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Analysis of the Primary and Global Factors of the 16PF to Evaluate Individual Traits the General Population can Predict as they Relate to the Scale of Accurate Personality Prediction (SAPP)

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Analysis of the Primary and Global Factors of the 16PF to Evaluate Individual Traits the General Population can Predict as they Relate to the Scale of Accurate Personality Prediction (SAPP)

By

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We the undersigned committee, having examined the submitted doctoral research project, "Analysis of the Primary and Global Factors of the 16PF to Evaluate Individual Traits the General Population can Predict as they Relate to the Scale of Accurate Personality Prediction (SAPP)" by Brittany Allison Haage, M.S. hereby indicates its unanimous approval.

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Abstract

Title: Analysis of the Primary and Global Factors of the 16PF to Evaluate Individual Traits the General Population can Predict as they Relate to the Scale of Accurate Personality Prediction (SAPP)

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Miller (2000) developed the Scale of Accurate Personality Prediction (SAPP), which was derived from a formula comparing obtained and self-predicted scores from the Sixteen Personality Factor Questionnaire (16PF)'s 21 scales. While this measure creates one score speaking to the accuracy in self-prediction of a participant across all the traits, this present study was developed in order to examine each of the 21 traits individually. This includes the 16 primary factors and the 5 global factors. Archival data from 609 participants was analyzed through 5 Pearson correlational analyses. One of the correlational analyses was performed on the total sample of 609 participants. The other four correlational analyses were performed on four random samples of 150 participants each. Results indicated Social Boldness (H) and Extraversion (EX) were the traits with the strongest correlation with the participants' predicted scores. Reasoning (B) was consistently found as not being significantly correlated with its corresponding predicted scores.

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Acknowledgements

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Literature Review

The Self

In the American Psychological Dictionary of Psychology, the term "self "is defined as the totality of the individual, consisting of all characteristic attributes, conscious and unconscious, mental and physical. Apart from its basic reference to personal identity, being, and experience, the term's use in psychology is wide-ranging. According to William James (1890), self can refer either to the person as the target of appraisal (i.e., one introspectively evaluates how one is doing) or to the person as the source of agency (i.e., one attributes the source of regulation of perception, thought, and behavior to one's body or mind). Carl Jung (1979) maintained that the self gradually develops by a process of individuation, which is not complete until late maturity is reached. Alfred Adler (1928) identified the self with the individual's lifestyle, the manner in which he or she seeks fulfillment. Karen D. Horney (1999) held that one's real self, as opposed to one's idealized self-image, consists of one's unique capacities for growth and development. Gordon W. Allport substituted the word proprium for self and conceived of it as the essence of the individual, consisting of a gradually developing body sense, identity, self-estimate, and set of personal values, attitudes, and intentions. Austrian-born U.S. psychoanalyst Heinz Kohut (1977) used the term to denote the sense of a coherent, stable (yet dynamic) experience of one's individuality, continuity in time and space, autonomy, efficacy, motivation, values, and desires. Kohut also believed that this

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sense emerges through healthy narcissistic development, empathically supported by the significant figures in one's early life and that, conversely, narcissistic developmental failure leads to a fragile or incoherent sense of self.

Much like the above definitions, Leary and Tangney (2012) describe the "self" as a construct that includes a vast number of topics within the term. These topics may include: self-esteem, self-control, self-awareness, identity, self-verification, self-conscious emotions, self-affirmation, self-discrepancy, self-monitoring, self-evaluation, and many more. Given these varied terms, the "self" would perhaps be better seen as a larger area of study, rather than just one topic (Leary & Tangney, 2012). William James stated the "self" is created from a person's consciousness (Hart & Matsuba, 2012). The "self" has also been defined as a creation of situations, as well as a molder of behavior in multiple situations (Oyserman, Elmore, & Smith, 2012). The self could also be considered as a sense of something about oneself, indicating a degree of self-reflection, with its corresponding three components of thinking, awareness of thinking, and the self as being an object of thinking (Oyserman, Elmore, & Smith, 2012). Additionally, the term "reflexive capacity" has been used to encompass these three components (Oyserman, Elmore, & Smith, 2012). While many theorists tend to agree with the existences of reflexive capacity, there are differing views about how one's memory factors into the shaping of the self (Oyserman, Elmore, & Smith, 2012). For example, some believe the self is primarily a memory structure, where the "me"

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part of the self is able to exist beyond specific contexts and social structures (Oyserman, Elmore, & Smith, 2012). Opposed to that view is the one which holds that the self is primarily a cognitive structure, where the "me" part of the self is constructed inside of, and encapsulated within, present situations (Oyserman, Elmore, & Smith, 2012).

Sebastian, Burnett, and Blakemore (2008) define self-concept as being one of the main facets of the self. They outline implicit and explicit aspects of the development of the self and self-concept. From birth, people are able to differentiate themselves from others, even in its most primitive form. For example, newborn babies are seeking external stimulation or touch as well as being able to independently recognize their own touch. As the child approaches approximately 18 months of age, his or her awareness of themselves begins to be more explicit. This is when the child is able to recognize his or herself as a unique individual that is separate from others. As the child gets older and begin developing language skills, he or she becomes able to use speech to further differentiate his or herself from other people. The self continues to develop and become more refined throughout the rest of childhood, adolescence, and adulthood (Sebastian, Burnett, & Blakemore, 2008).

Koh, Bee, and Wang (2012) define the self as a construct with many facets. The development of the self is not only gradual and complex, but it is also dependent upon neurocognitive development and sociocultural influences.

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Baumeister (1998) stated the development of the self begins with the human body, requiring consciousness and executive function, and is additionally shaped by environmental factors. The self can then be understood through the interrelationship between all of those factors, as well as by the same factors independently (Koh, Bee, & Wang, 2012).

Leary and Tangney (2012) identified five unique uses of word "self." First, there is the "self as the total person." This use of the word "self" is equivalent to the word "person," where it is specifically being referred to as the person's total being. This use of the word "self" does not include any reference to any particular psychological sense of being. Secondly, the "self as personality" uses the word "self" to encompass all components of an individual's personality, such as temperament, values, abilities, preferences, and goals. This use of the word implicates all the individual's traditional behaviors and traits which help to define one's personality. Thirdly, the "self as the experiencing subject" refers to the self-as subject, the "self-as-knower," or the "self as I." This version of the "self" is the embodiment of a person's psychological experience. This denotes recognition of ongoing thought processes and emotions. Conversely and fourthly, there is the "self as beliefs about oneself," which refers to the "self-as-known" or "self as me." Further, this "self" includes answering questions about oneself. This also includes forming beliefs about oneself, such as "who I am" and "what I am like." Finally and fifthly, the "self as executive agent" pertains to one's decision making and then the

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carrying out of actions by oneself. This "self" can also be known as the "ghost in the machine," which is what determines a person's behavior. This determines the self as an executive operator that aids in processes of self-control and self-regulation.

Leary and Tangney (2012) also define four main psychological features of the self that are inseparably related to one another. These include attentional, cognitive, executive, and emotional-motivational processes. Attentional processes involve people being able to focus their conscious concentration on to themselves. Attentional processes are at the fundamental level of processing, and can occur either deliberately or spontaneously. However, despite being at a rudimentary level of processing, attentional processes also affect one's thoughts, emotions, and behavior. Cognitive processes of the self entail the ability for people to willingly think about themselves. These thoughts include one's current state and situation, one's longstanding characteristics and roles, and memories and imagination of oneself in the past and future. In order for a person to engage in these cognitive processes, he or she requires the development of an identity, a self-concept, and principles for guiding behavior and prompting emotions. Additionally, cognitive processes impart a connection between an individual and the social world. Executive processes refer to the ability to direct oneself and think about oneself in the present and future tense. Through this process, individuals have the ability to self-regulate and can therefore not only decide how they think, feel, and behave, but

also how they plan to carry out those processes. This does not necessarily mean that a person will always exhibit self-control, but it does mean that there is the capability to respond to stimuli independently of one's internal state, history, and environment. However, until knowing how biology creates a person's conscious is fully understood, it will be unknown how a person is truly able to think about one's thoughts and conduct actions of one's body. Lastly, motivational processes involve rationales for self-enhancement and self-verification, and emotional processes involve pride, shame, and embarrassment, to name just a few. The link between motivation, emotion, and the self, however, is complicated. Therefore, there are not enough data to determine conclusions about whether or not the self has its own motivational and emotional characteristics. One of the difficulties is that motivational and emotional processes do not occur in the self through the same mechanisms as the attentional, cognitive, and executive processes. For example, although most animals are considered to not have a "self", it could be argued that they still experience emotions and have motives for behavior. Since these animals are not considered to have a "self," they operate independently of attentional, cognitive, and executive processes. Human beings also exhibit involuntary and unconscious drives and emotional responses of which do not depend upon processes of self-reflection. Nonetheless, it is important to note that the existence of a "self" enhances the collection of motivational and emotional events, indicating unique qualities of human beings (Leary & Tangney, 2012).

The "self as me" is the focal point of the thinking about oneself (Oyserman, Elmore, & Smith, 2012). It is essentially the person being the subject of his or her own thinking. In contrast, the "self as I" is the process of thinking itself, and is the cognitive aptitude of thinking. Together, the "self as I" and "self as me" come together to form what is known as the "self" (Oyserman, Elmore, & Smith, 2012).

There are two main components of the "self as me". The first component is one which includes personal memories and representations and generalizations about oneself (Hart & Matsuba, 2012). Personal memories are memories tied to time and place of which one believes to be defining moments for oneself (Hart & Matsuba, 2012). The formation of representations and generalizations of oneself includes appearance, abilities, relationships with others, as well as other psychological attributes (Hart & Matsuba, 2012). These representations of the self are weighted by degree of importance, and how it relates to other characteristics of the self (Hart & Matsuba, 2012). The second component of "self as me" includes the construct of self-knowledge (Fernández, 2003), and it is this component which is the main subject of the research effort.

Self-Knowledge

As mentioned, s, elf-knowledge is one of the main components of the "self as me." Self-knowledge includes the knowledge of one's values, interests, and personality traits. A person with self-knowledge is able to make decisions in the self's interest, while also being able to avoid obstacles that would prevent him or

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herself from achieving this comprehension about oneself. Modern conceptualizations about self-knowledge indicate that it is a critical element to have and develop, and for one to have to help develop ethical and meaningful ways of living. A person with self-knowledge is better able to make proper decisions about careers, relationships, and other aspects of life due to being aware of one's individual abilities, characteristics, and aspirations. Hart and Matsuba (2012) outline three crucial components that make self-knowledge possible. First, the representation of self-knowledge must first be accurate, meaning the beliefs about oneself must be true. Next, the self-knowledge must be substantiated by methods able to capture the truth. Finally, this knowledge is contingent upon a belief in the information. Therefore, the person must be committed to and invested in both an accurate and legitimate body of information (Hart & Matsuba, 2012).

However, self-knowledge is not easily obtained, and as previously mentioned, the "self" refers to a vast collection of memories, experiences, propositions, and theories. Additionally, not every factor of the "self" grants the capacity for self-knowledge. Depending on time and situation, a person may hold different accounts about oneself, making it challenging to discern which account of the information to be the truth, and which accounts are not. Further, a degree of ambiguity exists when a person identifies with specific factors of the "self", due to the subjectivity and uniqueness of the individual (Hart & Matsuba, 2012).

More contemporary psychoanalytic theories argue that individual needs and strong emotions govern psychological functioning, and provide the framework for the development of self-knowledge. Also, social attunement is another process of developing self-knowledge. This process involves deducing what others believe about the "self." This relates to George Mead's (1934) research on social interactionism by declaring communication promotes reflection of the self. People gain different perspectives about themselves depending on the person self-perceptions, and how each person may be viewing them. At first, this may lead to a lack of harmony in the self, given the different roles. However, as a person gains more social experience, he or she becomes able to cultivate the capacity for integrating similarities among the perceived variances of perspectives. This development helps set the stage for a stable, consistent sense of self and self-knowledge (Hart & Matsuba, 2012).

Self-knowledge is thought to begin to develop in infancy through the imitation of others in order to be able to meet one's own needs. Imitation produces structural similarities between representations of the self and others. It also exposes the individual to the importance of free will. Baldwin (1906) suggests that there are several major stages of self-knowledge. First, the projective stage involves one focusing on characteristics and actions of others, contributing to the emulation of such behaviors. This helps the person distinguish oneself from others, with the addition of personal volition. Additionally, the understanding of volition comes

with the understanding that one cannot control others. This recognition is the catalyst for the subjective stage of self-knowledge, as one understands he or she can act and experience similar events as others do, which then affects their own volition. Therefore, the person is able to recognize how others may be affected by his or her actions. This ties into the person having the capacity to empathize with other people. Finally, social attunement is knowledge the self gains from inferences made about what others believe about them. This concept was derived from George H. Mead's (1934) work with symbolic interactionalism, where he believed social interactions help develop self-reflection and knowledge. The three main points of interest in developing self-knowledge can then be summarized as agency, differentiation of self from others dependent upon social experience in the world, and the social context (Hart & Matsuba, 2012).

Although people tend to be confident and accurate in what they know about themselves, there is research to suggest that people do not really know themselves as well as they think. There are multiple types of illusions people have when it comes to self-knowledge. First, there are enhancement illusions which are beliefs about oneself and one's attributes that are positive. Further, people are more readily likely to report these types of traits than negative traits. Correlations between people's self-assessment and objective assessments tend to be weak. Next, there are unrealistic optimism and control illusions. These illusions refer to when individuals are impractically optimistic when it comes to their personal results. While this type

of illusion may appear to have some benefits, it can also be harmful in that it limits the individual's propensity to carefully consider future beliefs and behaviors. This unfounded degree of optimism leads an individual to believe they are more likely to be successful in an event and thus, the illusion of control is born. Individuals are likely to overestimate their direct effects on desired outcomes. Therefore, it gives the individuals a sense that they have more control over events than they do in reality. Additionally, this is contributed to by the idea that people tend to engage in magical thinking. That is, people tend to think their thoughts have a particular influence on external events of which are indirectly related. For example, wishing for something to happen, does not mean an individual caused it to come to fruition if it does in fact occur. Finally, people tend to engage prediction illusions, which refer to individuals' tendencies to be overconfident in their certainty that particular events will occur in their futures. This can also spill into an individual's perceived ability to predict future emotions. Individuals tend to be hyper-focused on their present internal states that how they may feel in the future, is overlooked. Therefore, there are many possible types of inaccuracies that can occur when evaluating an individual's self-knowledge (Hansen & Pronin, 2012).

Contemporary perspectives on the development of self-knowledge include imitation, perceptual mechanisms, statistical sensitivity, awareness of capacities, memory maturation, a common neural bases to the self, social attachment, and the developmental sequencing of knowledge acquisition processes. Development in

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self-knowledge involves representations (physical representations of the self and representations of capabilities) and personal memories (Hart & Matsuba, 2012).

Personality Self-Knowledge (PSK)

The congruence between a person's view of his or her own personality and his or her true personality characteristics has been defined as personality self-knowledge (PSK) (Back & Vazire, 2012). Researchers have been particularly interested in understanding the accuracy of one's own perception of his/her personality, and what factors contribute to a more accurate view of oneself. People are generally likely to not only describe themselves by their most important personality traits, but also to think about themselves in that way. However, that does not necessarily imply that the perception of those personality characteristics is accurate. Researchers appear to be split in two opposing directions when considering the accuracy of people's PSK. Researchers who believe that people do have accurate PSK tend to derive their opinions based on the utilization of self-report measures and the notion that only that individual knows how he or she is feeling and experiencing. However, other researchers who believe that people tend to have inaccurate PSK base their opinion on studies indicating biases in explicit self-views, self-enhancement, social desirability, and limits of introspection. There is a lack of empirical evidence to support either viewpoint regarding the level of accuracy an individual possesses about his or her PSK. Additionally, there is a lack

of empirical understanding about the underlying mechanisms of PSK, its determinants, and its consequences (Back & Vazire, 2012).

There is currently no direct way to measure a person's true personality characteristics, nor is there a clear definition of what is a true personality characteristic. While there is not one standard measure of "real" personality traits, there are several factors that different measures assess. These include self-reports measuring explicit self-concepts, implicit self-concepts of personality (cognitions and emotions), behaviors, and the reputation of the person. Implicit association tests (IATs) are typically used as indirect measures of one's implicit self regarding personality. Direct observation of how a person acts in social situations can evaluate a person's behaviors. Personality reports completed by reliable and close friends and family, are also often used to measure a person's reputation (Back & Vazire, 2012).

These criteria for the definition of what falls under PSK help outline four main domains of PSK. The first domain is explicit-implicit consistency, or the agreement between a person's explicit personality self-views and his or her implicit self-concept of personality. Explicit self-perceptions involve conscious and controlled processing, while implicit self-perceptions involve automatic and nonconscious processing. Therefore, this domain can be explained as the specific access one has to his or her inner self. This evaluates the degree of alignment between how a person consciously describes him or herself, and what his or her

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self-representations might be. The second domain of PSK is behavioral prediction, or the degree of congruence between a person's self-views and his or her actual behaviors. In this domain, behavioral measures are able to be utilized in order to empirically evaluate how a person is actually behaving, without relying solely on self-reporting. A person's PSK will be higher, or more accurate when self-reported personality characteristics correspond to the person's actual behavior. The third domain of PSK is self-other agreement, or how well a person's self-views converge with how others perceive his or her personality. The reputation of the person in question is based on the opinions of others. A person with higher PSK will judge him or herself similarly to how others perceive him or her. Others have the direct ability to observe how the person in question responds to his or her environment in various settings. Further, some personality traits depend on how others perceive another person in order for them to be accurate. Back and Vazire (2012) give the example of being considered charming or funny as characteristics of which others would have to agree upon, rather than the individual being able to accurately make that perception solely by his or herself. This domain is typically measured by correlating self-reports and other-reports. The other-reports are averaged among all of the close informants, where those from different social contexts, provide additional information and more global snapshot of the individual's personality. Having multiple informants from various social contexts will lead to the possibility of a more accurate judgment of personality. The problem with other-reports is that

usually the individual chooses who will complete such a report, indicating the potential for biased judgments of the person's personality. The last domain of PSK is meta-accuracy, which is the degree to which a person understands how other people perceive his or her personality. Despite the benefits of the four domains of PSK, limitations include lower validity and reliability of indirect measures of personality for explicit-implicit consistency, lower feasibility evaluating and operationalizing specific behaviors for observation, and the assumption that others' perceptions of an individual's personality is accurate for self-other agreement and meta-accuracy (Back & Vazire, 2012).

Research has provided evidence for self-reports of personality traits, as well as self-reports of specific behaviors, as predictors of behaviors in a social context. Additionally, studies have provided support for accuracy of personality perception couple with the personality perceptions of strangers regarding videotaped behavior, streams of thought, written short stories, offices and bedrooms, music preferences, personal websites, online social media profiles, e-mail addresses, and physical appearance. However, there are still significant blind spots that people tend to have with his or her PSK and the predictability of corresponding behavior. The actual depth of knowledge one has about his or her personality is a factor, as well. A person may accurately be known to be extroverted, but may not be able to accurately quantify to what degree on a continuum. Another limitation is that there are mixed findings for people being able to accurately evaluate how others perceive

him or herself, even if he or she knows the others are in disagreement about the perception (Back & Vazire, 2012).

In summary, self-views of personality traits are moderate predictors of behaviors and reputations. Also, while people have a relative notion about their reputations, they are likely to have much insight into how others perceive them. The four domains previously described to evaluate PSK holds some validity and are able to independently predict behavior, thus concluding the perceptions are at least based in some form of reality. It is still important to note, however, that all the four domains have substantial blind spots in PSK accuracy (Back & Vazire, 2012).

Based on an accuracy model developed by Funder (1999), there are multiple main effects and interactive moderator effects on PSK (Back & Vazire, 2012). Unfortunately, the mechanisms may diverge relevant to the specific function of a personality trait, the perceiver, and the available information for a situation. Therefore, the perceiver, the characteristics of the trait, and information, can be considered moderators of PSK. A good perceiver of his or herself is someone who can integrate valid information without bias and someone who provides ample and valid information about his or herself. Researchers currently hypothesize higher information processing capacity, emotional stability, extraversion, and agreeableness to be predictors of people who would be better able to have more accurate self-knowledge or insight about his or her specific personality traits.

However, more research is needed to provide sufficient empirical evidence for these factors and what roles they may play (Back & Vazire, 2012).

Theories of Personality

Matthews, Deary, Whiteman, and Martha (2003) broke down the definition of personality into two main points. First, they define personality as stable and consistent traits of a person that characterizes his or her "true nature." Although this definition allows for variances in behavior depending on the situation, the person in question still has core traits that define him or herself. The stability of such traits separates itself from aspects of a person that are considered to be more transient, such as mood states. Additionally, the second main point in the definition is that personality traits have a direct influence on a person's behavior. According to traditional trait theories, certain personality traits cause a person to engage in certain behaviors, which is also known as causal primacy. Additionally, traditional trait theories state that these personality characteristics are influenced by one's genetic makeup and are core elements of a person, which are also known by some as the inner locus. On the other hand, more modern theories about personality traits argue that traits do in fact exist but may not serve a causal function. Modern theories also dispute the inner locus viewpoint, and suggest personality traits are affected by the environment and social interactions, and not purely by genetics. As a result of these differing perspectives (and others that my be offered), there appears to be no

currently universally accepted and empirically supported theory of traits (Matthews et al., 2003).

      Hans Eysenck's theory of personality traits focuses on three main factors, which are neuroticism, extraversion-introversion, and psychoticism. These traits are evaluated through self-report, such that an individual responds "yes" or "no" to various questions. The current version of this questionnaire is known as the Eysenck Personality Questionnaire-Revised (EPQ-R). He described a person high on neuroticism as someone who appears to be more anxious, worrisome, depressed, emotional, and have more somatic complaints. He described a person low on neuroticism are more adaptable and can recover more quickly from an emotional upset, indicative of a more calm and worry-free disposition. Eysenck described a person high on the extroversion factor as someone who is sociable, humorous, craving excitement, sometimes unreliable, quick to lose his or her temper, and more likely to take risks. On the opposite end of that dimension is introversion, where the person can be described as serious, quiet, closely controls his or her emotions, is reliable, has high ethical values, and as someone who prefers to engage in activities alone, rather than with others. On his third factor of psychoticism, he described high scorers to be unusual, solitary, problematic, aggressive, sometimes cruel, and to be lacking empathy. Low scorers on the other hand, are described as being more "normal". Eysenck however, later recommended the neuroticism factor be renamed as emotionality and the psychoticism to renamed as superego control. This was due

to his dislike of the negative connotations with such words, as these factors share some of the same descriptions of personality disorders and other psychological conditions. Eysenck wanted to distinguish these factors as ones that many people have to some degree, which is normal and does not necessarily indicate clinical psychopathology. Additionally, Eysenck believed that personality traits have a strong biological influence, which is further shaped by natural selection (Matthews et al., 2003).

Costa and McCrea developed a dimensional five factor model, which was partially created because the researchers believed there were more than three factors of personality (Eysenck), but less than sixteen (Cattell). This theory of "the big five" factor model has substantial empirical support (Matthews et al., 2003). In fact, their model has been used as the foundation of the NEO-Personality Inventory-Revised (NEO-PI-R), a 240 item self-report questionnaire with the items ranked on a five-point scale (strongly agree to strongly disagree) based on the following five domains, or dimensions. The five dimensions are Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness (N, E, O, A, and C). A person scoring high on neuroticism is likely to be anxious, angry, hostile, depressed, impulsive, vulnerable, and self-conscious. A high score on extraversion indicates someone who is assertive, warm, active, stimulus-seeking, positive, and sociable. A person scoring high on openness is likely to think abstractly, engage in fantasy, and willing to try new things. Scoring high on agreeableness indicates a person who is

likely to be trustworthy, straightforward, compliant, modest, altruistic, and kind. Scoring high on the last dimension of conscientiousness indicates a person who is likely to be competent, orderly, goal-oriented, self-disciplined, deliberate, and dutiful. The five factor model of Costa and McCrae are not directly associated with psychological conditions, unlike Eysenck's three factor model. At first, Costa and McCrae did not view these dimensions of personality as having a basis in genetics, they later believed them to be expressions of a person's genotype (Matthews et al., 2003).

Raymond Cattell established 23 primary factors that are fundamental to a person's personality (Matthews et al., 2003). From those 23 factors, he narrowed them down to 16 factors that were the most robust, and which later formed the basis for the Sixteen Personality Factor Questionnaire (16PF), which is currently in its fifth edition. This measure has become one of the most widely utilized self-report measures for personality traits. The 16 traits are Warmth (A), with high scores reflecting an outgoing, warmhearted individual, and low scores suggesting a reserved and detached style; Reasoning (B), where high scores suggest a more abstract, higher mental capacity, and lower scores reflecting a more concrete style of thinking and lowered mental capacity; Emotional Stability (C) where high scores suggest an unemotional, calm individual, and lower scores indicate an individual who is emotional and labile; Dominance (E) with high scores reflecting an assertive, dominant individual, and low scores suggesting a humble and cooperative

style; Liveliness (F) with high scores suggesting an individual who is cheerful and lively, and low scores suggesting an individual who is sober and reticent; Rule-Conscientiousness (G) with high scores reflecting conscientiousness and persistence, and low scores reflecting expedience and lack of discipline; Social Boldness (H) where high scores reflect venturesome and socially bold individuals, and low scores reflect shy and retiring individuals; Sensitivity (I) with high scores suggesting an individual who is tough-minded and self-reliant, and low scores suggesting an individual who is tender-minded and sensitive; Vigilance (L) with high scores suggesting someone who is suspicious and skeptical, and low scores suggesting someone who is trusting and accepting; Abstractedness (M) with high scores reflecting someone who is imaginative and free-spirited, and with low scores reflecting someone who is practical and conventional; Privateness (N) with high scores suggesting an individual who is sensible and discreet, and low scores suggesting an individual who is forthright and straightforward; Apprehension (O) with high scores reflecting someone who is guilt-prone and worrisome, and low scores reflecting someone who is resilient and self-assured; Openness to Change (Q1) where high scores reflect a progressive an experimental individual, and where low scores reflect a conservative and traditional individual; Self-Reliance (Q2) with high scores suggesting a self-sufficient and resourceful individual and low scores suggesting a group-dependent and affiliative individual; Perfectionism (Q) with high scores suggesting a controlled and compulsive individual, and with low scores

suggesting an undisciplined and lax individual; and Tension (Q4) where high scores reflect a tense and driven individual, and where low scores reflect a relaxed and tranquil individual (Matthews et al., 2003).

There are also five global factors which include Extraversion where high scores indicate a socially participating and extroverted individual, and low scores indicate a socially inhibited and introverted individual; Anxiety where high scores indicate a perturbable and anxious individual, and low scores indicate an unperturbable and low anxiety individual; Tough-mindedness with high scores reflecting someone who is resolute unempathetic and has tough poise, and with low scores reflecting someone who is receptive, open-minded, and intuitive; Independence with high scores reflecting a persuasive, willful, and independent individual, and with low scores reflecting an accommodating, agreeable, selfless, and a subdued individual; and Self-control with high scores suggesting an inhibiting of urges and self-controlled individual and with low scores suggesting someone who is unrestrained, follows urges, and is uncontrolled. Primary factors Warmth (A), Liveliness (F), Social Boldness (H), Privateness (N), and Self-Reliance (Q2) load onto the Extraversion global factor scale. Emotional Stability (C), Vigilance (L), Apprehension (O), and Tension (Q4) load onto the Anxiety global factor. Warmth (A), Sensitivity (I), Abstractedness (M), and Openness to Change (Q1) are the primary factors that load on the Tough-mindedness global factor scale. Dominance (E), Social Boldness (H), Vigilance (L), and Openness to Change (Q1)

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are the primary factors that load on the Independence global factor scales. Lastly, the primary factors that load on the Self-Control global factor scale are Liveliness (F), Rule-Consciousness (G), Abstractedness (M), and Perfectionism (Q3) (Conn & Rieke, 1994).

The fifth edition includes 185 items for the 16 primary factor scales with 10 to 15 items per factor, as well as 12 items on the Impression Management (IM) scale. It requires a fifth-grade reading level, in contrast to the previous edition's requirement of a seventh grade reading level.

The fifth edition of the 16PF also includes three response style scales used to measure validity, which are Impression Management (IM), Infrequency (INF), and Acquiescence (ACQ) scales (Boyle, Saklofske, & Matthews, 2015). The IM scale contains 12 items on a three-point rating and is used to measure if a person is "faking good" (high scores) or "faking bad" (low scores) (Boyle, et al., 2015). The IM scale is considered to have good reliability including the internal consistency of a Cronbach alpha coefficient of 0.63, a two-week test-retest coefficient of 0.70, and a two-month coefficient of 0.63 (Boyle, et al., 2015). The IM scale is considered to have good convergent validity with a positive correlation of 0.54 when compared to social desirability scares of the Marlowe-Crowne Social Desirability Scale and a positive correlation of 0.49 when compared with the Balanced Inventory of Desirable Responsible (BIDR) (Boyle, et al., 2015). It also has good divergent/discriminant validity with scales B, E, F, I, L, M, N, O, Q1, Q2, and Q4

(Boyle, et al., 2015). Further, the IM scale has good criterion validity as it correlates approximately the same with self-deception and other-deception scales of the Balanced Inventory of Desirable Responding and the Marlowe-Crowne Social Desirability (Scale Boyle, et al., 2015). The INF scale contains 32 items used to measure the degree of random responding (Conn & Rieke, 1994). The ACQ scale contains 103 true-false items and measures the degree of agreeability of a person's responding which is independent of the content of the items (Conn & Rieke, 1994). Additionally, the internal consistency on average for all for the 16 factors total, is a Cronbach alpha of 0.74 (Matthews et al., 2003).

The Scale of Accurate Personality Prediction (SAPP)

The Scale of Accurate Personality Prediction (SAPP) was developed by Miller (2000) in order to be able to evaluate an individual's accuracy in prediction of his or her own personality. This measure was created by enlisting 196 participants to not only complete the 16PF, but to also use the 16PF scoring form (See Appendix) to predict their respective scores across each of the 21 16PF primary and global factors. The SAPP score was obtained by utilizing the following equation:

$$SAPP = [OSA-PSA] + [OSB-PSB] + [OSC-PSC] + [OSE-PSE] + [OSF-PSF] + [OSG-PSG] + [OSH-PSH] + [OSI PSI] + [OSL-PSL] + [OSM-PSM] + [OSN-PSN] + [OSO PSO] + [OSQ1-PSQ1] + [OSQ2-PSQ2] + [OSQ3-PSQ3]$$

$$+[OSQ4\text{-}PSQ4] +[OSEX\text{-}PSEX] + [OSAX\text{-}PSAX]$$

$$+[OSTM\text{-}PSTM] +[OSIN\text{-}PSIN] +[OSSC\text{-}PSSC].$$ Here, OSA is the

obtained score on Scale A, PSA is the predicted score on scale A,

and so on for all 21 factors.

High scores obtained through this formula would indicate less accurate self-predictions, whereas low scores would indicate more accurate self-predictions. The possible obtainable scores range from 0 (complete accuracy) to 189 (complete inaccuracy). (Numerous multiple regression analyses were performed and identified Tough-Mindedness (-), Independence (-), and Anxiety (-) as the best global factors in predicting the SAPP Scores. The analyses also identified Reasoning (B+), and Tension (Q4-) as the best primary factors in predicting the SAPP scores). Therefore, individuals who obtained high SAPP scores can be characterized as reserved, introverted, private, unsentimental, more concrete in reasoning, and empathic. Individuals who obtained low SAPP scores can be characterized as trusting of others, sensitive, open to change, intuitive, outgoing, more abstract in their reasoning, and more empathic (DiLullo, 2019).

Studies Evaluating the Reliability, Validity, and Generalizability of the SAPP

Haight's (2000) study found significant results indicating individuals are more likely to rate themselves towards the right side of the continuum of the 16PF, whether it was considered socially desirable or not. However, Van Sickle (2003) attempted to replicate Haight's (2000) study but to no avail. Additionally, the

Impression Management Scale of the 16PF indicated that individuals also did not respond in an overtly socially desirable manner (Van Sickle, 2003). However, it is important to note that the results did show a tendency to skew towards socially desirable directions on the continuum on the Warmth, Emotional Stability, and Self-Control scales (Van Sickle, 2003).

Hood (2001) made the first attempt to validate the SAPP through convergent validity with the Private Self-Consciousness score of the Self-Consciousness Scale. While the results of Hood's (2001) study did not indicate significant correlations with the Private Self-Consciousness score of the Self-Consciousness Scale, it did indicate divergent validity with the Tennessee Self-Concept Scale. Therefore, this provided evidence that it is not a measure of self-esteem (Hood, 2001). A study by Anderson (2002) hypothesized that individuals who score high on the Self-Monitoring Scale would obtain lower scores on the SAPP. Results from Anderson (2002) were not significant and thus, the SAPP is not a measure of an individual's level of self-awareness. A study by Winter (2002) utilized group comparison methodology in attempts to validate the SAPP measure. Winter (2002) hypothesized that graduate psychology students should have higher degrees of self-knowledge and have greater ability to predict their own personality traits than graduate engineering students. However, the results between the two groups were not significant and thus, construct validity could still not be established (Winter, 2011). The following year, Glywasky (2003) utilized Hood's (2001) research idea

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but with a much larger sample size. However, increasing the sample size still did not produce significant results and was unable to validate the SAPP (Glywasky, 2003). Layton (2005) utilized the technique of target methodology which entailed assessing a correlation between self-prediction and the prediction of significant others. Again, utilizing this different research method did not produce a significant correlation (Layton, 2005). Hickey (2005) conducted a study with similar methodology, but with family members as the target participant predictors. This study also did not produce significant results, despite greater correlations (Hickey, 2005). Blankemeier's (2007) study attempted to replicate Hickey's (2005) study and found a significant correlation (r = .283) between target subjects and their family members. Afandor's (2006) study entailed a clinician's ratings of the degree of self-knowledge and self-awareness a client had compared to the clients' SAPP scores but did not produce any significant results either. Interestingly, the correlations were in the opposite direction of the proposed hypothesis (Afandor, 2006). Grossenbacher's 2006 study found a significant difference between graduate psychology students' scores and graduate engineering students' scores (t =-4.247, p<.01).

However, Pass's (2013) study did not find a significant correlation between the sample and the normative populations of the 16PF, SAPP, ISKS. Silva (2011) had 62 participants complete the SAPP measure twice, with a two-week gap in between, in order to assess the SAPP's test-retest reliability. She found a significant

correlation (r = .397) however, not as strongly as was predicted. Further, support for

the test-retest reliability of the SAPP began to grow as Sverdlova (2012) found a

significant correlation (r = .466) from two to four weeks, despite a lower sample

size. Hirsch (2012) on the other hand, replicated this study with more participants

and found a moderate correlation (r = .566), indicating more support for the SAPP's

test-retests reliability. When Elghossain (2012) assessed test-retest reliability of the

SAPP, she retested participants after six weeks and found a strong correlation (r =

.772). Stewart's (2017) results revealed a significant, moderate correlation (r^2 =

.584), which exceeded Silva's (2011) and Hirsh's (2012) studies of r^2 = .397 and r^2

= .566 respectively for test-retest reliability of the SAPP. These findings add

support of the SAPP as a reliable measure of self-knowledge (Stewart, 2017). It

should also be noted that the test-retest correlations which were found to be

significant appear to be somewhat lower than one might expect. These lowered

numbers are such because the SAPP scores reflect the combinations of 21 different

variables, each having its own test-retest correlation below the 1.00 upper limit.

Combining each variable must therefore result in a lower number that what any one

variable might have.

     McElligot's (2014) study was used to create the STEN scores which created

the ability to convert SAPP scores to have 0 reflect the lowest prediction score and

189 to reflect the highest prediction score. This was conducted by using each

previously derived SAPP score and subtracting them from 189. In fact, this linear

transformation did not indicate fundamental changes to the SAPP values, as indicated by a significant correlation of -1.00 (McElligot, 2014).

Zeng's (2015) study evaluated the generalizability of the SAPP to the Asian population. The results indicated that when comparing the group mean of SAPP scores of the Asian sample to three random samples and in two of those samples, there was no significant difference in the mean SAPP scores (Zeng, 2015). Therefore, this lends support to the generalizability of the SAPP to the Asian population. However, the one of the random sample's mean did reveal a significant difference for the scales Social Boldness (H) and Independence (IN), which suggests the Asian participants in the sample were more shy, timid, agreeable, and accommodating than participants in the random sample (Zeng, 2015). Additionally, another comparison with a different random sample also found significant differences in Emotional Stability (C), Dominance (E), Social Boldness (H), Openness to Change (Q1), and Independence (IN). Those results indicate the participants in the Asian sample were more reactive, cooperative, deferential, shy, traditional, and accommodating than participants in the random sample (Zeng, 2015). Further, comparison with the third random sample revealed a significant difference for Openness to Change (Q1) and Self-Reliance (Q2), which indicates the Asian participants are more traditional, attached to the familiar, and group-oriented than participants in that random sample (Zeng, 2015).

Statement of Purpose

The aim of the present study was to build upon Miller's (2000) research with the development of the SAPP measure by attempting to identify individual factors from the 16PF that are more able to be self-predicted by participants. This included the 16 Primary Factors and the 5 Global Factors. A Pearson correlation was performed on the entire sample of participants examining the relationships between the actual obtained scores and the predicted score for each respective trait of the 16PF. Additionally, the participants were divided into four random samples where correlational analyses was performed on each one, examining the relationships between the obtained and predicted scores. The hope was to provide evidence in support of Emotional Stability (C), Dominance (E), Apprehension (O), Suspiciousness (L), Tension (Q4), and Tough-Mindedness (TM) as being traits that participants are generally better able to accurately self-predict.

Method

Participants

      The participants are 609 individuals who were from previous SAPP studies and whose data had been combined into one database. This archival data was collected over the past 15 years, in a typically non-randomized manner. These individuals ranged from college students, other professionals, and people from various other communities.

Procedure

      All participants completed the 16PF along with a 16PF scoring sheet (See Appendix for a copy of this form). On the scoring sheet, participants were instructed to rate themselves on the 16 personality factors and the 5 global factors of the 16PF. After both of these tasks were completed, comparisons were evaluated between the participants' self-ratings and the actual 16PF scores. This was evaluated through utilization of the adjusted formula detailed in the background section. Thus, SAPP scores were computer for each individual participant.

Analysis

      Statistical analysis were completed through utilization of Pearson correlations between the predicted and obtained STEN scores amongst the 2116PF variables. The higher the correlations across the 21 variables, the closer the accuracy of the predicted scores would be. Additionally, the range, mean, and standard deviation of scores for each of the 42 variables were included. The sample

of 609 participants was divided into four sub-samples through random sampling.

The analyses were then repeated across each of the four sub-samples.

Demographics for each of the sub-samples are reported, as well.

Hypotheses

Additionally, based on Dilullo's (2019) findings regarding the 16PF scores predicting SAPP measure scores as a whole, it was hypothesized that individuals in the general population, would be more accurately able to self-predict specific traits over other traits. It was hypothesized that the primary factors of Emotional Stability (C+), Dominance (E-), Vigilance (L-), Apprehension (O+), and Tension (Q4+) would traits that individuals in general are more accurately able to self-predict. Further, it was hypothesized that the global factor of Tough-Mindedness (TM-) would be more likely to be accurately self-predicted by individuals.

Results

Demographics

Specific Demographics results can be found for the 609 participants in the total sample in Table 1. Participants' ages ranged from 16 to 81 years old. The mean age of participants was 28.65 with a standard deviation of 12.63. The percentage of female participants was 57.1% while the percentage of male participants was 42.9%. In regard to ethnicity, 75.2% of participants self-identified as Caucasian, 12.6% Hispanic, 3.9% Asian, 2.5% African American, .2% Indian American, and 5.6% who self-identified as other. The percentage of participants who were students was 62.1%, 20.6% were white collar, 1.6% were blue collar, 3.8% were retired, 3% were unemployed/homemaker, and 8.9% held employment in a category not described as one of those previously mentioned. Regarding marital status, 72.5% of participants were single, 20.7% were married, 5% were divorced, 1.1% were separated, and .7% were widowed. The participants were primarily from the Southeast, making up 81.1% of the sample. For the rest of the participants, 10.5% were from the Northeast, 4.1% were from the Southeast, 4.1% were from the Midwest, and .2% were from Canada. In terms of years of education, the majority of participants had more than or equal to 17 years of education at 39.5%, while 23.6% had 16 years, 31.9% had 14-15 years, 4.8% had 12-13 years, and only .2% had less than 12 years of education.

Total Sample Correlation Analyses

Statistical analyses were performed through Pearson's correlation to examine the relationship between the obtained and predicted 16PF trait scores. P1 through P21 represented the predicted score variables. First, correlations were performed on the entire sample of 609. Next, correlations were also performed for four random samples with 150 participants in each of the samples.

From the total sample displayed in Tables 2 and 3, Warmth (A) had a mean of 5.52 and a standard deviation of 1.84, Reasoning (B) had a mean of 5.73 and a standard deviation of 1.73, Emotional Stability (C) had a mean of 4.95 and a standard deviation of 1.61, Dominance (E) had a mean of 5.11 and a standard deviation of 1.61, Liveliness (F) had a mean of 5.97 and a standard deviation of 1.78, Rule-Consciousness (G) had a mean of 4.74 and a standard deviation of 1.68, Social Boldness (H) had a mean of 5.40 and a standard deviation of 1.90, Sensitivity (I) had a mean of 5.55 and a standard deviation of 1.83, Suspiciousness (L) had a mean of 6.16 and a standard deviation of 1.92, Abstractness (M) had a mean of 5.88 and a standard deviation of 1.64, Privateness (N) had a mean of 5.45 and a standard deviation of 1.91, Apprehension (O) had a mean of 5.95 and a standard deviation of 1.60, Openness to Change (Q1) had a mean of 5.79 and a standard deviation of 1.84, Self-Reliance (Q2) had a mean of 5.91 and a standard deviation of 1.73, Perfectionism (Q3) had a mean of 5.46 and a standard deviation of 1.71, Tension (Q4) had a mean of 5.70 and a standard deviation of 1.51, Extraversion Global (EX) had a mean of 5.51 and a standard deviation of 1.85,

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Anxiety Global (AX) had a mean of 6.13 and a standard deviation of 1.71, Tough-Mindedness Global (TM) had a mean of 5.26 and a standard deviation of 1.73, Independence Global (IN) had a mean of 5.46 and a standard deviation of 1.53, and Self-Control Global (SC) had a mean of 4.92 and a standard deviation of 1.46.

Predicted Warmth (P1) had a mean of 6.66 and a standard deviation of 2.37, Predicted Reasoning (P2) had a mean of 5.29 and a standard deviation of 2.13, Predicted Emotional Stability (P3) had a mean of 6.31 and a standard deviation of 2.47, Predicted Dominance (P4) had a mean of 5.11 and a standard deviation of 2.19, Predicted Liveliness (P5) had a mean of 5.77 and a standard deviation of 2.31, Predicted Rule-Consciousness (P6) had a mean of 6.02 and a standard deviation of 2.20, Predicted Social Boldness (P7) had a mean of 5.73 and a standard deviation of 2.36, Predicted Sensitivity (P8) had a mean of 6.31 and a standard deviation of 2.39, Predicted Suspiciousness (P9) had a mean of 5.18 and a standard deviation of 2.22, Predicted Abstractness (P10) had a mean of 5.02 and a standard deviation of 2.31, Predicted Privateness (P11) had a mean of 5.05 and a standard deviation of 2.24, Predicted Apprehension (P12) had a mean of 5.16 and a standard deviation of 2.28, Predicted Openness to Change (P13) had a mean of 5.80 and a standard deviation of 2.38, Predicted Self-Reliance (P14) had a mean of 5.82 and a standard deviation of 2.42, Predicted Perfectionism (P15) had a mean of 6.10 and a standard deviation of 2.46, Predicted Tension (P16) had a mean of 5.63 and a standard deviation of 2.35, Predicted Extraversion Global (P17) had a mean of 5.92 and a standard deviation of

2.49, Predicted Anxiety Global (P18) had a mean of 5.45 and a standard deviation

of 2.26, Predicted Tough-Mindedness Global (P19) had a mean of 4.34 and a

standard deviation of 2.26, Predicted Independence Global (P20) had a mean of

5.41 and a standard deviation of2.18, and Predicted Self-Control (P21) had a mean

of 5.76 and a standard deviation of 2.19. The means and standard deviations for the

four random samples can be found on Tables 4 through 11. Tables 4 and 5

correspond to random sample 1, Tables 6 and 7 correspond to random sample 2,

Tables 8 and 9 correspond to random sample 3, and Tables 10 and 11 correspond to

random sample 4.

 With a medium, close to large effect size, Social Boldness (H) was

significantly correlated with Predicted Social Boldness (P7), $r = .451$, $p<.001$. With

other medium effect sizes, Extraversion Global (EX) was significantly correlated

with Predicted Extraversion Global (P17), $r = .394$, $p<.001$, Self-Reliance (Q2) was

significantly correlated with Predicted Self-Reliance (P14), $r = .350$, $p<.001$,

Perfectionism (Q3) was significantly correlated with Predicted Perfectionism (P15),

$r = .325$, $p<.001$, and Privateness (N) was significantly correlated with Predicted

Privateness (P11), $r = .324$, $p<.001$.

 With small effect sizes, Abstractness (M) was significantly correlated with

Predicted Abstractness (P10), $r = .287$, $p<.001$, Liveliness (F) was significantly

correlated with Predicted Liveliness (P5), $r = .278$, $p<.001$, Apprehension (O) was

significantly correlated with Predicted Apprehension (P12), $r = .275$, $p<.001$,

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Dominance (E) was significantly correlated with Predicted Dominance (P4), $r =$ .273, $p<.001$, Anxiety Global (AX) was significantly correlated with Predicted Anxiety Global (P18), $r = .263$, $p<.001$, Openness to Change (Q1) was significantly correlated with Predicted Openness to Change (P13), $r = .238$, $p<.001$, Tension (Q4) is significantly correlated with Predicted Tension (P16), $r = .237$, $p<.001$, Emotional Stability (C) was significantly correlated with Predicted Emotional Stability (P3), $r = .236$, $p<.001$, Sensitivity (I) was significantly correlated with Predicted Sensitivity (P8), $r = .222$, $p<.001$, Warmth (A) was significantly correlated with Predicted Warmth (P1), $r = .196$, $p<.001$, Rule-Consciousness (G) was significantly correlated with Predicted Rule-Consciousness (P6), $r = .191$, $p<.001$, Tough-Mindedness Global (TM) was significantly correlated with Predicted Tough-Mindedness Global (P19), $r = .178$, $p<.001$, Suspiciousness (L) was significantly correlated with Predicted Suspiciousness (P9), $r = .169$, $p<.001$, Self-Control Global (SC) was significantly correlated with Predicted Self-Control Global (P21), $r = .158$, $p<.001$, and Independence Global (IN) was significantly correlated with Predicted Independence Global (P20), $r = .151$, $p<.001$. There was no significant correlation between Reasoning (B) and Predicted Reasoning (P2).

Random Sample 1 Correlation Analyses

Correlational analyses were performed for the first random sample of 150 participants, which is shown on Table 4. Results indicated a medium, close to a large effect size for Social Boldness (H), which was significantly correlated with

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Predicted Social Boldness (P7), *r* = .465, *p*<.001. For other medium effect sizes, Extraversion Global (EX) was significantly correlated with Predicted Extraversion Global (P17), *r* = .393, *p*<.001. Privateness (N) was significantly correlated with Predicted Privateness (P11), *r* = .308, *p*<.001. Perfectionism (Q3) was significantly correlated with Predicted Perfectionism (P15), *r* = .306, *p*<.001

With small effect sizes, Self-Reliance (Q2) was significantly correlated with Predicted Self-Reliance (P14), *r* = .298, *p*<.001, Abstractness (M) was significantly correlated with Predicted Abstractness (P10), *r* = .250, *p*<.001, Dominance (E) was significantly correlated with Predicted Dominance (P4), *r* = .249, *p*<.001, Liveliness (F) was significantly correlated with Predicted Liveliness (P5), *r* = .241, *p*<.001, Tough-Mindedness Global (TM) was significantly correlated with Predicted Tough-Mindedness Global (P19), *r* = .238, *p*<.001, Tension (Q4) was significantly correlated with Predicted Tension (P16), *r* = .231, *p*<.001, Emotional Stability (C) was significantly correlated with Predicted Emotional Stability (P3), *r* = .224, *p*<.001, Self-Control Global (SC) was significantly correlated with Predicted Self-Control Global (P21), *r* = .215, *p*<.001, and Sensitivity (I) was significantly correlated with Predicted Sensitivity (P8), *r* = .207, *p*<.001.

Warmth (A) was not significantly correlated with Predicted Warmth (P1), Reasoning (B) was not significantly correlated with Predicted Reasoning (P2), Rule-Consciousness (G) was not significantly correlated with Predicted Rule-Consciousness (P6), Suspiciousness (L) was not significantly correlated with

Predicted Suspiciousness (P9), Apprehension (O) was not significantly correlated with Predicted Apprehension (P12), Openness to Change (Q1) was not significantly correlated to Predicted Openness to Change (P13), Anxiety Global (AX) was not significantly correlated with Predicted Anxiety Global (P18), and Independence Global (IN) was not significantly correlated with Predicted Independence (P20).

Random Sample 2 Correlation Analyses

Correlational analyses were performed for the second random sample of 150 participants, which can be seen on Table 6. indicated Extraversion Global (EX) was significantly correlated with Predicted Extraversion Global (P17), $r = .404$, $p<.001$, Social Boldness (H) was significantly correlated with Predicted Social Boldness (P7), $r = .392$, $p<.001$, Privateness (N) was significantly correlated with Predicted Privateness (P11), $r = .337$, $p<.001$, Perfectionism (Q3) was significantly correlated with Predicted Perfectionism (P15), $r = .335$, $p<.001$, Self-Reliance (Q2) was significantly correlated with Predicted Self-Reliance (P14), $r = .333$ $p<.001$, and Abstractness (M) was significantly correlated with Predicted Abstractness (P10), $r = .326$, $p<.001$, all with medium effect sizes.

Apprehension (O) was significantly correlated with Predicted Apprehension (P12), $r = .277$, $p<.001$, Liveliness (F) was significantly correlated with Predicted Liveliness (P5), $r = .271$, $p<.001$, Rule-Consciousness (G) was significantly correlated with Predicted Rule-Consciousness (P6), $r = .257$, $p<.001$, Dominance (E) was significantly correlated with Predicted Dominance (P4), $r = .229$, $p<.001$,

Tension (Q4) was significantly correlated with Predicted Tension (P16), $r = .220$, $p<.001$, Openness to Change (Q1) was significantly correlated with Predicted Openness to Change (P13), $r = .210$, $p<.001$, Sensitivity (I) was significantly correlated with Predicted Sensitivity (P8), $r = .205$, $p<.001$, and Emotional Stability (C) was significantly correlated with Predicted Emotional Stability (P3), $r = .165$, $p<.05$, all with small effect sizes.

Warmth (A) was not significantly correlated with Predicted Warmth (P1), Reasoning (B) was not significantly correlated with Predicted Reasoning (P2), Suspiciousness (L) was not significantly correlated with Predicted Suspiciousness (P9), Anxiety Global (AX) was not significantly correlated with Predicted Anxiety Global (P18), Tough-Mindedness Global (TM) was not significantly correlated with Predicted Tough-Mindedness Global (P19), Independence Global (IN) was not significantly correlated with Predicted Independence (P20), and Self-Control Global (SC) was not significantly correlated with Predicted Self-Control Global (P21).

Random Sample 3 Correlation Analyses

Correlational analyses performed for the third random sample of 150 participants (Table 8) indicated Extraversion Global (EX) was significantly correlated with Predicted Extraversion Global (P17), $r = .425$, $p<.001$ and Social Boldness (H) was significantly correlated with Predicted Social Boldness (P7), $r = .373$, $p<.001$, both with medium effect sizes.

With small effect sizes, Self-Reliance (Q2) was significantly correlated with Predicted Self-Reliance (P14), $r = .276$ $p<.001$, Liveliness (F) was significantly correlated with Predicted Liveliness (P5), $r = .260$, $p<.001$, Dominance (E) was significantly correlated with Predicted Dominance (P4), $r = .254$, $p<.001$, Perfectionism (Q3) was significantly correlated with Predicted Perfectionism (P15), $r = .246$, $p<.001$, Emotional Stability (C) was significantly correlated with Predicted Emotional Stability (P3), $r = .231$, $p<.001$, Anxiety Global (AX) was significantly correlated with Predicted Anxiety Global (P18), $r = .225$, $p<.001$, Self-Control Global (SC) was significantly correlated with Predicted Self-Control Global (P21), $r = .208$, $p<.05$, Warmth (A) was significantly correlated with Predicted Warmth (P1), $r = .199$, $p<.05$, Privateness (N) was significantly correlated with Predicted Privateness (P11), $r = .174$, $p<.05$, Openness to Change (Q1) was significantly correlated with Predicted Openness to Change (P13), $r = .165$, $p<.05$ and Tension (Q4) was significantly correlated with Predicted Tension (P16) $r = .164$, $p<.05$.

Reasoning (B) was not significantly correlated with Predicted Reasoning (P2), Rule-Consciousness (G) was not significantly correlated with Predicted Rule-Consciousness (P6), Sensitivity (I) was not significantly correlated with Predicted Sensitivity (P8), Suspiciousness (L) was not significantly correlated with Predicted Suspiciousness (P9), Abstractness (M) was not significantly correlated with Predicted Abstractness (P10), Apprehension (O) was not significantly correlated

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with Predicted Apprehension (P12), Tough-Mindedness Global (TM) was not significantly correlated with Predicted Tough-Mindedness Global (P19), and Independence Global (IN) was not significantly correlated with Predicted Independence (P20).

Random Sample 4 Correlation Analyses

Correlational analyses performed for the fourth random sample of 150 participants (Table 10) indicated Social Boldness (H) was significantly correlated with Predicted Social Boldness (P7), $r = .433$, $p<.001$, Extraversion Global (EX) was significantly correlated with Predicted Extraversion Global (P17), $r = .397$, $p<.001$, Liveliness (F) was significantly correlated with Predicted Liveliness (P5), $r = .338$, $p<.001$, Perfectionism (Q3) was significantly correlated with Predicted Perfectionism (P15), $r = .337$, $p<.001$, Apprehension (O) was significantly correlated with Predicted Apprehension (P12), $r = .327$, $p<.001$, Self-Reliance (Q2) was significantly correlated with Predicted Self-Reliance (P14), $r = .325$ $p<.001$, and Openness to Change (Q1) was significantly correlated with Predicted Openness to Change (P13), $r = .315$, $p<.001$, with medium effect sizes for all of them.

Emotional Stability (C) was significantly correlated with Predicted Emotional Stability (P3), $r = .297$, $p<.001$, Privateness (N) was significantly correlated with Predicted Privateness (P11), $r = .297$, $p<.001$, Abstractness (M) was significantly correlated with Predicted Abstractness (P10), $r = .260$, $p<.001$, Tough-Mindedness Global (TM) was significantly correlated with Predicted Tough-

Mindedness Global (P19), $r = .247$, $p<.001$, Sensitivity (I) was significantly

correlated with Predicted Sensitivity (P8), $r = .244$, $p<.001$, Warmth (A) was

significantly correlated with Predicted Warmth (P1), $r = .188$, $p<.05$, and Anxiety

Global (AX) was significantly correlated with Predicted Anxiety Global (P18), $r =$

.178, $p<.05$, all with small effect sizes.

Reasoning (B) was not significantly correlated with Predicted Reasoning

(P2), Dominance (E) was not significantly correlated with Predicted Dominance

(P4), Rule-Consciousness (G) was not significantly correlated with Predicted Rule-

Consciousness (P6), Suspiciousness (L) was not significantly correlated with

Predicted Suspiciousness (P9), Tension (Q4) was not significantly correlated with

Predicted Tension (P16), and Independence Global (IN) was not significantly

correlated with Predicted Independence (P20), and Self-Control Global (SC) was

not significantly correlated with Predicted Self-Control Global (P21).

Across the five correlational analyses, there were significant correlations of

medium effect size between Social Boldness (H) and Predicted Social Boldness

(P7) and between Extraversion Global (EX) and Predicted Extraversion Global

(EX). Social Boldness (H) had the most predictability among the primary traits and

Extraversion Global (EX) had the most predictability among the global factors.

Since Social Boldness (H) loads onto Extraversion Global (EX), it makes sense that

if one had higher predictability, that both of them would have higher predictability.

Perfectionism (Q3) was another trait that consistently had significant correlations

with Predicted Perfectionism (P15), of all medium effect sizes, except for the third

random sample where it was of a small effect. Across the five correlational

analyses, there were no significant correlations found between Reasoning (B) and

Predicted Reasoning (P2). This suggests that consistently people are not very

accurate when it comes to predicting where they fall on the Reasoning (B) trait.

Warmth (A) was another trait that people seemed to struggle with accurately

predicting in themselves. In the total sample, first random sample, and second

random sample, Warmth (A) was not significantly correlated with Predicted

Warmth (P1). In the third and fourth random sample, while showing significant

correlations with Predicted Warmth (P1), they were only of small effect sizes.

Discussion

  The primary goal of this research study was to identify which traits on the 16PF people are generally better able to predict in themselves. If there are traits that people are typically better at predicting in themselves, it would be possible to examine the reasons those traits are more accurately predicted. It would also be possible to see if any of these results can be replicated in various mental health populations in order to see if there are any commonalities within similar diagnoses. The hypothesis of this study was that Emotional Stability (C), Dominance (E), Vigilance (L), Apprehension (O), Tension (Q4), and Tough-Mindedness (TM) would be more accurately self-predicted. While these traits did produce significant correlations within most of the samples, it was very scattered and inconsistent in size of effects. The strength of correlations were much more variable in many of the these traits however, still significant. Therefore, there is evidence to suggest that people have some degree of accuracy in self-prediction of most of the traits from the 16PF. Social Boldness (H) and Extraversion Global (EX) had the strongest effect sizes for their respective predicted variable scores. As mentioned in the results section, the only trait that did not produce significant correlations among any of the samples was between Reasoning (B) and Predicted Reasoning (P2).

Limitations

  Limitations of this research include a lack of diversity in the samples of participants. Participants were primarily Caucasian, single, and students most from

the Southeast area of the country. This of course limits the generalizability of the study and therefore, this research should be replicated within various diverse populations. Additionally, this study was only able to identify the relationship between the actual score on a trait and the predicted score on a trait, it was not possible to discern where on the continuum each participant fell. Therefore, it cannot be known if certain traits were more or less predictable based on specifically where on the continuum they fell.

Future Directions

A future study could evaluate the possibility that accurate self-predictions of certain traits will not necessarily be dichotomous, which means a person may be able to accurately predict one end of the trait spectrum, but not accurately predict the other end of the trait spectrum. This means that individuals may be more likely to self-predict a high score of the specific trait (+) but not the low score of that same trait (-). Additionally, this study should be replicated among diverse populations, including ethnicity, sexuality, sexual identity, socioeconomic status, occupation, and geographical location. This would hopefully increase the generalizability of the research findings. Traits that are consistently found to have statistically significant correlations should be examined for reasons they may be more predictable than others. More research examining the factors contributing to Reasoning (B) having insignificant correlations with the self-prediction would also be important. Gaining knowledge about why this trait is difficult for people to self-predict could

potentially aid in continued insight about the traits that people are better able to

self-predict. It is possible that social desirability plays a significant role in which

traits are more predictable however, it is also possible there are other factors at play

as well.

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Tables

Table 1

Summary of Demographic Statistics
Total Sample

Demographic	Frequency	Percent
GENDER		
Female	348	57.1
Male	261	42.9
ETHNICITY		
Caucasian	458	75.2
African American	15	2.5
Asian	24	3.9
Hispanic	77	12.6
Indian American	1	.2
Other	34	5.6
MARITAL STATUS		
Single	319	72.5
Married	91	20.7
Divorced	22	5.0
Separated	5	1.1
Widowed	3	.7
OCCUPATION		
Student	313	62.1
White Collar	104	20.6
Retired	19	3.8
Unemployed/Homemaker	15	3.0
Blue Collar	8	1.6
GEOGRAPHY		
Southeast	356	81.1
Southwest	18	4.1
Northeast	46	10.5
Midwest	18	4.1
Canada	1	.2
EDUCATION		
Less than 12 Years	1	.2
12-13 Years	29	4.8
14-15 Years	194	31.9
16 Years	144	23.6
17+ Years	241	39.5

Table 2

Means, Standard Deviations, and Correlations for All Obtained Score Variables of Total Sample

Variable	M	SD	P1	P2	P3	P4
1. Warmth (A)	5.52	1.84	.196**	-	-	-
2. Reasoning (B)	5.73	1.73	-	.051	-	-
3. Emotional Stability (C)	4.95	1.61	-	-	.236**	-
4. Dominance (E)	5.11	1.61	-	-	-	.273**

	M	SD	P5	P6	P7	P8
5. Liveliness (F)	5.97	1.78	.278**	-	-	-
6. Rule-Consciousness (G)	4.74	1.68	-	.191**	-	-
7. Social Boldness (H)	5.40	1.90	-	-	.451**	-
8. Sensitivity (I)	5.55	1.83	-	-	-	.222**

	M	SD	P9	P10	P11	P12
9. Suspiciousness (L)	6.16	1.92	.169**	-	-	-
10. Abstractness (M)	5.88	1.64	-	.287**	-	-
11. Privateness (N)	5.45	1.91	-	-	.324**	-
12. Apprehension (O)	5.95	1.60	-	-	-	.275**

	M	SD	P13	P14	P15	P16

	M	SD				
13. Openness to Change (Q1)	5.79	1.84	.238**	-	-	-
14. Self-Reliance (Q2)	5.91	1.73	-	.350**	-	-
15. Perfectionism (Q3)	5.46	1.71	-	-	.325**	-
16. Tension (Q4)	5.70	1.51	-	-	-	.237**

	M	SD	P17	P18	P19	P20
17. Extraversion Global (EX)	5.51	1.85	.394**	-	-	-
18. Anxiety Global (AX)	6.13	1.71	-	.263**	-	-
19. Tough-Mindedness Global (TM)	5.26	1.73	-	-	.178**	-
20. Independence Global (IN)	5.46	1.53	-	-	-	.151**

	M	SD	P21
21. Self-Control Global (SC)	4.92	1.46	.158**

Note $*p < .05$, $**p < .01$. Left column variables = obtained scores. P1 = predicted Warmth (A) scores, P2 = predicted Reasoning (B) scores, P3 = predicted Emotional Stability (C) scores, P4 = predicted Dominance (E) scores, P5 = predicted Liveliness (F) scores, P6 = predicted Rule-Consciousness (G) scores, P7 = predicted Social Boldness (H) scores, P8 = predicted Sensitivity (I) scores, P9 = predicted Suspiciousness (L) scores, P10 = predicted Abstractness (M) scores, P11 = predicted Privateness (N) scores, P12 = predicted Apprehension (O) scores, P13 = predicted Openness to Change (Q1) scores, P14 = predicted Self-Reliance (Q2) scores, P15 = predicted Perfectionism (Q3) scores, P16 = predicted Tension (Q4) scores, P17 = predicted Extraversion Global (EX) scores, P18 = predicted Anxiety Global (AX) scores, P19 = predicted Tough-Mindedness Global (TM) scores, P20 = predicted Independence Global (IN) scores, P21 = predicted Self-Control Global (SC) scores

Table 3

Mean and Standard Deviations for All Predicted Variables of Total Sample

Variable	*M*	*SD*
P1	6.66	2.37
P2	5.29	2.13
P3	6.31	2.47
P4	5.11	2.19
P5	5.77	2.31
P6	6.02	2.20
P7	5.73	2.36
P8	6.31	2.39
P9	5.18	2.22
P10	5.02	2.31
P11	5.05	2.24
P12	5.16	2.28
P13	5.80	2.38
P14	5.82	2.42
P15	6.10	2.46
P16	5.63	2.35
P17	5.92	2.49
P18	5.45	2.26
P19	4.34	2.26
P20	5.41	2.18
P21	5.76	2.19

Note *$p < .05$, **$p < .01$. Left column variables = obtained scores. P1 = predicted Warmth (A) scores, P2 = predicted Reasoning (B) scores, P3 = predicted Emotional Stability (C) scores, P4 = predicted Dominance (E) scores, P5 = predicted Liveliness (F) scores, P6 = predicted Rule-Consciousness (G) scores, P7 = predicted Social

Boldness (H) scores, P8 = predicted Sensitivity (I) scores, P9 = predicted Suspiciousness (L) scores, P10 = predicted Abstractness (M) scores, P11 = predicted Privateness (N) scores, P12 = predicted Apprehension (O) scores, P13 = predicted Openness to Change (Q1) scores, P14 = predicted Self-Reliance (Q2) scores, P15 = predicted Perfectionism (Q3) scores, P16 = predicted Tension (Q4) scores, P17 = predicted Extraversion Global (EX) scores, P18 = predicted Anxiety Global (AX) scores, P19 = predicted Tough-Mindedness Global (TM) scores, P20 = predicted Independence Global (IN) scores, P21 = predicted Self-Control Global (SC) scores

Table 4

Means, Standard Deviations, and Correlations for All Obtained Score Variables of Random Sample 1

Variable	M	SD	P1	P2	P3	P4
1. Warmth (A)	5.53	1.97	.132	-	-	-
2. Reasoning (B)	5.87	1.61	-	.023	-	-
3. Emotional Stability (C)	4.87	1.56	-	-	.224**	-
4. Dominance (E)	5.07	1.73	-	-	-	.249**

	M	SD	P5	P6	P7	P8
5. Liveliness (F)	6.07	1.82	.241**	-	-	-
6. Rule-Consciousness (G)	4.66	1.82	-	.125	-	-
7. Social Boldness (H)	5.49	1.87	-	-	.465**	-
8. Sensitivity (I)	5.61	1.82	-	-	-	.207**

	M	SD	P9	P10	P11	P12
9. Suspiciousness (L)	6.07	1.92	.091	-	-	-
10. Abstractness (M)	5.90	1.73	-	.250**	-	-
11. Privateness (N)	5.26	1.91	-	-	.308**	-
12. Apprehension (O)	5.95	1.70	-	-	-	.140

	M	SD	P13	P14	P15	P16
13. Openness to Change (Q1)	5.81	2.07	.155	-	-	-
14. Self-Reliance (Q2)	5.95	1.78	-	.298**	-	-

15. Perfectionism (Q3)	5.31	1.78	-	-	.306**	-
16. Tension (Q4)	5.74	1.67	-	-	-	.231**

	M	*SD*	P17	P18	P19	P20
17. Extraversion Global (EX)	5.64	1.80	.393**	-	-	-
18. Anxiety Global (AX)	6.15	1.76	-	.098	-	-
19. Tough-Mindedness Global (TM)	5.21	1.82	-	-	.238**	-
20. Independence Global (IN)	5.45	1.60	-	-	-	.136

	M	*SD*	P21
21. Self-Control Global (SC)	4.79	1.52	.215**

Note *p* < .05, ** *p* < .01. Left column variables = obtained scores. P1 = predicted Warmth (A) scores, P2 = predicted Reasoning (B) scores, P3 = predicted Emotional Stability (C) scores, P4 = predicted Dominance (E) scores, P5 = predicted Liveliness (F) scores, P6 = predicted Rule-Consciousness (G) scores, P7 = predicted Social Boldness (H) scores, P8 = predicted Sensitivity (I) scores, P9 = predicted Suspiciousness (L) scores, P10 = predicted Abstractness (M) scores, P11 = predicted Privateness (N) scores, P12 = predicted Apprehension (O) scores, P13 = predicted Openness to Change (Q1) scores, P14 = predicted Self-Reliance (Q2) scores, P15 = predicted Perfectionism (Q3) scores, P16 = predicted Tension (Q4) scores, P17 = predicted Extraversion Global (EX) scores, P18 = predicted Anxiety Global (AX) scores, P19 = predicted Tough-Mindedness Global (TM) scores, P20 = predicted Independence Global (IN) scores, P21 = predicted Self-Control Global (SC) scores

Table 5

Means and Standard Deviations for All Predicted Variables of Random Sample 1

Variable	M	SD
P1	6.51	2.41
P2	5.37	2.08
P3	5.90	2.48
P4	5.16	2.26
P5	5.83	2.32
P6	5.93	2.20
P7	5.77	2.32
P8	6.37	2.41
P9	5.37	2.23
P10	5.07	2.50
P11	5.11	2.20
P12	5.27	2.30
P13	5.77	2.54
P14	5.63	2.51
P15	5.92	2.38
P16	5.67	2.37
P17	5.79	2.42
P18	5.58	2.21
P19	4.53	2.36
P20	5.33	2.18
P21	5.51	2.19

Note *$p < .05$, **$p < .01$. Left column variables = obtained scores. P1 = predicted Warmth (A) scores, P2 = predicted Reasoning (B) scores, P3 = predicted Emotional Stability (C) scores, P4 = predicted Dominance (E) scores, P5 = predicted Liveliness scores, P6 = predicted Rule-Consciousness (G) scores, P7 = predicted Social Boldness

(H) scores, P8 = predicted Sensitivity (I) scores, P9 = predicted Suspiciousness (L) scores, P10 = predicted Abstractness (M) scores, P11 = predicted Privateness (N) scores, P12 = predicted Apprehension (O) scores, P13 = predicted Openness to Change (Q1) scores, P14 = predicted Self-Reliance (Q2) scores, P15 = predicted Perfectionism (Q3) scores, P16 = predicted Tension (Q4) scores, P17 = predicted Extraversion Global (EX) scores, P18 = predicted Anxiety Global (AX) scores, P19 = predicted Tough-Mindedness Global (TM) scores, P20 = predicted Independence Global (IN) scores, P21 = predicted Self-Control Global (SC) scores

Table 6

Means, Standard Deviations, and Correlations for All Obtained Score Variables of Random Sample 2

Variable	M	SD	P1	P2	P3	P4
1. Warmth (A)	5.65	1.77	.119	-	-	-
2. Reasoning (B)	5.57	1.76	-	-.064	-	-
3. Emotional Stability (C)	5.01	1.52	-	-	.165*	-
4. Dominance (E)	5.13	1.60	-	-	-	.229**

	M	SD	P5	P6	P7	P8
5. Liveliness (F)	6.02	1.68	.271**	-	-	-
6. Rule-Consciousness (G)	4.83	1.65	-	.257**	-	-
7. Social Boldness (H)	5.63	1.88	-	-	.392**	-
8. Sensitivity (I)	5.65	1.86	-	-	-	.205*

	M	SD	P9	P10	P11	P12
9. Suspiciousness (L)	6.21	1.82	.127	-	-	-
10. Abstractness (M)	5.74	1.61	-	.326**	-	-
11. Privateness (N)	5.56	1.70	-	-	.337**	-
12. Apprehension (O)	5.85	1.63	-	-	-	.277**

	M	SD	P13	P14	P15	P16
13. Openness to Change (Q1)	5.63	1.57	.210**	-	-	-

65

	M	SD	P13	P14	P15	P16
14. Self-Reliance (Q2)	5.73	1.69	-	.333**	-	-
15. Perfectionism (Q3)	5.53	1.53	-	-	.335**	-
16. Tension (Q4)	5.53	1.36	-	-	-	.220**

	M	SD	P17	P18	P19	P20
17. Extraversion Global (EX)	5.65	1.77	.404**	-	-	-
18. Anxiety Global (AX)	6.00	1.63	-	.137	-	-
19. Tough-Mindedness Global (TM)	5.31	1.61	-	-	.074	-
20. Independence Global (IN)	5.51	1.52	-	-	-	.115

	M	SD	P21
21. Self-Control Global (SC)	5.00	1.42	.142

Note $*p < .05$, $**p < .01$. Left column variables = obtained scores. P1 = predicted Warmth (A) scores, P2 = predicted Reasoning (B) scores, P3 = predicted Emotional Stability (C) scores, P4 = predicted Dominance (E) scores, P5 = predicted Liveliness (F) scores, P6 = predicted Rule-Consciousness (G) scores, P7 = predicted Social Boldness (H) scores, P8 = predicted Sensitivity (I) scores, P9 = predicted Suspiciousness (L) scores, P10 = predicted Abstractness (M) scores, P11 = predicted Privateness (N) scores, P12 = predicted Apprehension (O) scores, P13 = predicted Openness to Change (Q1) scores, P14 = predicted Self-Reliance (Q2) scores, P15 = predicted Perfectionism (Q3) scores, P16 = predicted Tension (Q4) scores, P17 = predicted Extraversion Global (EX) scores, P18 = predicted Anxiety Global (AX) scores, P19 = predicted Tough-Mindedness Global (TM) scores, P20 = predicted Independence Global (IN) scores, P21 = predicted Self-Control Global (SC) scores

Table 7

Means and Standard Deviations for All Predicted Variables of Random Sample 2

Variable	M	SD
P1	6.69	2.44
P2	5.25	2.14
P3	6.50	2.53
P4	5.22	2.35
P5	5.65	2.52
P6	6.03	2.16
P7	6.07	2.29
P8	6.46	2.50
P9	5.39	2.36
P10	4.87	2.33
P11	5.24	2.28
P12	5.19	2.25
P13	5.91	2.47
P14	6.17	2.52
P15	6.23	2.44
P16	5.63	2.42
P17	6.17	2.46
P18	5.53	2.43
P19	4.25	2.35
P20	5.43	2.22
P21	6.09	2.16

Note $*p < .05$, $**p < .01$. Left column variables = obtained scores. P1 = predicted Warmth (A) scores, P2 = predicted Reasoning (B) scores, P3 = predicted Emotional Stability (C) scores, P4 = predicted Dominance (E) scores, P5 = predicted Liveliness (F) scores, P6 = predicted Rule-Consciousness (G) scores, P7 = predicted Social

Boldness (H) scores, P8 = predicted Sensitivity (I) scores, P9 = predicted Suspiciousness (L) scores, P10 = predicted Abstractness (M) scores, P11 = predicted Privateness (N) scores, P12 = predicted Apprehension (O) scores, P13 = predicted Openness to Change (Q1) scores, P14 = predicted Self-Reliance (Q2) scores, P15 = predicted Perfectionism (Q3) scores, P16 = predicted Tension (Q4) scores, P17 = predicted Extraversion Global (EX) scores, P18 = predicted Anxiety Global (AX) scores, P19 = predicted Tough-Mindedness Global (TM) scores, P20 = predicted Independence Global (IN) scores, P21 = predicted Self-Control Global (SC) scores

Table 8

Means, Standard Deviations, and Correlations for All Obtained Score Variables of Random Sample 3

Variable	*M*	*SD*	P1	P2	P3	P4
1. Warmth (A)	5.55	2.00	.199*	-	-	-
2. Reasoning (B)	5.75	1.69	-	.109	-	-
3. Emotional Stability (C)	4.89	1.55	-	-	.231**	-
4. Dominance (E)	5.01	1.64	-	-	-	.254**
	M	*SD*	P5	P6	P7	P8
5. Liveliness (F)	5.97	1.81	.260**	-	-	-
6. Rule-Consciousness (G)	4.80	1.49	-	.129	-	-
7. Social Boldness (H)	5.33	1.85	-	-	.373**	-
8. Sensitivity (I)	5.59	1.82	-	-	-	.133
	M	*SD*	P9	P10	P11	P12
9. Suspiciousness (L)	6.08	1.73	.111	-	-	-
10. Abstractness (M)	5.72	1.66	-	.083	-	-
11. Privateness (N)	5.76	1.81	-	-	.174*	-
12. Apprehension (O)	6.07	1.52	-	-	-	.140
	M	*SD*	P13	P14	P15	P16
13. Openness to Change (Q1)	5.79	1.91	.165*	-	-	-
14. Self-Reliance (Q2)	6.00	1.74	-	.276**	-	-
15. Perfectionism (Q3)	5.47	1.62	-	-	.246**	-
16. Tension (Q4)	5.69	1.47	-	-	-	.164*

	M	SD	P17	P18	P19	P20
17. Extraversion Global (EX)	5.40	1.87	.425**	-	-	-
18. Anxiety Global (AX)	6.16	1.55	-	.225**	-	-
19. Tough-Mindedness Global (TM)	5.28	1.79	-	-	.133	-
20. Independence Global (IN)	5.36	1.58	-	-	-	.138

	M	SD	P21
21. Self-Control Global (SC)	5.00	1.32	.208*

Note *p < .05, **p < .01. Left column variables = obtained scores. P1 = predicted Warmth (A) scores, P2 = predicted Reasoning (B) scores, P3 = predicted Emotional Stability (C) scores, P4 = predicted Dominance (E) scores, P5 = predicted Liveliness (F) scores, P6 = predicted Rule-Consciousness (G) scores, P7 = predicted Social Boldness (H) scores, P8 = predicted Sensitivity (I) scores, P9 = predicted Suspiciousness (L) scores, P10 = predicted Abstractness (M) scores, P11 = predicted Privateness (N) scores, P12 = predicted Apprehension (O) scores, P13 = predicted Openness to Change (Q1) scores, P14 = predicted Self-Reliance (Q2) scores, P15 = predicted Perfectionism (Q3) scores, P16 = predicted Tension (Q4) scores, P17 = predicted Extraversion Global (EX) scores, P18 = predicted Anxiety Global (AX) scores, P19 = predicted Tough-Mindedness Global (TM) scores, P20 = predicted Independence Global (IN) scores, P21 = predicted Self-Control Global (SC) scores

Table 9

Means, Standard Deviations, and Correlations for All Predicted Variables of Random Sample 3

Variable	M	SD
P1	6.74	2.31
P2	5.31	2.16
P3	6.28	2.59
P4	4.82	2.18
P5	5.52	2.29
P6	6.04	2.33
P7	5.75	2.35
P8	6.35	2.26
P9	4.83	2.15
P10	4.93	2.23
P11	5.15	2.30
P12	5.13	2.34
P13	5.45	2.37
P14	5.64	2.48
P15	6.09	2.44
P16	5.55	2.34
P17	5.89	2.53
P18	5.40	2.31
P19	4.52	2.38
P20	5.28	2.17
P21	5.58	2.19

Note $*p < .05$, $**p < .01$. Left column variables = obtained scores. P1 = predicted Warmth (A) scores, P2 = predicted Reasoning (B) scores, P3 = predicted Emotional Stability (C) scores, P4 = predicted Dominance (E) scores, P5 = predicted Liveliness (F)

scores, P6 = predicted Rule-Consciousness (G) scores, P7 = predicted Social Boldness (H) scores, P8 = predicted Sensitivity (I) scores, P9 = predicted Suspiciousness (L) scores, P10 = predicted Abstractness (M) scores, P11 = predicted Privateness (N) scores, P12 = predicted Apprehension (O) scores, P13 = predicted Openness to Change (Q1) scores, P14 = predicted Self-Reliance (Q2) scores, P15 = predicted Perfectionism (Q3) scores, P16 = predicted Tension (Q4) scores, P17 = predicted Extraversion Global (EX) scores, P18 = predicted Anxiety Global (AX) scores, P19 = predicted Tough-Mindedness Global (TM) scores, P20 = predicted Independence Global (IN) scores, P21 = predicted Self-Control Global (SC) scores

Table 10

Means, Standard Deviations, and Correlations for All Obtained Score Variables of Random Sample 4

Variable	M	SD	P1	P2	P3	P4
1. Warmth (A)	5.50	1.95	.188*	-	-	-
2. Reasoning (B)	5.71	2.00	-	.158	-	-
3. Emotional Stability (C)	4.87	1.64	-	-	.297**	-
4. Dominance (E)	5.14	1.62	-	-	-	.116

	M	SD	P5	P6	P7	P8
5. Liveliness (F)	6.08	1.70	.338**	-	-	-
6. Rule-Consciousness (G)	4.93	1.60	-	.132	-	-
7. Social Boldness (H)	5.34	1.84	-	-	.433**	-
8. Sensitivity (I)	5.58	1.88	-	-	-	.244 **

	M	SD	P9	P10	P11	P12
9. Suspiciousness (L)	6.22	1.88	.083	-	-	-
10. Abstractness (M)	5.97	1.65	-	.260 **	-	-
11. Privateness (N)	5.43	2.03	-	-	.291**	-
12. Apprehension (O)	6.04	1.65	-	-	-	.327* *

	M	SD	P13	P14	P15	P16
13. Openness to Change (Q1)	5.79	1.76	.315**	-	-	-

14. Self-Reliance (Q2)	6.05	1.74	-	.325**	-	-
15. Perfectionism (Q3)	5.60	1.70	-	-	.337**	-
16. Tension (Q4)	5.83	1.55	-	-	-	.110

	M	*SD*	P17	P18	P19	P20
17. Extraversion Global (EX)	5.52	1.88	.397**	-	-	-
18. Anxiety Global (AX)	6.27	1.65	-	.178*	-	-
19. Tough-Mindedness Global (TM)	5.22	1.77	-	-	.247**	-
20. Independence Global (IN)	5.48	1.47	-	-	-	.086

	M	*SD*	P21
21. Self-Control Global (SC)	5.00	1.38	.147

Note $*p < .05$, $**p < .01$. Left column variables = obtained scores. P1 = predicted Warmth (A) scores, P2 = predicted Reasoning (B) scores, P3 = predicted Emotional Stability (C) scores, P4 = predicted Dominance (E) scores, P5 = predicted Liveliness (F) scores, P6 = predicted Rule-Consciousness (G) scores, P7 = predicted Social Boldness (H) scores, P8 = predicted Sensitivity (I) scores, P9 = predicted Suspiciousness (L) scores, P10 = predicted Abstractness (M) scores, P11 = predicted Privateness (N) scores, P12 = predicted Apprehension (O) scores, P13 = predicted Openness to Change (Q1) scores, P14 = predicted Self-Reliance (Q2) scores, P15 = predicted Perfectionism (Q3) scores, P16 = predicted Tension (Q4) scores, P17 = predicted Extraversion Global (EX) scores, P18 = predicted Anxiety Global (AX) scores, P19 = predicted Tough-Mindedness Global (TM) scores, P20 = predicted Independence Global (IN) scores, P21 = predicted Self-Control Global (SC) scores

Table 11

Means and Standard Deviations for All Predicted Variables of Random Sample 4

Variable	M	SD
P1	6.62	2.35
P2	5.37	2.20
P3	6.23	2.43
P4	5.31	2.17
P5	5.87	2.28
P6	6.05	2.22
P7	5.83	2.20
P8	6.00	2.43
P9	5.12	2.30
P10	5.20	2.40
P11	5.07	2.31
P12	4.95	2.25
P13	5.92	2.35
P14	6.08	2.31
P15	6.13	2.50
P16	5.77	2.30
P17	5.94	2.44
P18	5.52	2.32
P19	4.36	2.29
P20	5.86	2.10
P21	5.56	2.16

Note $*p < .05$, $**p < .01$. Left column variables = obtained scores. P1 = predicted Warmth (A) scores, P2 = predicted Reasoning (B) scores, P3 = predicted Emotional Stability (C) scores, P4 = predicted Dominance (E) scores, P5 = predicted Liveliness (F) scores, P6 = predicted Rule-Consciousness (G) scores, P7 = predicted Social Boldness

(H) scores, P8 = predicted Sensitivity (I) scores, P9 = predicted Suspiciousness (L) scores, P10 = predicted Abstractness (M) scores, P11 = predicted Privateness (N) scores, P12 = predicted Apprehension (O) scores, P13 = predicted Openness to Change (Q1) scores, P14 = predicted Self-Reliance (Q2) scores, P15 = predicted Perfectionism (Q3) scores, P16 = predicted Tension (Q4) scores, P17 = predicted Extraversion Global (EX) scores, P18 = predicted Anxiety Global (AX) scores, P19 = predicted Tough-Mindedness Global (TM) scores, P20 = predicted Independence Global (IN) scores, P21 = predicted Self-Control Global (SC) scores

Appendix

16PF Blank Record Form

16PF® Fifth Edition Individual Record Form
Profile Sheet

Name

Date

IPAT

Instructions: Write the sten score for each factor in the second column. Starting with Factor A, place a mark over the spot representing the appropriate sten score. Repeat for each factor. Connect the marks with straight lines.

PRIMARY FACTORS

Factor	Sten	Left Meaning	Standard Ten Score (STEN)	Right Meaning
A: Warmth		Reserved, Impersonal, Distant		Warm, Outgoing, Attentive to Others
B: Reasoning		Concrete		Abstract
C: Emotional Stability		Reactive, Emotionally Changeable		Emotionally Stable, Adaptive, Mature
E: Dominance		Deferential, Cooperative, Avoids Conflict		Dominant, Forceful, Assertive
F: Liveliness		Serious, Restrained, Careful		Lively, Animated, Spontaneous
G: Rule-Consciousness		Expedient, Nonconforming		Rule-Conscious, Dutiful
H: Social Boldness		Shy, Threat-Sensitive, Timid		Socially Bold, Venturesome, Thick-Skinned
I: Sensitivity		Utilitarian, Objective, Unsentimental		Sensitive, Aesthetic, Sentimental
L: Vigilance		Trusting, Unsuspecting, Accepting		Vigilant, Suspicious, Skeptical, Wary
M: Abstractedness		Grounded, Practical, Solution-Oriented		Abstracted, Imaginative, Idea-Oriented
N: Privateness		Forthright, Genuine, Artless		Private, Discreet, Non-Disclosing
O: Apprehension		Self-Assured, Unworried, Complacent		Apprehensive, Self-Doubting, Worried
Q₁: Openness to Change		Traditional, Attached to Familiar		Open to Change, Experimenting
Q₂: Self-Reliance		Group-Oriented, Affiliative		Self-Reliant, Solitary, Individualistic
Q₃: Perfectionism		Tolerates Disorder, Unexacting, Flexible		Perfectionistic, Organized, Self-Disciplined
Q₄: Tension		Relaxed, Placid, Patient		Tense, High Energy, Impatient, Driven

Standard Ten Score (STEN) columns: 1 2 3 4 5 6 7 8 9 10 (Average)

GLOBAL FACTORS

	Left Meaning	1 2 3 4 5 6 7 8 9 10 (Average)	Right Meaning
EX: Extraversion	Introverted, Socially Inhibited		Extraverted, Socially Participating
AX: Anxiety	Low Anxiety, Unperturbed		High Anxiety, Perturbable
TM: Tough-Mindedness	Receptive, Open-Minded, Intuitive		Tough-Minded, Resolute, Unempathic
IN: Independence	Accommodating, Agreeable, Selfless		Independent, Persuasive, Willful
SC: Self-Control	Unrestrained, Follows Urges		Self-Controlled, Inhibits Urges