality of interpersonal interactions with others. There are six lower order facets of agreeableness, which include empathy, sympathy, warmth, pleasantness,
cooperation and straightforwardness (Judge, Rodell, Klinger, Simon, & Crawford, in press). Individuals that score high on the agreeableness trait can be described as soft-hearted, forgiving, honest and trusting (Trninic et al., 2008). Individuals with low scores are described as mocking, rude, vengeful, or manipulative (Trninic et al., 2008).

The agreeableness trait is typically associated with developing interpersonal relationships (Beauchamp et al., 2007). Graziano and colleagues (1996) found that more agreeable individuals tend to use more accommodating strategies during conflicts than individuals with lower scores, who conversely prefer more coercive approaches (as cited in Beauchamp et al., 2007). Researchers also found that higher agreeableness scores reflected greater empathy towards others (Nettle, 2007). Thus, it would appear that the agreeableness trait would be associated with greater levels of team cohesiveness and positive interactions. Bradley, Baur, Banford and Postlethwaite (2013) found that the agreeableness trait has a positive impact on performance because it has an effect on communication and cohesion (p. 680). However, more research is necessary to confirm these results.

Conscientiousness. The conscientiousness domain describes the goal-oriented behaviors in an individual. The lower order facets include: achievement-orientation, self-discipline, purposefulness, deliberation, tidiness and cautiousness (Judge et al., in press). Individuals with higher conscientiousness scores are often described as self-disciplined, punctual and ambitious, whereas low scorers are described as lazy, unreliable, or inconsiderate (Trninic et al., 2008).

Past research has shown positive associations between the conscientiousness trait and athletic achievement. In two studies that utilized the FFM, researchers found positive
correlations between the conscientiousness trait with football rankings (Tran, 2012) and soccer game statistics (Piedmont, Hill, & Blanco, 1997b). In another study, anxiety, confidence and personalities were tested among two groups of elite and non-elite judo athletes. Researchers found that the conscientiousness trait predicted anxiety and self-confidence (Matsumoto, Takeuchi, Nakajima, & Iida, 2000). Matsumoto and colleagues (2000) suggest that the conscientiousness trait may be related to training adherence and this, therefore, creates more confidence and less anxiety in judo athletes (p. 18). Similar results have been found in other settings with the conscientiousness trait being the most related to positive outcomes (Poropat, 2009; Rhodes et al., 2006).

Neuroticism. Neuroticism accounts for emotional stability within an individual. The neuroticism trait contains the following lower order facets: low tranquility, high impulsivity, high hostility, anxiety, depressive outlook and self-consciousness (Judge et al., in press). Individuals with higher neuroticism scores tend to be described as worrying, nervous, insecure and inadequate (Trninic et al., 2008). Low scorers represent emotional stability and can be described as calm, relaxed and secure (Trninic et al., 2008).

In the sport setting, it is important for athletes to cope with stress effectively to produce desirable performances. Kaiseler, Polman and Nicholls (2012) investigated the relationship between the five personality dimensions and coping and coping effectiveness (p. 62). In their sample of over 480 athletes, researchers found that the neuroticism trait predicted higher stressor intensity, predicted lower perceived stressor control, was associated with more emotion and avoidance coping strategies and less problem-focused coping strategies (Kaiseler et al., 2012). The neuroticism trait appears to be a vital
indicator of athlete stress and coping. It would be appropriate to address athletes with higher neuroticism scores and provide them with more effective coping strategies.

*Openness to Experiences.* The last domain of the FFM is openness to experiences or also referred to as the openness trait. Openness to experiences identifies proactive seeking of new experiences and tolerance for the unknown (Trninic et al., 2008). The lower order traits are quickness, creativity, ingenuity, artistic values, imagination and culture (Judge et al., in press). Individuals with higher scores can be described as imaginative, creative and non-conventional and lower scores are more often described as traditional, down-to-earth, and inartistic (Trninic et al., 2008).

There is a certain degree of risk-taking involved in many different types of sports. For example, in the hockey setting there are inherent risks that are part of the game where one may sacrifice one’s body (i.e., body checking, sliding for the puck, etc.). In one study researchers compared risk-taking behaviors and personality traits to determine if these two variables were related to one another. Researchers found that high scores on the openness to experience trait predicted greater risk-taking whereas high scores on the neuroticism trait were associated with less risk-taking (Lauriola & Levin, 2001). Similar results were obtained by Serdar (2011) where findings indicated that participants of risky sports had significantly higher levels of extraversion and openness to experience and lower levels of conscientiousness and neuroticism (p. 1105).

The FFM is believed to be a sufficient, yet comprehensive, taxonomy to describe personality and its traits (McCrae et al., 2012). With the work of many other researchers, the FFM has become one of the most accepted taxonomies for personality. In the past 30 years, most psychologists have adopted the FFM (McCrae et al., 2012). The history of the
FFM is extensive, but has given researchers the opportunity to expand personality literature as well as increase the understanding of human nature.

**Measuring personality.** The FFM is one of the most prominent models of personality. The creation of the FFM arose from reoccurring problems in personality research (McCrae et al., 2012) – mainly, describing personality traits and providing explanations for individual differences. Researchers struggled with this problem for many decades. During this time, many researchers focused on creating instruments to measure personality. This included instruments such as, the Minnesota Multiphasic Personality Inventory (Hathaway & McKinley, 1943) and the Multidimensional Personality Inventory (Tellegen, 1982). The field of personality research was increasing with the growing number of instruments. While many of these instruments had demonstrated scientific merit, the problem then became that there were too many instruments to choose from (McCrae et al., 2012). Thus, the focus for many researchers was to narrow down the number of instruments and the main method for doing so was factor analysis (McCrae et al., 2012).

In combination with factor analysis, researchers began to use a different approach to synthesize traits. Allport and Odbert (1936) used an approach known as the lexical hypothesis (as cited in McCrae et al., 2012). Researchers extracted all descriptive traits from dictionaries that described personality. The rationale behind this hypothesis was that, “…personality traits are important in human life, [thus] people will have invented words to describe all of them,” (McCrae et al., 2012).

Depending on the instrument, a numerical value or alphabetical code is given to explain that personality type. These codes or values then provide a set of behaviors that
are typical of individuals with similar personalities. For example, extraverted individuals tend to be outgoing and social whereas, introverts tend to be more reserved and quiet. Describing personality through these assessments provides a quantifiable measure for intangible traits as well as, an overview of general behaviors and actions. This chapter will provide a brief overview of the two most common assessments that measure the FFM of personality. The Revised Neuroticism, Extraversion, Openness to Experience Personality Inventory (NEO-PI-R) and the Big Five Inventory (BFI) will be discussed.

**NEO-PI-R.** Costa and McCrae (1985) originally created the Neuroticism, Extraversion, Openness to Experience Personality Inventory (NEO-PI). The NEO-PI initially was a three-factor inventory with neuroticism, extraversion and openness to experience scales. The inventory was later revised to include the other two domains: conscientiousness and agreeableness. These revisions lead to the creation of the Revised Neuroticism, Extraversion, Openness to Experience Personality Inventory (NEO-PI-R; Costa & McCrae, 1992).

The NEO-PI-R contains 240 items which measures all five of the dimensions as well as the lower order facets explained earlier in this chapter. The neuroticism facets are: anxiety, angry/hostility, depression, self-consciousness, impulsiveness, and vulnerability (Costa & McCrae, 2000). The extraversion facets include: warmth, gregariousness, assertiveness, activity, excitement-seeking, and positive emotions (Costa et al., 2000). The openness facets are comprised of: fantasy, aesthetics, feelings, actions, ideas, and values (Costa et al., 2000). The agreeableness facets are: trust, straightforwardness, altruism, compliance, modesty, and tender-mindedness and the conscientiousness facets contain: competence, order, dutifulness, achievement striving, self-discipline and
deliberation (Costa et al., 2000). The NEO-PI-R totals to 30 lower order facets for all five of the dimensions.

Researchers have determined factorial validity of the instrument through multiple samples of factor analyses (Piedmont, 1997). Numerous studies have shown the NEO-PI-R to be a valid and reliable tool (Piedmont, 1997). This instrument has emerged as a vital component of personality research and development. The NEO-PI-R is designed for easy comprehension with clear instructions so the instrument can be administered to virtually any population. The NEO-PI-R is one of the most commonly used instrument to measure the FFM and has a sound base of empirical research.

**The Big Five Inventory.** The present study utilizes the Big Five Inventory (BFI; Benet-Martinez & John, 1998; John, Donahue, & Kentle, 1991; John, Naumann, & Soto, 2008) which is another instrument that measures the five domains of personality. Unlike the NEO-PI-R, the BFI only measures the five domains and none of the lower order facets. The purpose of excluding the lower facets was to create an instrument that was brief, efficient and flexible (John & Srivastava, 1999). The BFI is a self-report inventory that contains 44 items and is constructed in a simple format with short phrases to allow easy comprehension.

The BFI taxonomy has provided researchers with a personality framework and numerous benefits. One of the benefits of the BFI taxonomy is that it allowed the study of personality to be conducted under specific domains rather than examining hundreds of particular attributes (John et al., 2008). Another benefit of the BFI taxonomy provides standard nomenclature that can be easily understood and interpreted by researchers (John et al., 2008). The third benefit are the descriptions of personality which can be
understood in a common framework (John et al., 2008). More information about the BFI will be provided in chapter three.

**Areas for improvement in general personality literature/research.** One of the major inquires of personality research regards the stability and change of personality. Over the years many psychologists have investigated this aspect of personality (Helson, 1999; Kelly, 1955). While some researchers believe that personality does remain relatively stable across adulthood others argue personality changes (Santrock, 2014; Specht, Egloff, & Schmukle, 2011; Srivastava, John, Gosling, & Potter, 2003). Researchers have utilized longitudinal research designs to determine the stability of personality. Some studies have shown changes in personality across the lifespan (Donnellan & Lucas, 2008; Jones & Meredith, 1996; Specht et al., 2011). Research is inconclusive as to how and why personality changes, but psychologists hypothesize that personality changes can occur due to age differences, genetic factors, illness, experiences and major life events (Santrock, 2014; Terracciano, McCrae, Brant & Costa, 2005).

Other areas of improvement include: a) using personality testing as a selection tool and the ethical issues and limitations that must be considered (Morgeson, Campion, Dipboye, Hollenbeck, Murphy & Schmitt, 2007), b) considering the issues with methodological designs and research procedures (Carlson, 1971), c) researching the FFM in other contexts, such as health (Smith & Williams, 1992), and d) considering the limitations of the FFM when reporting generalizability.

**General personality conclusion.** Personality has been studied for decades and has inspired many researchers to investigate the role of personality and how personality influences an individual’s thoughts, feelings and behaviors. There are many different
approaches, viewpoints and ways to measure personality (i.e., psychodynamic approach, situation approach, trait approach, etc.) that differ in various fundamental aspects of personality research. Researchers have different theories on the sources of behavior to how personality is developed across lifespan. Yet, all of these approaches have made vital contributions to the field and the general understanding of personality. While some may argue as to which approach is the best for studying personality in the sport setting, it would be vital for researchers to consider the purpose for studying personality. Hence, researchers should always keep in mind that the purpose of studying of personality is to better understand human nature and to gain a holistic perspective about how people think, act and feel (Vealey, 2002).

**Personality and Sport Literature**

**Ideal athletic personality.** The personality traits of athletes has been widely studied by researchers. Many of these studies research personality in terms of identifying an ideal athlete or ideal athletic personality profile (Saale-Prasad, 2014). While some of these personality traits have been linked to successful performances, results have been largely inconclusive (Piedmont et al., 1997; Saale-Prasad, 2014; Tran, 2012). Researchers have not been able to identify a unique personality profile among athletes (Hoffman, 2013). However, some studies have consistently demonstrated personality differences between athletes and non-athletes, such as higher levels of extraversion, emotional stability and openness to new experiences (Allen et al., 2013).

**Athletes and non-athletes.** Many researchers have investigated the personality differences of athletes compared to non-athletes. In one landmark study, Schurr, Ashley, and Joy (1977) compared personality profiles of roughly 1,600 male college athlete and
non-athletes (p. 53). Results revealed interesting personality trends, but researchers were unable to confirm distinct personality differences between athletes and non-athletes (Schurr et al., 1977). However, when athletes were categorized into sport groups several differences emerged when compared to non-athletes. Team sport athletes and individual sport athletes revealed several differences. For example, team sport athletes displayed higher levels of extraversion and dependency and lower levels of abstract reasoning and ego strength (Schurr et al., 1977). Individual sport athletes exhibited higher levels of objectivity and dependency and lower levels of anxiety and abstract thinking (Schurr et al., 1977). Other studies have found various personality differences between athletes and non-athletes in a variety of sports (Aamodt, Alexander, & Kimbrough, 1982; Booth, 1958; Kajtna, Tusak, Baric, & Burnik, 2004).

**Sport type.** Researchers have also considered the personality profiles of athletes of different sports and different competitive levels. Sport type is typically categorized into one of two groups: individual sports or team sports. Researchers have questioned whether an athletes’ personality type has an impact on sport preference (i.e., team or individual sport) and sport level (i.e., recreational, organized, elite, etc.). Many of these studies have noted various differences in personalities between sport type and level (Booth, 1958; Dobersek & Bartling, 2008; Peterson, Weber, & Trousdale, 1967). However, no research findings have shown consistent personality differences between different athletic groups or competitive levels (Hoffman, 2013). Others would argue that personality test scores can discriminate between different athletic populations (i.e., team vs. individual sports, high risk vs. low risk sports, etc.)(Allen et al., 2013). The
differences documented in these studies are largely found in the extraversion and conscientiousness trait domains (Allen et al., 2013).

**Performance.** One of the most prominent underlying themes of personality research is to identify personality traits that are associated with successful athletic performances. Previous research has linked personality with successful outcomes in the work place (Barrick et al., 1991), academics (Poropat, 2009), and physical activity (Rhodes et al., 2006). Both the conscientiousness and neuroticism traits have been found to be related to desirable outcomes. Personality governs one’s capacity and willingness to perform which are essential components of one’s success in the work or education domains (Poropat, 2009). Allen et al. (2013) also believe that sport success is derived, to some extent, by one’s capacity and willingness to perform as well (p. 8). However, it has been harder to confirm similar associations between personality and sport performance than personality and other performance domains. There may be a number of critical differences that separate sport from other fields such as work and academics (Allen et al., 2013).

Many different research designs have been used to investigate whether personality plays a role in athletic performances. Researchers have compared personalities of different levels of competition (Allen et al., 2011; Egloff & Gruhn, 1996; Gat & McWhirter, 1998), starting athletes and non-starting athletes (Evans & Quarterman, 1983), and athletes that progress to the professional level and athletes that do not progress (Sindik, 2010). Findings have indicated some personality differences between athletes of different levels of competition (Allen et al., 2011; Egloff et al., 1996; Gat et al., 1998) and athletes that advance to play professionally and those that do not (Sindik, 2010), but
starters and non-starters do not appear to show any meaningful differences (Evans & Quarterman, 1983). Other studies have documented the effects of personality in single matches and season-long performances. Allen et al. (2013) suggest that the findings from previous studies show that personality does play a role in long-term performance success and propose personality is unrelated to single match and short-term success (p. 9).

In addition, researchers have investigated how personality is related to behaviors that are associated with successful outcomes. These studies have observed personality differences with different coping strategies (Connor-Smith & Flachsbart, 2007), leadership qualities (Garland & Barry, 1990), positive and negative perfectionism (Egan, Piek, & Dyck, 2015), and athletes’ abilities to meet the demands of their environment (Laurin, 2009). Other studies have investigated how personality moderates training behaviors (Woodman, Zourbanos, Hardy, Beattie, & McQuillan, 2010), and negative emotions (Woodman, et al., 2009). These approaches provide alternative ways to research personality in the sport setting (Allen et al., 2013). The available data demonstrates that personality does appear to play a role in performances within the sport setting. More research is required to have a more comprehensive understanding of personality in sports.

**Cognitive Skills.** Research suggests that there are several differences between successful and unsuccessful athletes. However, these differences are not deeply ingrained personality traits, but rather the use of cognitive skills (Hoffman, 2013). Specifically, successful athletes, when compared to less successful athletes, are: more self-confident, more self-determined, better at coping with stress, better at focusing their attention, better at viewing situations more positively, and better at controlling their emotions (Hoffman,
While these cognitive skills can be taught, learned and applied to virtually any situation, personality may play a role in the adherence of using cognitive skills to improve performances. Some researchers suggest that personality type may influence the use of mental skills such as goal-setting (Woodman et al., 2010).

**Coaching.** The practical application of personality tests can help coaches and practitioners within the sport setting. Understanding an athlete’s personality can help coaches and practitioners identify athletes that may require greater social support (Allen et al., 2013). Personality tests can lead to greater awareness and understanding of coaches and athletes, while also identifying athletes that may need additional support regulating their emotions and/or their attentional focus (Allen et al., 2013). For example, personality testing may help coaches identify more effective ways to coach athletes that are harder to instruct by learning more about them and their personalities (Favor, 2011). Coaches that can learn more about their athletes may be better equipped to coach, lead and instruct their athletes.

Previous research has speculated the moderating effects of personality on performances, however personality may also moderate the coach-athlete relationship as well. Jackson, Dimmock, Gucciardi, and Grove (2011) investigated the five personality dimensions and whether these traits could predict relationship commitment and relatedness between coaches and athletes (p. 222). Researchers reported that the most favorable outcomes between coaches and athletes were cited when their partner was highly conscientious and agreeable (Jackson et al., 2011). Personality may also have a purpose in the formation and maintenance of relationships within sports teams between athletes, coaches and other members.
Criticisms of testing personalities of athletes. When administering personality tests to athletes it is important to understand the inherit limitations of such instruments. Practitioners should avoid unethical and inappropriate use of personality instruments. Weinberg et al. (2011) identify seven principles of measuring athletes’ personalities (p. 37). These principles include: knowing the principles of testing and measurement error, knowing one’s limitations, not using psychological tests for selection purposes, including explanations and feedback, assuring confidentiality, not comparing athletes’ scores with norms, and having a clear understanding of personality and its components (Weinberg et al., 2011). Hanrahan and Anderson (2010) also warn about the difficulties associated with measuring personality directly and when interpreting personality scores (p. 105). It is important for practitioners to understand these basic principles and to be careful when providing personality services to athletes, coaches and teams.

Predictors of behavior. Many researchers have sought to identify the effects of personality on behavior and to determine if behavior can be predicted by particular personality traits. Many studies have shown that personality can predict some behaviors or performances in the sport setting (Allen et al., 2011; Piedmont et al., 1997). However, while these studies contribute to the field of personality and provide a greater understanding of the role of personality in sport these results are not conclusive. Weinberg et al. (2011) strongly urge to not use personality testing to predict sport behavior unless the investigator is: a) certified through a governing organization and b) has been properly trained to interpret results (p. 39). More research is necessary in the sport setting to confirm exploratory results of the role of personality; however, individual differences will always play a role in personality and because of this fundamental aspect.
results may not be generalizable. Paunonen and Ashton (2001) state that the five trait dimensions, “…account for a substantial amount of the variation in human behavior [and] measures of those factors, therefore, can be useful tools for predicting and understanding behavior,” (p. 536). Thus, it is important for researchers to interpret personality results with a degree of skepticism.

**Areas for improvement in personality and sport literature/research.** The re-emergence of personality research in organized sport has led to a number of areas of improvement for the field (Allen et al., 2013). More research is necessary for a number of reasons. Including: improving methodological designs (i.e., addressing small sample sizes, longitudinal studies, etc.), determining the effect sizes of the personality domains in sport, understanding how personality may affect athletic behaviors, and formulating a greater understanding of personality development and sport. In particular, developing a greater understanding of how personality may affect sport participation and whether sport participation can facilitate personality development (Allen et al., 2013). Researchers also encourage the validation and reliability of personality assessments (i.e., NEO-PI-R, BFI, etc.) with adult and youth sport populations (Allen et al., 2013; Smith & Zapolski, 2009).

**Personality and sport conclusion.** Researchers have studied personality and sports with the intentions to understand how personality impacts an athlete’s performance. Researchers have studied the personalities of athletes and non-athletes, athletes competing in different sports and competitive levels. The need for more research is necessary in order to fully understand the role of personality in sports (i.e., the effects of personality domains, the moderating relationship of personality and specific behaviors, etc.). However, the utility of personality testing in practical settings may provide greater
insights into the minds of athletes and coaches. With greater knowledge coaches and practitioners may be more equipped to help, coach and form relationships with their athletes.

**Personality and Hockey Literature**

**Aggression.** Aggression is one of the most studied topics within the hockey setting. Interestingly, aggression can take the form of physical aggression, verbal aggression, anger and hostility (Buss & Perry, 1992). Bettencourt, Talley, Benjamin and Valentine (2006) hypothesize that aggression is related to the traits of agreeableness and neuroticism (p. 751). Kirker, Tenenbaum and Mattson (2000) constructed a framework of sport aggression by comparing ice hockey and basketball participants (p. 373). Researchers found that aggression is a natural component of these sports, aggression varies in frequency and aggression typically occurs in clusters (Kirker et al., 2000). These results are similar to many circumstances that appear in the hockey setting. Therefore, many researchers have explored the role of aggression in hockey players. Some researchers have cited differences in performances between aggressive and non-aggressive players (McCarthy & Kelly, 1978), the frequency of aggression (Widmeyer & McGuire, 1997), how aggression may lead to violence off the ice (Pappas, McKenry, & Skilken Catlett, 2004), and the use of aggression-specific strategies (Widmeyer & Birch, 1984). Aggression does appear to play a role in hockey matches, yet research has yielded mixed results on the importance of aggression in regards to successful performances (McCarthy et al., 1978; Widmeyer et al., 1979).

**Position-specific personalities.** There has only been a handful of studies that have investigated the differences in personality across positions. There is some evidence
that suggests that offensive and defensive athletes display different personality traits. Schurr, Ruble, Nisbet and Wallace (1984) found that offensive positions tend to be more extraverted when compared to athletes in defensive positions (as cited in Allen et al., 2013). In the hockey setting, Cameron, Cameron, Dithurbide, and Lalonde (2012) did not report any noteworthy differences between offensive, defensive and goalies on the five personality domains (p. 109). However, players did rate each position based on their perceived personality traits. Players rated forwards as more extraverted, disagreeable, undisciplined and open to experience than defensemen and goalies (Cameron et al., 2012). Goalies were rated as the most conscientious players whereas, defensemen were rated as the most emotionally stable (Cameron et al., 2012). There appears to be some biases of players of certain positions. Allen et al. (2013) believe that different playing positions may require different behaviors and these behaviors may be derived from particular personality traits (p. 13). However, more research is necessary to confirm these findings and whether there are significant differences between athletes of different positions.

**Performances.** In one longitudinal study, researchers explored the personality characteristics that made professional hockey players in the National Hockey League (NHL) successful. Several traits (i.e., competitiveness, self-confidence, etc.) were documented as significant predictors of goals, assists and points more than a player’s physical attributes (i.e., height, weight, etc.)(Gee, Dougan, Marshall, & Dunn, 2007). In another study, hockey achievement was measured by scouts’ ratings and these ratings were compared to a player’s personality makeup. Multiple factors, as measured by the 16PF, were found to predict hockey achievement (Karp, 2000). Players that were
competitive, able to handle stress, more externally focused, more genuine, more respectful towards authority and less anxious were found to have the greatest success at the professional level (Karp, 2000). Similar results were obtained when physical ability was compared to success. Physical ability ratings did not significantly predict hockey achievement (Karp, 2000). There appears to be a number of behaviors that are associated with hockey achievement at the professional level. However, more research is necessary to verify the personality traits of successful hockey players at the professional, recreational and youth levels. A greater understanding of behaviors related to hockey success may help athletes, coaches and practitioners.

Areas for improvement in personality and hockey literature/research. One of the major areas of improvement for this branch of personality is the need for more research. Many researchers have explored aggression and anger in hockey players including: how aggressive behaviors relate to goals scored (McCarthy et al., 1978) and penalty minutes (Bushman & Wells, 1998), how perfectionist attitudes may influence anger (Vallance, Dunn, & Causgrove Dunn, 2006), and comparing aggression across different populations (Gee & Leith, 2007). However, little research has explored the behaviors outside of aggression and anger. In addition, the need for a consistent measuring tool of hockey players’ personalities is another area of improvement. Researchers have used a variety of personality inventories to measure players’ traits (i.e., 16PF, Eysenck Personality Inventory, Ten-Item Personality Inventory, NEO-PI, etc.). These differences have made it harder for others to confirm results and to create a solid body of literature regarding personality and hockey. However, utilizing a more universal
instrument, like the BFI, may not only aid researchers in hockey personality research, but increase the general understanding of personality and sport as well.

**Personality and hockey conclusion.** Researchers have explored the behaviors and traits specific to hockey players. Most of the hockey literature has researched aggression and anger among these athletes (McCarthy et al., 1978; Widmeyer et al., 1979). However, it may be more useful for researchers to investigate the behaviors and personality traits that are associated with success on the ice. The need for more research is essential to achieve a greater understanding of the role of personality in the hockey setting.

**Summary**

For decades, personality has been studied with the hopes of acquiring more knowledge about human nature. The first task was to understand the structure of personality and how personality can influence one’s thoughts, feelings and behaviors. Many have used a variety of approaches to study personality from the psychoanalytic perspective to the trait theorists. While many still argue about the utility of trait personality, the FFM is one of the most common ways to view, profile and research personality. The five domains – extraversion, conscientiousness, agreeableness, neuroticism and openness to experiences – have been widely studied in many different settings from the workplace, academics and in the clinical setting. In the sport setting, however, researchers have considered the personality traits between athletes and non-athletes, athletes of different sports and the traits associated with the greatest athletic success. One essential criticism appears to be consistently repeated throughout the
personality and sport literature and that is the need for more research. This is especially true in the hockey setting as well.
Chapter III

Methods

Participants

This study explored the influences of personality on hockey performances. The participants for this study were restricted to: a) players on a major junior hockey team in the Pacific Northwest, and b) players included in an existing dataset which was collected in September of 2014. Demographics for the participants consisted of the following:

- The existing dataset included twenty-seven male hockey players.
- Participant ages ranged from 15 years old to 20 years old.
- The team included fifteen forwards, nine defensemen and three goalies.
- The majority of participants were from Canada (86%) with two participants from the United States (7%) and two other participants from other countries (7%).
- Lastly, eighteen participants had finished high school, seven participants were still in high school and two participants had had some college experience.

Measurement Instruments

The measurement instrument utilized for the study were the Big Five Inventory (BFI; Benet-Martinez & John, 1998; John, Donahue, & Kentle, 1991; John, Naumann, & Soto, 2008) and general demographic information. The BFI provided important information for the effectiveness of this study. The BFI is described in detail below.

The Big Five Inventory. The Big Five Inventory (BFI) is a psychometric assessment that measures participants’ personality traits (Benet-Martinez et al., 1998; John, et al., 1991; John, et al., 2008). The BFI is a standardized test that describes personality in five dimensions. These dimensions include extraversion, agreeableness,
conscientiousness, neuroticism and openness to experience. As a recap, extraversion measures levels of joy and social interaction among participants (Trninić, Barančić, & Nazor, 2008). Agreeableness assesses a participant’s orientation towards others whereas, conscientiousness describes goal-oriented behaviors (Trninić et al., 2008). Neuroticism identifies emotional instability and openness to experience measures appreciation for new experiences and the unknown (Trninić et al., 2008). The scoring of these five traits ranges on a scale from high to low. For example, higher scores reflect more of a trait, whereas lower scores reveal less of the trait. Each of these traits creates a unique five dimensional personality profile for participants.

The BFI is a 44-item self-report questionnaire. Each trait dimension has eight to ten items and is scored using a 5-point Likert scale from 1 (“disagree strongly”) to 5 (“agree strongly”). Sample items include: “I am someone who is talkative”, “I am someone who is helpful and unselfish with others”, “I am someone who does a thorough job”, “I am someone who can be tense”, and “I am someone who is original, comes up with new ideas”. All of these sample items represent extraversion, agreeableness, conscientiousness, neuroticism and openness to experience, respectively.

The BFI norms are established using the studied population’s averages. Prior research has identified problems using fixed norms for personality testing. Fixed norms can be misleading and therefore, it is recommended to establish local norms from the sample (Goldberg et al., 2005).

The validity and reliability of the BFI has previously been established (John & Srivastava, 1999) and each dimension has been tested to ensure that the questionnaire items are correctly measuring each trait. While the BFI scales are shorter than other
psychometric inventories, researchers have found that the short and simplistic phrases do not hinder the instrument (John et al., 1999). The BFI has been reported to have alpha reliabilities ranging from .75 to .90 and three-month test-retest reliabilities ranging from .80 to .90 (John et al., 1999). When comparing the BFI with other five-factor inventories (e.g., NEO Five Factory Inventory, Trait Descriptive Adjectives, etc.), researchers found the mean of convergent validity correlation to be .75 (John et al., 1999).

**Demographics.** Participants were asked to answer questions regarding general information about themselves. The following information provides meaningful data as well as characteristics of the population used for this study. This information included: age, hockey position, hometown and country, and participants’ level of education completed.

**Procedure**

This study used participant information from an existing dataset. This dataset was collected prior to the beginning of the study and permission to use and analyze the data was given (see Appendix A).

The BFI was administered to participants at the beginning of their hockey season. The questionnaire contained 52-items (see Appendix B). The questionnaire was administered to all participants, as one group, inside a green room in their training facility located in the Pacific Northwest. The coaches and general manager were present while the lead investigator emphasized the importance to complete the questionnaire to the best of their abilities. At the closing of the introduction, the coaches and general manager left the room and the questionnaire along with a pencil was distributed to each of the participants. The participants were instructed to complete the questionnaire. When
participants completed the questionnaire, the questionnaire was collected, placed in a manila envelope and scored by the researcher.

Data Analysis

The study utilized quantitative data analysis to investigate the relationship between personality and hockey performances. Questionnaire data and game statistics were analyzed. Game statistics were categorized into two groups based on playing position. Participants that were forwards and defensemen were placed in the skaters group. Whereas, participants that were goalies had their own group. Skater game statistics included games played, goals, assists, points, and a plus/minus score. Goalie statistics included games played, goals against, saves, wins, and loses.

The dependent variables for this study were the game statistics from the skaters and goalie groups. Independent variables included data from the questionnaire (i.e., BFI and demographics). Statistical analyses using the Statistical Package for the Social Sciences (SPSS) software were utilized to conduct Pearson product-moment correlations and stepwise multiple regression analyses. Pearson product-moment correlations were conducted to examine the relationship between the dependent variables and the independent variables. Stepwise multiple regression analyses were performed to determine what personality variables from the BFI were predictive of athletic performances. Interpretation of the results from this study may contribute to the understanding of personality in hockey and the influence personality may have on hockey performances.
Chapter IV

Results

This chapter will provide a summary of the results of the statistical analyses used to complete the present study. The sections of this chapter are organized by Cronbach’s alpha results and null hypotheses. Null hypotheses include: 1) there will be no significant relationship between the conscientiousness trait and hockey performances, 2) there will be no significant relationship between the neuroticism trait and hockey performances, 3) there will be no significant relationship between the combination of conscientiousness, neuroticism and agreeableness and hockey performances, and 4) the Big Five traits will not be significant predictors of hockey performances. The results of the following analyses include game statistics for skaters (i.e., forwards and defensemen) only. Due to the small sample size of goalie participants, goalie analyses were excluded.

Cronbach’s Alpha Reliability Coefficients

One of the most common methods of evaluating reliability is through the use of Cronbach’s alpha (Tavakol & Dennick, 2011). The Cronbach’s alpha analysis that provides a measure of internal consistency of a scale or subscale (Tavakol et al., 2011). Most of the personality subscales was found to have good internal consistency. The extraversion subscale consisted of eight items (α = .79), the conscientiousness subscale consisted of nine items (α = .83), the neuroticism subscale consisted of eight items (α = .76) and the openness subscale consisted of 10 items (α = .71). However, the Cronbach’s alpha for the 10 item agreeableness subscale was .49. Low alpha values may be influenced by a number of factors. These factors include a low number of items in a scale, poor inter-relatedness between items or unrelated constructs (Tavakol et al., 2011).
Null Hypothesis One

The conscientiousness personality trait and game statistic variables demonstrated a number of correlations (see Table 1). A significant and positive correlation was found between conscientiousness and the plus/minus score, $r = .565$, $p = .01$. All other game statistic variables (i.e., games played, goals, assists, etc.) revealed low nonsignificant ($p > .05$) correlations with conscientiousness. Penalty in minutes and conscientiousness were positively correlated, $r = .124$. However, the remaining game statistic variables revealed negative correlations with conscientiousness. These variables included games played ($r = -.222$), goals ($r = -.013$), assists ($r = -.048$), and points ($r = -.035$). These negative correlations suggest there is an inverse relationship between the conscientiousness trait and games played, goals, assists and points.

Null Hypothesis Two

All correlations revealed low nonsignificant ($p > .05$) relationships between the neuroticism trait and game statistic variables (see Table 2). Negative correlations were found between neuroticism and games played ($r = -.253$), assists ($r = -.023$), and penalty in minutes ($r = -.242$). The other game statistic variables of goals, points and plus/minus score demonstrated positive correlations with the neuroticism trait, $r = .142$, $r = .053$, and $r = .067$, respectively.

Null Hypothesis Three

The three trait combination of conscientiousness, neuroticism and agreeableness nonsignificantly ($p > .05$) correlated with game statistic variables (see Table 3). All analyses demonstrated low correlations. Negative correlations were found between the three trait combination and goals ($r = -.191$), assists ($r = -.075$), and points ($r = -.135$).
Positive correlations were found between games played ($r = .039$), plus/minus score ($r = .270$), and penalty in minutes ($r = .268$) and the combination of conscientiousness, neuroticism and agreeableness traits.

**Null Hypothesis Four**

Multiple regression analyses were used to test if any of the five personality traits significantly predicted the game statistic variables (see Table 4 and Table 5). The results from the first analysis indicated the extraversion trait significantly predicted games played ($\beta = -.466$). It was found that the extraversion explained 22% of the variance ($R^2 = .217$, $F(1, 20) = 5.535$, $p = .029$). The second analysis revealed the conscientiousness trait as a significant predictor of the plus/minus score ($\beta = .565$). The conscientiousness trait explained 32% of the variance ($R^2 = .319$, $F(1, 20) = 9.369$, $p = .006$).
Chapter V

Discussion

The present study examined the relationship between elite hockey players’ on-ice performances and personality traits. The specific null hypotheses to be examined in this chapter are: 1) there will be no significant relationship between the conscientiousness trait and hockey performances, 2) there will be no significant relationship between the neuroticism trait and hockey performances, 3) there will be no significant relationship between the combination of conscientiousness, neuroticism and agreeableness and hockey performances, and 4) the Big Five traits will not be significant predictors of hockey performances.

Null Hypothesis One

The first null hypothesis proposed there will be no significant relationship between the conscientiousness trait and hockey performances. Analyses revealed a positive and significant relationship ($p < .05$) between the conscientiousness trait and the plus/minus score. Therefore, the null hypothesis is partially rejected and we partially accept the alternative hypothesis that there will be a significant relationship between the conscientiousness trait and hockey performances.

The conscientiousness trait describes individuals that are achievement-oriented, organized, self-disciplined, ambitious and/or determined. These generally positive characteristics may help contribute to a “success” framework that is associated with this trait. The conscientiousness trait has been linked to a number of positive outcomes across a variety of domains. For example, the conscientiousness trait has been associated with longevity (Bogg & Roberts, 2004), health and avoidance of risk (Shanahan, Hill, Roberts,
Eccles, & Friedman, 2014), workplace success (Barrick & Mount, 1991), and academic achievement (Poropat, 2009). In the sports setting, athletes with higher conscientiousness scores were ranked higher in football (Tran, 2012), had better game statistics in soccer (Piedmont, Hill, & Blanco, 1999), exhibited more self-confidence and less anxiety in judo (Matsumoto, Takeuchi, Nakajima, & Iida, 2000), and had better performances on the field and in the classroom (Saale-Prasad, 2014).

A construct related and often anecdotally linked to the conscientiousness trait is the idea of self-control. Individuals that score higher in the conscientiousness domain differ from their lower scoring counterparts because more conscientious individuals tend to, “control their behavior in the service of their goals,” (McCrae & Sutin, 2007). Similarly, self-control is defined as one’s ability to regulate attention, emotion and behavior in the service of one’s goals (Tangney, Baumeister, & Boone, 2004). Studies on self-control have also been associated with a variety of positive outcomes. Including predicting academic performances, higher earnings, better physical health and better social relationships (Galla & Duckworth, 2015). Thus, individuals that have higher conscientiousness scores may have more evolved self-control skills that help them succeed. These individuals regulate their emotions, behaviors and attention in more efficient ways which may help them focus on achieving their goals. Additionally, these individuals may avoid impulses and other temptations that may negatively impact their progress towards their achievement.

Researchers have also identified a number of other factors that differentiate conscientious individuals from others. In one study, researchers sought to identify the daily behaviors of conscientious individuals (Jackson et al., 2011). Jackson and
colleagues (2011) results indicated that conscientious individuals work hard, think before acting and were more organized than individuals who were less conscientious. Other studies found that conscientious individuals are more thorough, persistent, responsible and self-determined than less conscientious individuals (Caligiuri, 2000; Ingledew, Markland, & Sheppard, 2004). Taken in aggregate, this suggests, conscientious individuals are more likely to actively pursue their goals than less conscientious individuals (Packer, Fujita, & Herman, 2013). These characteristics, among others, may help conscientious individuals succeed by influencing their work ethic, mindsets and ultimately, their performances. This study was able to further build upon this line of conscientiousness research by confirming the positive relationship between the conscientiousness trait and hockey performances.

**Null Hypothesis Two**

The second null hypothesis stated there will be no significant relationship between the neuroticism trait and hockey performances. All analyses revealed nonsignificant ($p > .05$) relationships between the game statistic variables and the neuroticism trait. Hence, we fail to reject the second null hypothesis.

The neuroticism trait measures an individual’s emotional stability which includes areas of stress, anxiety and depression. In one study, Morgan (1985) researched a variety of athletes’ psychopathology from elite rowers and wrestlers to collegiate athletes and swimmers (p. 71). Results indicated athletes that were characterized as anxious, depressed, neurotic and withdrawn would be less likely to succeed in their sport compared to athletes with positive mental health indicators (Morgan, 1985). Additionally, negative emotions and anxiety influence an athlete’s success by shifting their attention
and concentration away from their performance and increasing muscle tension (Weinberg & Gould, 2011). Therefore, it was hypothesized that the neuroticism trait would be associated with hockey performances. However, the present study was unable to confirm these findings. This may have been due to the small sample size of the population researched.

**Null Hypothesis Three**

The third null hypothesis proposed there will be no significant relationship between the combination of conscientiousness, neuroticism and agreeableness and hockey performances. All analyses revealed nonsignificant ($p > .05$) relationships between the game statistic variables and the three trait combination. Therefore, we fail to reject the third null hypothesis.

The conscientiousness and neuroticism traits have been commonly documented as being related to performances (Morgan 1985; Tran, 2012). Similarly, the agreeableness trait has been linked to successful performances in team sports due to its impact on communication and team cohesion (Bradley, Baur, Banford, & Postlethwaite, 2013). This research suggests, an athlete with the combination of high conscientiousness, low neuroticism and high agreeableness may have an advantage over other athletes that do not possess this three-trait combination. Unfortunately, this study was unable to support this hypothesis which again, may have been due to the small sample size.

**Null Hypothesis Four**

The final null hypothesis stated that an aggregate model of the Big Five traits will not be significant predictors of hockey performances. Stepwise multiple regression analyses revealed that the extraversion trait alone significantly predicted games played ($\beta$
and the conscientiousness trait alone significantly predicted the plus/minus score ($\beta = .565$). Therefore, the null hypothesis is partially rejected and we partially accept the alternative hypothesis that the Big Five traits will be significant predictors of hockey performances.

The stepwise multiple regression analyses demonstrated that the extraversion trait inversely predicted games played. This finding suggested that players with lower extraversion scores played more games than players with higher scores. The extraversion trait describes individuals that are talkative, assertive, social and/or bold. Our finding is somewhat incongruent with past research which has found links between the extraversion trait and leadership criteria, coping strategies, interpersonal relationships and team performances (Allen et al., 2013).

Allen and colleagues (2013) also found that athletes with higher extraversion scores appeared to outperform athletes that are more introverted when an audience is present, however, the same results were not obtained without an audience. The results from our study propose that athletes with lower extraversion scores play in more games than other athletes. This is somewhat different than stating that introverted athletes play better – although the better players do tend to see more time on the ice. However, many other factors go into how many games a Major Junior player participates in over the course of a season – injuries, age, team needs, among others are all potential mediators. We also cannot discount the possibility that our small sample size is skewing this result. Furthermore, we cannot dig much deeper into the mechanisms driving this result given the cross-sectional design of our study. Given that, we are forced to offer up the finding

= -.466) and the conscientiousness trait alone significantly predicted the plus/minus score
as is – an interesting correlational result which likely needs more robust research to support its external validity.

**Limitations**

While we have interwoven some of the limitations of our research into several of the preceding sections we will highlight them further here. Limitations included the following: a) concerns about sample size, b) the use of self-report data, c) the internal consistency of the agreeableness subscale, d) the use of game statistics as the sole performance indicator, and e) the cross-sectional nature of our design.

Our small sample size is a clear concern as it limits our ability to generalize our findings across populations. In a sample this small it is quite possible that one or two players with outstanding game statistics could have skewed our results in directions which may not be congruent with a larger population of elite hockey players. While this is not desirable, this is also one of the hazards of engaging in field research in ecologically valid settings.

Self-report data may introduce a potential for bias in participants’ responses. The data provided by the participants may be subject to recall bias, exaggeration, and even a desire to please the researchers. Another concern was the weak internal consistency of the agreeableness subscale. Specifically, the Cronbach’s alpha reliability coefficient for this subscale was .49. This subscale falls short of recommendations for reliability coefficients for instruments to meet or exceed .70 (Nunnally, 1978).

The use of game statistics as the sole performance indicator for forwards, defensemen and goalies is also worth noting as a limitation. Game statistics used for the present study most likely did not accurately represent the defensemen because the
statistics were mainly offense-oriented (i.e., goals, assists, points, etc.). Additionally, due to the limited number of goalie participants, all goalies were excluded from analyses.

Lastly, the cross-sectional nature of our design makes cause/effect inferences impossible. While some of our correlational findings are interesting – and likely worth pursuing with future research – they shed very little light on the mechanisms which may be driving our results.

**Future Research Recommendations**

We have several recommendations for future research: first, we believe the field of inquiry surrounding personality and athletic performances should include sports other than hockey. To date there is very limited data showing links between personality and athletic performances across all sports. Further research is required to confirm the non-intuitive nature of these findings. Secondly, there is a need for more diverse approaches to studying the personality of athletes. Specifically, the field of sport psychology would benefit from the use of longitudinal studies – especially to see if personality traits are capable of “maturing” over time. Future research using more robust longitudinal designs may provide more insights and depth to some of the mechanisms which underpin personality and athletic performance. Lastly, future research should also concentrate on personality and coaching interventions. For example, coaches may benefit from knowing an athlete’s personality tendencies as this may allow them to coach, teach and communicate more efficiently with their athletes.

**Conclusion**

The primary purpose of this study was threefold: 1) to understand the role of personality in successful hockey performances, 2) to determine if certain personality
traits are associated with successful hockey performances, and 3) to assess if personality trait combinations are associated with successful hockey performances. Few studies have explored the relationship between hockey performances and personality (i.e., Cameron, Cameron, Dithurbide, & Lalonde, 2006; Karp, 2000; Man & Wohl, 1985). The present study is the first known study to investigate the influence of the combination of three traits and hockey performances among Major Junior hockey players.

The results from the present study partially support the belief that certain personality traits are associated with successful hockey performances. A number of traits were associated with hockey performances. The conscientiousness trait was significantly associated with the plus/minus score. The extraversion trait significantly and inversely predicted games played and explained 22% of the variance. Additionally, the conscientiousness trait significantly predicted the plus/minus score and explained 32% of the variance. While we acknowledge some of the limitations of our study, our findings offer at least partial support for the notion personality may play a role in successful athletic performances.
References


Bivariate Correlations Between the Conscientiousness Trait and Game Statistics

<table>
<thead>
<tr>
<th>Game Statistic Variables</th>
<th>Conscientiousness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Games Played</td>
<td>-.222</td>
</tr>
<tr>
<td>Goals</td>
<td>-.013</td>
</tr>
<tr>
<td>Assists</td>
<td>-.048</td>
</tr>
<tr>
<td>Points</td>
<td>-.035</td>
</tr>
<tr>
<td>Plus/Minus Score</td>
<td>.565**</td>
</tr>
<tr>
<td>Penalty In Minutes</td>
<td>.124</td>
</tr>
</tbody>
</table>

*Note. *p < .05. **p < .01.
Table 2

*Bivariate Correlations Between the Neuroticism Trait and Game Statistics*

<table>
<thead>
<tr>
<th>Game Statistic Variables</th>
<th>Neuroticism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Games Played</td>
<td>-.253</td>
</tr>
<tr>
<td>Goals</td>
<td>.142</td>
</tr>
<tr>
<td>Assists</td>
<td>-.023</td>
</tr>
<tr>
<td>Points</td>
<td>.053</td>
</tr>
<tr>
<td>Plus/Minus Score</td>
<td>.067</td>
</tr>
<tr>
<td>Penalty In Minutes</td>
<td>-.242</td>
</tr>
</tbody>
</table>
Table 3

*Bivariate Correlations Between the Conscientiousness, Neuroticism and Agreeableness Traits and Game Statistics*

<table>
<thead>
<tr>
<th>Game Statistic Variables</th>
<th>Good Big 5 Traits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Games Played</td>
<td>.039</td>
</tr>
<tr>
<td>Goals</td>
<td>-.191</td>
</tr>
<tr>
<td>Assists</td>
<td>-.075</td>
</tr>
<tr>
<td>Points</td>
<td>-.135</td>
</tr>
<tr>
<td>Plus/Minus Score</td>
<td>.270</td>
</tr>
<tr>
<td>Penalty In Minutes</td>
<td>.268</td>
</tr>
</tbody>
</table>
Table 4

Summary of Stepwise Selection in Multiple Regression Analysis of the Big 5 Personality Traits Predicting Games Played

<table>
<thead>
<tr>
<th>Variables Entered</th>
<th>Step Entered</th>
<th>Model R²</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extraversion</td>
<td>1</td>
<td>.217</td>
<td>-.466</td>
<td>-2.353</td>
<td>.029</td>
</tr>
</tbody>
</table>

Table 4
Table 5

*Summary of Stepwise Selection in Multiple Regression Analysis of the Big 5 Personality Traits Predicting the Plus/Minus Score*

<table>
<thead>
<tr>
<th>Variables Entered</th>
<th>Step Entered</th>
<th>Model $R^2$</th>
<th>Beta</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conscientiousness</td>
<td>1</td>
<td>.319</td>
<td>.565</td>
<td>3.061</td>
<td>.006</td>
</tr>
</tbody>
</table>

Table 5
Appendix A: Release Letter

September 14, 2015

To Whom it May Concern,

The Spokane Chiefs hereby grant permission to Brittnay Conway to use the personality data from September 2014 for her thesis.

Please feel free to contact me if you have any questions or concerns.

Yours truly,

Tim Spatz
General Manager
Spokane Chiefs
Appendix B: Inventory

Full Name: ____________________________

Hometown, State, Country: __________________________________________________________

Position: ____________________________ Age: __________________________

1. Which best describes your parents’ status? (Check one)
   - Married
   - Divorced
   - Never Married
   - Separated
   - Deceased (one or both)

2. Parent(s) job or occupation?

3. How many siblings do you have?

4. Where do you fall in order of birth? (Check one)
   - Oldest
   - Middle
   - Youngest
   - Not Applicable

5. Are there more than 5 years between you and the next oldest or youngest sibling? (Check one)
   - Yes
   - No
   - Not Applicable

6. What is the highest level of education you have completed? (Check one)
   - Still in High School
   - Finished High School
   - Some College

7. What was your High School GPA?

8. During hockey season how many hours per week do you train outside of organized practice hours?

<table>
<thead>
<tr>
<th>I am someone who...</th>
<th>Disagree Strongly</th>
<th>Disagree a Little</th>
<th>Neither Agree or Disagree</th>
<th>Agree a Little</th>
<th>Agree Strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Is talkative</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. Tends to find fault with others</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<td>11. Does a thorough job</td>
<td>1</td>
<td>2</td>
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<td>12. Is depressed, blue</td>
<td>1</td>
<td>2</td>
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<tr>
<td>13. Is original, comes up with new ideas</td>
<td>1</td>
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<tr>
<td>14. Is reserved</td>
<td>1</td>
<td>2</td>
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<tr>
<td>15. Is helpful and unselfish with others</td>
<td>1</td>
<td>2</td>
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<tr>
<td>16. Can be somewhat careless</td>
<td>1</td>
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<tr>
<td>17. Is relaxed, handles stress well</td>
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<tr>
<td>Description</td>
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<td>-----------------------------------------------------------------------------</td>
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<tr>
<td>18. Is curious about many different things</td>
<td>1</td>
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<tr>
<td>19. Is full of energy</td>
<td>1</td>
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<tr>
<td>20. Starts quarrels with others</td>
<td>1</td>
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<tr>
<td>21. Is a reliable worker</td>
<td>1</td>
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<tr>
<td>22. Can be tense</td>
<td>1</td>
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<tr>
<td>23. Is ingenious, a deep thinker</td>
<td>1</td>
<td>2</td>
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<tr>
<td>24. Generates a lot of enthusiasm</td>
<td>1</td>
<td>2</td>
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<tr>
<td>25. Has a forgiving nature</td>
<td>1</td>
<td>2</td>
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<tr>
<td>26. Tends to be disorganized</td>
<td>1</td>
<td>2</td>
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<tr>
<td>27. Worries a lot</td>
<td>1</td>
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<tr>
<td>28. Has an active imagination</td>
<td>1</td>
<td>2</td>
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<tr>
<td>29. Tends to be quiet</td>
<td>1</td>
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<tr>
<td>30. Is generally trusting</td>
<td>1</td>
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<tr>
<td>31. Tends to be lazy</td>
<td>1</td>
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<tr>
<td>32. Is emotionally stable, not easily upset</td>
<td>1</td>
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<tr>
<td>33. Is inventive</td>
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<tr>
<td>34. Has an assertive personality</td>
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<tr>
<td>35. Can be cold and aloof</td>
<td>1</td>
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<tr>
<td>36. Perseveres until the task is finished</td>
<td>1</td>
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<td>37. Can be moody</td>
<td>1</td>
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<tr>
<td>38. Values artistic, aesthetic experiences</td>
<td>1</td>
<td>2</td>
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<tr>
<td>39. Is sometimes shy, inhibited</td>
<td>1</td>
<td>2</td>
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<tr>
<td>40. Is considerate/kind to almost everyone</td>
<td>1</td>
<td>2</td>
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<tr>
<td>41. Does things efficiently</td>
<td>1</td>
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<tr>
<td>42. Remains calm in tense situations</td>
<td>1</td>
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<tr>
<td>43. Prefers work that is routine</td>
<td>1</td>
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<td>44. Is outgoing, sociable</td>
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<tr>
<td>45. Is sometimes rude to others</td>
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<tr>
<td>46. Makes plans and follows through with them</td>
<td>1</td>
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<tr>
<td>47. Gets nervous easily</td>
<td>1</td>
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<tr>
<td>48. Likes to reflect, play with ideas</td>
<td>1</td>
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<tr>
<td>49. Has few artistic interests</td>
<td>1</td>
<td>2</td>
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<tr>
<td>50. Likes to cooperate with others</td>
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<td>51. Is easily distracted</td>
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<tr>
<td>52. Is sophisticated in art, music and literature</td>
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</tbody>
</table>
VITA

Author: Brittney H. Conway

Place of Birth: Seattle, Washington

Undergraduate Schools Attended: Bellevue College, 2009-2011, Eastern Washington University, 2011-2013

Degrees Awarded: Bachelor of Science, 2013, Eastern Washington University

Honors and Awards: Graduate Assistantship, Physical Education, Health and Recreation Department, 2013-2015, Eastern Washington University

Graduated Magna Cum Laude, Eastern Washington University, 2013

IM Sports Student-Athlete Award, 2014

Big Sky Conference All-Academic Team, 2011-2012

Emily Squire’s Award, 2012

Sigma Alpha Lambda Honor Society, 2012-2013

Phi Theta Kappa Honor Society, 2011-2012

NWAACC All-Star Team, 2010

NWAACC All-Academic Team, 2010

Bellevue College Student-Athlete Award, 2010

NWAACC All-Region Player, 2009

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Assistant Sport Psychology Consultant, Spokane Chiefs, Spokane, WA 2014-2015

Writers’ Center Responder (Eastern Washington University), Cheney, WA, 2014-2015

University Instructor/Teacher Assistant (Eastern Washington University), Cheney, WA, 2013-2015
Professional Presentation “Predictors of academic success using mental skill variables” at the Northwest Student Sport and Exercise Psychology Symposium (University of Idaho, April, 2014)

Professional Presentation “An Investigation of the Big Five personality traits and elite hockey performance” at the Northwest Student Sport and Exercise Psychology Symposium (Eastern Washington University, April, 2015)