

An Examination of the Degree of Self-Knowledge Across Baby Boomers,
Generation Xers, and Millennials

By

Jenna Marie Manelli

Bachelor of Arts
Psychology
Mass/Media Communication Studies
Florida State University
2014

Master of Science
Psychology
Florida Institute of Technology
2017

A Doctoral Research Project submitted to the
School of Psychology at
Florida Institute of Technology
in partial fulfillment of the requirements
for the degree of

Doctor of Psychology
In
Clinical Psychology

Melbourne, Florida
December 2018

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We the undersigned committee hereby approve the attached doctoral level project,
“An Examination of the Degree of Self-Knowledge Across Baby Boomers,
Generation Xers, and Millennials”
by Jenna Marie Manelli, M.S.

Richard Elmore Jr., Ph.D.
Associate Professor
College of Psychology and Liberal Arts
Committee Chair

Victoria Follette, Ph.D.
Clinical Psychology Psy.D. Program
Chair
College of Psychology and Liberal Arts
Committee Member

John Frongillo, Ph.D.
Assistant Professor
College of Psychology and Liberal Arts
Committee Member

Lisa Steelman, Ph.D.
Professor, Dean
College of Psychology and Liberal Arts

Abstract

TITLE: An Examination of the Degree of Self-Knowledge Across Baby Boomers, Generation Xers, and Millennials

AUTHOR: Jenna Manelli, M.S.

MAJOR ADVISOR: Richard Elmore Jr., Ph.D.

Generations and their differences, as well as the construct of self-knowledge, have been studied at length due to their potential predictive power over an individual's behaviors. This research proposes to build upon these constructs by blending them together in order to see the differences that exist on various personality dimensions, as well as on self-knowledge, between the Baby Boomer, Generation X, and Millennial generations. In order to test these hypotheses, archival data were used. Participants in the archival data set were grouped based on their generation depending on the year of their birth. The federal government, specifically the U.S. Census Bureau, defines the generational cutoffs. The Baby Boomers include those individuals who were born between 1946 and 1964. Generation X includes people born from 1965 to 1980, and the Millennial generation includes those born from 1980-2000. Statistical analyses will be run in order to compare the mean SAPP scores of each generational cohort in order to test which group as a whole had the most accurate perception of self-knowledge. Additionally, mean SAPP scores of those with different levels of education in the Baby Boomer generation will be compared statistically in order to test if higher educated Baby Boomers have more

accurate personality prediction. Additional hypotheses, in order to further explore the variables, will also be tested.

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Acknowledgements

They say it takes a village, and I concur that I could not have achieved this milestone without the team of wonderful people I am immeasurably blessed to have in my life. First and foremost, I would like to thank Dr. Farber the original mastermind behind the formation of the SAPP. Your guidance throughout my time at Florida Tech has helped me gain insight and confidence. I will always treasure your support, wisdom, and most importantly, jokes. Next, I would like to thank Dr. Elmore who graciously took me under his wing and saw me through to the end of this project. Your job was not an easy one, but you never stopped believing in me, which encouraged me to believe in myself. I would also like to thank Dr. Follette and Dr. Frongillo who took the time to be on my committee. Your support and feedback have helped me to grow, both professionally and personally. To Nicole- my stats tutor, mentor, and roommate- I am endlessly thankful for the countless hours you spent assisting me on my journey. You kept me grounded, cheered me on, and somehow, remained my friend through it all. To Callie- you kept me sane, laughing, and loving even through the lowest of lows, and for that, I am forever grateful. Lastly, I must thank my parents and sister who have never given up faith in me. I hope to continue making you guys proud. Thank you again to my village- I could never have done this without each and every one of you.

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Literature Review

Generational Cohorts

It has been determined that humans have a natural tendency to categorize information in an effort to make sense of the infinite stream of stimuli we are inundated with on a daily basis. Humans are predisposed to group others by race, ethnicity, gender, socioeconomic status, and age. One of the primary ways people are categorized is by generational cohort, which can be defined as a group of individuals born during the same time period who experienced similar cultural contexts (Campbell, Campbell, Siedor, & Twenge, 2015). Humans have been influenced by a number of historical events, and consequently, people from different generational cohorts experience these same events at different ages. Research has suggested that such events affect children, adolescents, and adults distinctively, and thus may be a significant factor that contributes to disparities between birth cohorts. Studies have found birth cohort effects on various variables, including conflict management, leadership styles, consumer preferences, and personality characteristics (Messarra, Karkoulian, & El-Kassar, 2016; Sessa, Kabacoff, Deal, & Brown, 2007; Loroz & Helgeson, 2013; Wong, Gardiner, Lang, & Coulon, 2008). The next section will briefly describe the Baby Boomer,

Generation X, and Millennial generations, and examine the unique factors that account for differences amongst these cohorts.

Baby Boomers

The Baby Boomer cohort consists of those individuals who were born during the post World War II “baby boom” in the United States from 1949 to 1964 (Colby & Ortman, 2014). Baby Boomers began turning 65 in 2011, and by 2029, all members of the cohort will be 65 years and over, making up more than 20 percent of the US population. Projections show that by 2056, the population of 65-year-olds and older will be larger than the population of those under 18-years-old (Colby & Ortman, 2014).

Baby Boomers have experienced many social and cultural changes throughout their lives. Members of the Baby Boomer generation came of age during the 1960s and 1970s; thus, they were heavily shaped by monumental events in history including the Vietnam War, the civil rights movements, the Kennedy and King assassinations, Watergate, the moon landing, the sexual revolution, and Woodstock (Sessa, Kabacoff, Deal, & Brown, 2007). They grew up in mostly traditional families and were raised to be independent, learning that one’s future was determined by one’s own control. The Baby Boomer cohort grew up witnessing the shortcomings of political, religious, and business leaders, which led to a lack of respect and trust towards institutions of authority. While they adamantly protested supremacy in their youth, they now hold positions of corporate

and national power, and because of the Reagan administration's conservative policies, material success and the trend towards traditional values returned to prominence (Sessa, Kabacoff, Deal, & Brown, 2007). Baby Boomers have been typified as generally optimistic, ambitious, idealistic, and hardworking, and existing research supports the notion that they value teamwork and a stable working environment (Wong, Gardiner, Lang, & Coulon, 2008).

Generation X

Members of Generation X were born from 1965 to 1981, thus their formative years were spent during the 1980s through the early 1990s (Gardiner, Grace, & King, 2013). Unlike former generations, Generation X experienced the breakdown of the traditional family, characterized by rising divorce rates and women's participation in the workforces, thus individuals were more likely to be raised by a single parent or by two working parents. Generation X was the first cohort to encounter the radical change in the workplace brought on by the technological revolution. Gen-Xers witnessed several crises, characterized by economic recessions, inflation, oil shortages, and terrorist attacks. They have been shaped by societal insecurity, rapid changes, increased diversity, and a lack of solid traditions. Stereotypes associated with Generation X include skepticism, cynicism, pessimism, and distrust; however, not all traits are unfavorable (Wong, Gardiner, Lang, & Coulon, 2008). Research suggests that Gen-Xers are likely to be ambitious, determined to succeed, and more comfortable with change. Their diverse makeup

suggests they are better capable of tolerating, and even embracing, differences among others (Sessa, Kabacoff, Deal, & Brown, 2007).

Millennials

Millennials, also known as Generation Y, the Internet Generation, the Nexters, and the Echo Boomers, were born from 1982 to 2000 (Aydogmus, 2016). It should be noted, however, that some literature marks 1981, or prior years, as the start of the cohort (Wong, Gardiner, Lang, & Coulon, 2008; Messarra, Karkoulian, & El-Kassar, 2016). Millennials have witnessed terrorism like no other generation, including intracountry violence, in addition to foreign attacks. Fluctuations in the economy have led to seemingly permanent feelings of financial insecurity, which has been coupled with a rising rate of poverty among the young. Racial and ethnic diversity is greatest within this generation, and thus, individual differences are more accepted. They are characterized as the first high-tech generation, thrust into a world of 24-hour connectedness. Ever-present technology has influenced Millennials' expectations. They are prone to anticipate instant gratification, which relates to a sense of entitlement and possible egocentrism. Quick fixes and easy solutions decrease the need to practice patience, which may engender feelings of discomfort when faced with matters involving reflection and perseverance. Research shows that Millennials are more likely than those of previous generations to avoid complexity in gathering and processing information in shaping their perception, judgment, and learning (Giambatista, Hoover, & Tribble, 2017). -

Therefore, this may have stunted their development in acquiring skills necessary for digging out information that can lead to enhanced perspectives. More favorable descriptors associated with Millennials are higher levels of self-esteem, assertiveness, and acceptance of others (Trapero, Castaño, Parra, & García, 2017).

Differences Among Generations

It is widely accepted that the social context in which a generational group develops influences their personality, values, beliefs, and feelings towards others. Much research has highlighted these differences in order to better understand societal, workplace, and consumer roles. The following studies examine the effects of a generational cohort on an individual.

A study conducted by Messarra, Karkoulian, and El-Kassar (2016) tested whether Generation X (born 1965-1980) and Generation Y (born 1981-2000), as separate cohorts, moderate the relationship between conflict handling style and personality. Participants' conflict resolution styles included dominating style, integrating style, avoiding style, obliging style, and compromising style, and were measured using the Rahim Organizational Conflict Inventory-II. The personality traits examined in the study included openness, conscientiousness, extraversion, agreeableness, and emotional stability, which were measured using the NEO Personality Inventory and NEO Five-Factor Inventory. Results revealed that Generations X and Y moderated the relationship between the integrating conflict style and extraversion; the compromising conflict style and conscientiousness; and

the avoiding style and conscientiousness, extraversion, and agreeableness. For each relationship, Generation X had a greater moderating effect than Y. Results suggest that Gen-Xers, compared to Gen Ys, are more flexible, loyal, and at ease with their surroundings, which indicate a higher level of extraversion. Additionally, Gen-Xers are more self-controlled, responsible, and dutiful, suggesting a higher degree of conscientiousness. Lastly, Gen-Xers are more likely to behave in harmony with others' interests, which is a feature associated with agreeableness (Messarra, Karkoulian, & El-Kassar, 2016).

Sessa, Kabacoff, Deal, and Brown (2007) examined the differences in attitudes, values, and beliefs across generational cohorts, and whether the differences affect leadership values and behaviors. The sample size consisted of 447 working Americans (34 Matures, 95 Early Baby Boomers, 114 Late Baby Boomers, 138 Early Gen-Xers, 15 Late Gen-Xers, and 51 Millennials) who completed a survey consisting of a variety of questions pertaining to lifestyle, work patterns, and leadership attributes. Measures used in the study included the participants' birth year and the Leadership Descriptives Sort, which allows participants to choose among 40 leadership attributes and rank-order the 8 to 12 traits they deem most important. Results indicated that 6 of the 12 attributes, including credible, listens well, farsighted, focused, dedicated, and optimistic, were significantly different across generational cohorts. Overall, both Early and Late Baby Boomers valued attributes associated with trustworthiness, experience, and a

big-picture orientation. Gen-Xers were shown to also prefer a trustworthy and experienced leader, who is also optimistic and encouraging. Similarly, Millennials valued trustworthiness, though not as highly as other cohorts. Results revealed that Millennials differed from other groups in higher values in dedication, focus, and optimism, along with lower values in credibility and farsightedness (Sessa, Kabacoff, Deal, & Brown, 2007).

Wong, Gardiner, Lang, and Coulon (2008) sought to examine whether differences in personality and motivational drive exist among three generations of working Australians: Baby Boomers, Generation X, and Generation Y. The importance of understanding personality differences across generations is highlighted by the notion that an individual's personality may affect job performance and satisfaction. In order to maintain a successful and content workforce, companies must understand the generational differences across personality preferences. Two self-report measures, including the Occupational Personality Questionnaire (OPQ32) and the Motivation Questionnaire (MQ), were completed by Baby Boomer (N=1,005 for OPQ; 110 for MQ), Generation X (N=2,089 for OPQ; 140 for MQ), and Generation Y (N=441 for OPQ; 44 for MQ) employees. When comparing personality traits, results indicated that there was a significant difference between groups on the achieving trait, as both Gen-Xers and Gen Ys were more ambitious and career-centered than Baby Boomers. Additional differences in personality traits indicate that Baby Boomers rated themselves as

significantly more optimistic than Gen Ys; however, Gen Ys were found to be more conscientious than Gen-Xers, as well as more affiliative than both Gen-Xers and Baby Boomers. Similarly, significant differences in motivational drivers were found amongst generations. Gen-Xers and Gen Ys were shown to be more motivated by progression than Baby Boomers. Gen Ys were shown to be more motivated by an affiliative workplace than Baby Boomers, and less motivated by power than Gen-Xers, who are in turn less motivated than Baby Boomers. Different life stages may also serve as a plausible explanation for some differences noted; for instance, Gen Ys, being as they are beginning to establish themselves in the workforce, may be more affiliative than Baby Boomers who are likely to be in senior positions that require more independent work (Wong, Gardiner, Lang, & Coulon, 2008).

Loroz and Helgeson (2013) sought to examine the differences between 165 Baby Boomer parents and 123 Generation Y children based on a survey completed to measure their consumer values and personality traits. Researchers found that Gen Ys scored significantly higher in their degree of materialism when compared to Baby Boomers, while Baby Boomers scored significantly higher in terms of religiosity than Gen Ys. Furthermore, Generation Y participants displayed higher levels of self-monitoring than Baby Boomers, specifically on their ability to monitor self-presentation. However, when it came to personality traits such as

dispositional guilt and empathic concern, Baby Boomers reported higher levels of both when compared to their Generation Y counterparts (Loroz & Helgeson, 2013).

For the second part of their study, Loroz and Helgeson (2013) examined the effectiveness of various advertising appeals across the two groups, in order to build on what was found in their first study. The participants for this study included 352 Baby Boomers and 272 Gen Ys. The survey included various advertisements and asked the participants to rank various factors on a Likert scale that evaluated each of the advertisements. The researchers found that while aspects of the items advertised had no intergenerational differences in terms of functionality or economical appeal, those from Gen Ys had much more positive attitudes towards the image and extravagance appeals of products featured. Additionally, Generation Y participants had a much more positive attitude to products that featured sex appeal and greed appeal than did Baby Boomers, though there were no significant intergenerational differences between romance appeals. Overall, based on the study, it appears that Generation Y are more subject to high levels of peer influence and seek affirmation from the group, while Baby Boomers are more likely to engage in charitable contributions to the community and social responsibility (Loroz & Helgeson, 2013).

A study conducted by Trapero, Castaño, Parra, and García (2017) sought to compare the differences in self-perception of organizational pride and loyalty between Millennials and Generation X, while also taking into account gender and

seniority within the company. Participants included 432 employees working in a group of companies in northeastern Mexico. Participants completed a questionnaire in which they rated items pertaining to organizational pride and loyalty on a scale from 1 to 5, with 5 being the highest. An ANOVA was used to compare differences in group scores. Results showed no significant differences between male and female Millennials with or without seniority, female Millennials and Gen-Xers with or without seniority, or male Millennials and Gen-Xers with seniority; however, significant differences were found amongst male Millennials and Gen-Xers with little seniority in the sense of loyalty, but not pride (Trapero, Castaño, Parra, & García, 2017).

Ordun and Akun's (2016) study examined the relations between personality characteristics and emotional intelligence of 237 Turkish Millennials using the Big Five Personality Inventory (IPIP-NEO) and the Wong and Law Emotional Intelligence Scale (WLEIS). The IPIP-NEO consists of 5 domains, Neuroticism, Extraversion, Openness to experience, Agreeableness, and Conscientiousness. The WLEIS measure has 4 dimensions of emotional intelligence, including emotional appraisal dimension, others' emotional appraisal, regulation of emotions, and use of emotions. In this research, openness has the highest and neuroticism has the lowest mean score among Millennials. Additionally, self-emotional appraisal and other emotional appraisal have the highest mean scores, while the lowest mean score that Millennials ranked themselves among all dimensions is the regulation of emotions.

Examination of the correlation results between personality characteristics and emotional intelligence dimension reveal several significant associations.

Extraversion and openness have positive significant effects on self-emotional appraisal, suggesting that those who are more familiar in social situations and those more interested and open to different experiences and ideas are likely to realize their emotions much more. Moreover, neuroticism, extraversion, and conscientiousness have significant effects on emotional appraisal. It is understandable that those who are more neurotic and prone to worry would be more sensitive to social cues like others' emotional appraisal, though perceptions of appraisal are likely negative. Similarly, extraverted people, and conscientiousness people, who give importance to integrity and discipline, are likely to be more sensitive to the emotions of others. Furthermore, neuroticism and agreeableness have significant effects on regulation of emotions. Neurotics, who may be bad-tempered and easily overwhelmed, are less likely to control emotions and cope rationally, while agreeable individuals who appreciate cooperation, are likely to better control their emotions and remain calm across situations. Lastly, extraversion, agreeableness, and conscientiousness have significant effects on use of emotions. People with these traits are likely to do what is best in achieving their own goals, and may also strive to aid others in accomplishing their goals (Ordun & Akun, 2016).

The Self

The relevance and importance of the “self” in understanding human behavior has been long discussed throughout history. One may think that a concept which has been in existence for so long would be easily defined and explained; however, much like the complexity of one’s “self,” psychologists and sociologists alike have faced difficulty in agreeing upon one definition that encapsulates each distinct element of the term. Kihlstrom and Klein (1997) sought to answer the question, “What does the self look like?” and they suggested that cognitive psychology can provide four potential answers to this question: The self can be viewed as a concept, a story, an image, or an associative network. When viewed as a concept, the self is an uncertain set of context-specific selves, possibly joined together by a characteristic self, or by an encompassing theory of why one person can be viewed one way in certain situations, and another person differently in within the same situations. As a story, the self is seen as a narrative, or a group of narratives, which have been formed, rehearsed, and related to others. When viewed as an image, the self is a perceived object, as it exists in the mind of the one perceiving it, which stores knowledge about both spatial relationships and visual details about physical appearances and gestures. Lastly, when viewed as an associative network, the self can be seen as a group of concepts regarding abstract traits, and one’s unique experiences, thoughts, and behaviors, in which semantic

self-knowledge becomes independent of episodic self-knowledge (Kihlstrom & Klein, 1997).

Leary and Tangney (2012) identified five discrete ways in which behavioral and social scientists use the word “self” and its compounds. First, the self can be viewed as the “self as the total person”, suggesting that one’s “self” is simply that person, him- or herself. The problem with this usage is that the term self becomes synonymous with the entirety of the person, and thus loses any independent meaning. From a psychological perspective, one does not see the person *as* a “self,” but rather that each person *has* a “self.” The second general way the self has been defined and used is to essentially use the “self” to reference all or part of a person’s personality. Using the two words as having equitable meaning shares the same dilemma as equating the self with the entirety of the person. Both suffer from a duplicity of terms that renders one of the two terms unnecessary. Most psychologists and philosophers would argue that although the self is certainly relevant to understanding aspects of one’s personality, the construct of personality is only one of several distinctive facets of self.

The third view of the self is the “self as the experiencing subject.” The self as subject, or “the self as knower,” is the psychological process that accounts for self-awareness and self-consciousness (Leary & Tangney, 2012). More simply put, this version of self, or the self as “I,” references the inner psychological unit that experiences both the internal and external world; that is the part of a person that

experiences his or her experiences, thinks the thoughts, and feels the feelings.

Generally, the self as “I” is not divisible into any component parts.

In contrast to the “self-as-knower” (I-self), there is the “self-as-known” (Me-self), or “self as beliefs about oneself” (Leary & Tangney, 2012). This refers to the perceptions, thoughts, and feelings about oneself, or rather, the answer one would give to a question such as “Who am I?” The beliefs an individual holds about him- or herself make up only one element of a coherent whole, which is why this “self” is often referred to as “fragmented” (Leary & Tangney, 2012).

Lastly, the fifth conceptualization of the self is the “self as executive agent,” and is also seen as the “decision maker” or “doer” part of the individual. In essence, it is the entity responsible for an individual’s behavior (Leary & Tangney, 2012).

Self-Knowledge

Most people would argue they know themselves better than anyone else knows them; however, peoples’ perceptions of their own personalities often contain important omissions. Regarding the accuracy and bias in self-knowledge, Brown (1991) defined “the self” as a cognitive structure that fuses all the different methods in which a person typically answers the question “Who am I?”. Usually the answers to that question fall into different categories: physical attributes, social identities, and personal identities. Therefore, when people define the self, it often reflects their subjective perceptions of who they are. Existential philosophers encourage the pursuit of self-knowledge because they believe people have an obligation to

understand themselves. Psychology has also encouraged self-understanding, because accurate self-knowledge is essential for effective functioning in the world. However, individuals frequently view their self-perceptions in self-enhancing directions, and consequently have unrealistic positive views of themselves by exaggerating their ability to control events that occur in their environments. They are also overly optimistic about their abilities and futures in ways that are not realistic. In order to support this bias, a number of mechanisms are used, including employing self-enhancing illusions, avoiding negative feedback in order to maintain their illusions, and selectively attending to, interpreting, or remembering feedback. This battle to protect one's self-worth leads, ultimately, to bias and inaccuracy in self-knowledge, and consequently can also lead to problems in individuals' functioning (Brown, 1991).

Self-knowledge is an important facet in many aspects of one's life, particularly with respect to one's effectiveness in interacting interpersonally. It is crucial to become aware of and overcome the informational and motivational barriers people unknowingly utilize to protect their egos. Carlson (2013) examined how mindfulness which involves, among other processes, increasing one's attention and awareness to current experiences in a non-evaluative way, can lead to a more accurate sense of self. Enhancing awareness of emotions and increasing the amount of information of one's thinking patterns and one's knowledge of behavior can lead to better modulation of emotions and behaviors, and thus, improve adaptive

functioning, both intrapersonally and interpersonally (Carlson, 2013). Vogt and Colvin (2005) argued that though accuracy of self-knowledge is an important area of interest due to its potential implications on mental health, there is a great deal of difficulty in assessing it.

It is imperative to also look at accuracy when regarding one's degree of self-knowledge. However, such discussion does not typically include how those personality traits are developed. Do individuals knowingly self-create them, or are they developed over time and then individuals gain awareness and knowledge of them? Much of the previous literature has suggested that personality traits are the sum of one's previous behaviors, the relative success of those behaviors, and how they have been generalized across settings and time. However, Schneider, Roediger, Henry, and Khan (1993) argued that while some of the knowledge individuals have about their own personalities comes from this pathway, it is not the only pathway to gaining self-knowledge. Rather, one's personality traits may in fact be representative of our goals and intentions in life. Consequently, if someone is trying to decide whether or not they are conscientious, the person will look to their goals and aspirations, as opposed to his or her past behaviors (Schneider et al., 1993). This pathway though, is more susceptible to bias than relying on past experiences, because those goals have not yet been achieved. Vazire and Carlson (2011) postulated that people often misperceive some aspects of their personality due to blind spots, which can be simply due to a lack of information, or a

motivation to maintain and enhance our self-worth. Research has shown that some people go to great lengths in order to maintain a positive view of themselves, inadvertently skewing their self-assessment.

In the body of research surrounding self-knowledge, there have been two different pathways discussed for how individuals learn about themselves. One of these pathways is through introspection, where individuals look inward for the answers as to who they are, and the other is through feedback from others about themselves and how they are perceived. Bollich, Johannet, and Vazire (2011) examined these two pathways and their respective potential for improving someone's self-knowledge. They argued that explicit feedback is likely one of the best pathways in order to learn about one's own personality. Introspection, it is argued, is often fraught with biases about one's own abilities and traits. When others, especially those who are close to an individual and are knowledgeable about him or her, give feedback to an individual, though it may be resisted and not well received, it often can provide new insight into blind spots that introspection can miss (Bollich, Johannet, & Vazire, 2011).

Having self-knowledge is generally correlated with having insight, and the ability to assess and know one's abilities. However, research has yet to demonstrate whether an individual's insight into his or her own capabilities is accurate or inaccurate. Zell and Krizan (2014) attempted to study this by examining participant's self-evaluations across domains of ability, such as intelligence and

language competence, and how those corresponded to their scores on objective performance measures. The researchers analyzed 22 meta-analyses, and found that across the study, though the effect sizes were different, there was an overall moderate correlation between the subjects' self-evaluations and their subsequent outcomes on performance measures. The correlation was stronger when the evaluation of the individuals on their own abilities was more specific to a single domain rather than broad, as well as when their performance tasks were familiar to them, more objective in nature, or not very complex. This meta-analysis, therefore, demonstrates that individuals have only a moderate level of insight into their own abilities, and their inaccuracies in self-perception can be accounted for by contextual factors (Zell & Krizan, 2014).

Though individuals' self-perceptions are often biased and faulty, research has yet to explore why judging one's own competence is so difficult. Carter and Dunning (2008), however, argued that self-evaluation is an innately difficult task, and that it contributes to people's inaccurate views of their competence. People live in an environment that prohibits accurate self-evaluation because it does not contain all the necessary information needed to make accurate conclusions. According to the authors, this is due to two primary reasons: the first being that people lack necessary categories of information to make accurate determinations, and secondly, though they receive feedback from others to correct their inaccurate assessments, that feedback is often flawed due to biases or difficulty in

comprehending. Since information people receive is misleading and faulty, naturally, self-assessments would also be faulty since they are based on faulty information, thus making it unreasonable for individuals' self-assessments to be accurate (Carter & Dunning, 2008).

Having flawed self-assessment potentially has impacts far beyond interpersonal relationships, extending also into domains such as health, education, and the workplace. Dunning, Heath, and Suls (2004) examined the effect that inaccurate self-knowledge has on these domains by reviewing the empirical findings to date. In the domain of health, for example, studies have demonstrated that people are unrealistically optimistic about the dangers to their own health compared to those around them. This causes them to overestimate the distinctiveness of their health opinions and preferences, which can lead to adverse health impacts. Additionally, inaccurate self-perceptions can also cause people to misdiagnose themselves, which can also cause health consequences. In the domain of education, students' own assessment of their performance only moderately correlates with the assessments of those students made by their teachers. Students also tend to feel overly confident in skills they just learn, which negatively hampers their ability to comprehend materials they have just read. Additionally, the authors found that inaccuracies in self-perceptions can contribute to over-inflated beliefs in academic skills, which, although promoting self-confidence, do not contribute to the retention of information, and consequently do not promote their learning. The

final domain of workplace applies to both employees and CEOs in companies, with both overestimating their skills and judgment, respectively (Dunning, Heath, & Suls, 2004). Being able to accurately measure self-assessment is therefore increasingly important, because the inaccuracy of self-assessment, if left unmodified, can yield substantial negative effects on health, education, and work.

Scientifically measuring the assumption that one's self-knowledge is a strength has been historically difficult, primarily because measuring individual differences in self-knowledge poses a challenge in and of itself. In a 2013 study by Tenney, Vazire, and Mehl, the researchers used a mixture of naturalistic and objective measure to determine individuals' degree of self-knowledge. In the study, individuals' self-knowledge was determined by comparing their beliefs about how they normally behave and their actual behavior, obtained through audio recordings from daily life. This novel measure of self-knowledge was positively correlated with informants' perceptions of relationship quality. The results from the study indicate that self-knowledge is interpersonally advantageous and may hold crucial social value.

What follows next will first be a review of the various attempts within literature to measure the construct of self-knowledge. Following that review will be a comprehensive look at the background information of a recently developed scale using the Sixteen Personality Factor Questionnaire (16 PF), which presumably

measures the accuracy of one's ability to predict his or her personality traits. The implications of this measure will be of importance to the area of self-knowledge.

Assessment of Self-Knowledge

Adler (2012) argued that because the topic of self-knowledge includes so many facets, and is so important, there is not one method that can be used to accurately assess how self-knowledge is developed. Trying to measure self-knowledge in an objective manner can have numerous obstacles, but relying on biased self-perceptions also contains inherent difficulties. Narrative psychology, however, is argued to bridge the gap between both of these by including the scientific side, which includes validity and reliability facets, as well as embracing the subjectivity of individual's stories. The narrative perspective challenges the scientific model by arguing that the self, and consequently self-knowledge, is internal by its very nature and therefore a subjective phenomenon. Yet, though individuals are treated then as experts on their own lived experiences, a system in which elements of their narrative can be encoded into a more measurable and objective manner could potentially bridge the gap between the paradigmatic method and the narrative one (Adler, 2012).

Vogt and Colvin (2005) put forward a rather sophisticated method to effectively measure participants' accuracy of their self-knowledge that included self-report measures, videotaped dyadic interactions that were later assessed, and observations made by parents, friends, and behavioral coders. Each of the 93

participants completed both the California Adult Q-sort (CAQ), the Revised NEO Personality Inventory (NEO-PI-R), and interacted with two unacquainted same-sex and opposite sex-partners on videotapes. Additionally, two parents/guardians and two friends of each of the participants completed the CAQ and the NEO-PI-R for the participant and the videotaped interactions were coded in regards to behavior using the Behavioral Q-sort (BQ). The results of this study demonstrated that the battery completed by participants, when aggregation of scores occurred, provided psychometric support for its internal consistency reliability and convergent validity in being a procedure for assessing individual differences in the accuracy of self-knowledge (Vogt & Colvin, 2005). The one difficulty with this approach when utilized within a clinical or work setting, is the amount of time and effort that the assessment would require.

The 16-PF, Fifth Edition

The 16PF was first published by Raymond B. Cattell as an objective measure of personality. Since its initial release in 1949, it has been revised four times and is currently in its fifth edition, which was created in 1988. The test contains 185 items, which correspond to 16 primary factors and five global factors of personality (Russell & Karol, 1994). Additionally, the 16PF includes three validity scales, which are used in order to determine the respondent's attitudes towards the test, and to ensure that no random or biased response patterns were used by the examinee (Karson, Karson, & O-Dell, 1997).

The 16 primary personality factors on the 16PF are: Warmth (A), Reasoning (B), Emotional Stability (C), Dominance (E), Liveliness (F), Rule-Consciousness (G), Social Boldness (H), Sensitivity (I), Vigilance (L), Abstractedness (M), Privateness (N), Apprehension (O), Openness to Change (Q1), Self-Reliance (Q2), Perfectionism (Q3), and Tension (Q4) (Karson, Karson, & O'Dell, 1997; Russell & Karol, 1994). The five global factors include Extraversion (EX), Anxiety (AX), Tough-Mindedness (TM), Independence (IN), and Self-Control (SC).

The 16 primary factors are displayed on the respondent's profile sheet so that the scales with the most impact on people's behavior and personality are listed first. These first scales are the ones initially identified through the series of factor analyses. On the profile sheet, examinees see specific descriptors on either side of the ten-point continuum, which describe characteristics of a person who falls on either extreme side of the continuum. The profile sheet that demonstrates this can be found in Appendix A. The following brief interpretations describe each of the 16 personality factors, as well as the five global factors.

The first factor, A, is Warmth. Warmth measures the degree to which an individual is emotionally oriented towards others. High scorers are likely to be more inclined to form close relationships with others and feel more comfortable in said relationships. They are typically viewed as outgoing, supportive, attentive, warm, and are thus, well-liked by others. Dissimilarly, low scorers tend to be more

reserved, distant, and impersonal. They are less likely than high scorers to express concern regarding the implications of their behaviors on others. Factor B, Reasoning, examines an individual's ability to recognize abstract concepts and thinking patterns. It serves as a means of discerning one's primary problem-solving style. High scores on this factor are indicative of individuals who think abstractly, while lower scores suggest the presence of more concrete thinking patterns. Rather than questions relating to personality, the items that load onto this factor consist of puzzles that require abstract thinking (Karson, Karson, & O'Dell, 1997; Russell & Karol, 1994).

The third factor is C, Emotional Stability, which corresponds to an individual's ability to cope with internal and external stressors. Individuals who score higher on this factor are usually viewed as more mature and emotionally stable, as they are better able to adaptively cope with stress. Conversely, those who score lower on this factor tend to be more emotionally changeable and reactive in response to stressors. The fourth factor, E, is Dominance. Karson, Karson, and O'Dell (1997) propose that this factor may be better described as "assertiveness," and appears to measure an individual's style of self-expression. Those who score higher are more likely to share their opinions, regardless if they are asked or if the timing is appropriate. Furthermore, those who score higher are more likely to have an authoritative and controlling approach towards others. Low scorers tend to be

more submissive, cooperative, and deferential, in an effort to avoid conflict (Karson, Karson, & O'Dell, 1997; Russell & Karol, 1994).

The fifth personality factor, Liveliness (Factor F), measures a person's degree of self-expression and self-control. Those with high scores prefer to be in exciting settings and tend to be more spontaneous, lively, and exuberant than those with lower scores. Lower scorers will present as more serious, cautious, and restrained when engaging with the environment. Factor G, Rule-Consciousness, measures how much societal standards of right and wrong are internalized and used to control one's willingness to conform. Thus, those who score higher on this factor are more likely to be obedient and hold themselves and others to higher standards than those who score lower on this scale. Lower scorers tend to be non-conforming and display a strong need for flexibility and autonomy. Social Boldness is Factor H, and it looks at an individual's likelihood to engage in sensation-seeking behaviors or initiate social contact. Those with low scores tend to be more timid, shy, and uncomfortable in certain social settings (Karson, Karson, & O'Dell, 1997; Russell & Karol, 1994).

The eighth personality factor, I, is Sensitivity. The test developers indicate that this scale could have been referred to as "femininity," as it encompasses the common qualities associated with it. Higher scorers are more likely to interpret their environment based on their internal emotions, and use their sensitivity to make sense of the world around them. Lower scorers tend to rely more on logic

than their emotional experiences. Vigilance, Factor L, looks at one's ability to trust people without questioning their motives. Those who score high on this scale are more likely to be suspicious, guarded, and skeptical of others' intentions in their interactions. Very high scores are more indicative of paranoia, and may suggest hostility towards others. Low scores reflect an individual who is more willing to trust and accept others without questioning their intentions (Karson, Karson, & O'Dell, 1997; Russell & Karol, 1994).

The tenth factor, Abstractedness (Factor M), looks at the way the test-taker attempts to solve problems, and which elements they take into account when making decisions. High scorers are more inclined to be absent-minded, abstractive, and imaginative, whereas a lower scorer is more practical, grounded and solution-oriented. Factor N, Privatness, is a measure of one's propensity for self-disclosure. High scorers are less likely to disclose personal information, and tend to be more guarded and discreet. On the other hand, low scorers are more likely to be forthright, open, and genuine. The twelfth primary factor is O, or Apprehension. This measures one's degree of worry and anxiety. It also correlates to a person's degree of security, or tendency to experience problems related to self-doubt or self-esteem. Low scorers tend to be more self-assured, while high scorers are more likely to experience worry, dread, and lower self-esteem (Karson, Karson, & O'Dell, 1997; Russell & Karol, 1994).

The remaining four factors are exclusively derived from questionnaire data, rather than a combination of behavioral ratings, objective testing ratings, and questionnaire data. Thus, the letter “Q” serves to denote these scales. Factor Q1 refers to Openness to Change, which reflects one’s openness to changes in their lives. High scores on this factor reflect a high tolerance or even preference for change, whereas low scores prefer familiar things, and are more resistant to changes in their lives. Self-Reliance (Factor Q2) refers to one person’s preference to work individually to complete tasks versus in a group. The lower one’s score, the more likely they are to be group-oriented and affiliative. Higher scorers prefer working independently and tend to be more individualistic in nature. Factor Q3 (Perfectionism) is correlated with a person’s tolerance for disorder. Those who score higher tend to be more organized, perfectionistic, and self-disciplined, while lower scorers are more flexible and tolerant of disorganization. The final primary factor, Tension (Factor Q4), refers to a person’s degree of edginess. High scores reflect an individual who may be seen as impatient, whereas low scores are more indicative of a person who is relaxed and patient (Karson, Karson, & O’Dell, 1997; Russell & Karol, 1994).

The five global factors of the 16PF refer to the five largest second-order factors that result from factor analyses of the sixteen primary factors. Extraversion (EX) measures traits that are related to an individual’s degree of extraversion or introversion, and is similar to the one of the Big Five Model. Higher scores reflect

an individual who is socially active and more extraverted, while lower scores suggest a greater likelihood for one to be introverted and socially inhibited. The second global factor of Anxiety (AX), measures an individual's overall mental health or emotional adjustment. High scores may suggest a person is more overwhelmed or keen to acknowledge problems than those with low score. The third global factor of Tough Mindedness (TM) emphasizes the manner in which people tend to solve their problems. A higher scorer on this scale is more likely to be strategic and straightforward in solving problems, while low scorers are more likely to take their emotions into account when reasoning. Independence (IN), the fourth global scale, examines an individual's degree of self-determination. High scorers are more dominant, socially bold, vigilant, and open to change, while low scorers are more subdued and submissive. Finally, the fifth global factor, Self-Control (SC), examines a person's ability to resist internal desires or urges. People with higher self-control are more likely to adhere to conventional standards, while those with lower self-control are less restrained in regard to acting on impulses. (Karson, Karson, & O'Dell, 1997; Russell & Karol, 1994).

As mentioned before, an examinee can predict their individual scores on a scale of 1 to 10 across the 21 scales since the 16PF's profile sheet reveals the descriptors of the 16 primary and 5 global factors and because the obtained scores for each factor are converted to Sten scores (range = 1-10, mean score = 5.5, and standard deviation = 2.5) (Karson, Karson, & O'Dell, 1997).

Development of the SAPP

Prior to the development of the Scale of Accurate Personality Prediction as a measure of self-knowledge, Haight (2000) was one of the first researchers to test whether there was a relationship between people's actual and self-predicted scores for the 16 Personality Factor Questionnaire Fifth Edition (16PF 5th edition). He hypothesized that certain primary factors on the 16PF, as well as some of the global factors, would have significant correlations between the actual and predicted scores. Specifically, Haight (2000) predicted scales C (Emotional Stability), H (Social Boldness), O (Apprehension), and A (Warmth), as well as the global factors of EX (Extraversion) and SC (Self-Control), would yield significant correlations. The results of Haight's (2000) study showed that there were significant correlations found for twenty out of the twenty one variables on the 16PF, which were further supported by paired t-tests to confirm the accuracy of the predictions. The only factor that did not have a significant correlation was factor B. These results offered some evidence that the 16PF could be used to create a measure of individuals' ability to accurately predict their personality features, and in that way, produce a potential measure of self-knowledge (Haight, 2000).

Miller (2000) also compared predicted versus obtained scores across the 16 primary and 5 global factors of the 16PF Fifth Edition for 196 respondents. She then summed the absolute values of the differences between the predicted and obtained scores across the 21 16PF variables to arrive at an overall index of one's

ability to accurately predict his/her scores. This summed measure, with lower scores suggesting better predictive ability, was called the Scale of Accurate Personality Prediction, or SAPP. The formula Miller developed for the SAPP is as follows:

$$\begin{aligned} \text{SAPP} = & [\text{OSA-PSA}] + [\text{OSB-PSB}] + [\text{OSC-PSC}] + [\text{OSE-PSE}] + [\text{OSF-PSF}] + \\ & [\text{OSG-PSG}] + \\ & [\text{OSH} - \text{PSH}] + [\text{OSI-PSI}] + [\text{OSL-PSL}] + [\text{OSM-PSM}] + [\text{OSN-PSN}] + \\ & [\text{OSO-PSO}] + [\text{OSQ1-PSQ1}] + [\text{OSQ2-PSQ2}] + [\text{OSQ3-PSQ3}] + [\text{OSQ4-} \\ & \text{PSQ4}] + [\text{OSEX-PSEX}] + [\text{OSAX-PSAX}] + [\text{OSTM-PSTM}] + [\text{OSIN-} \\ & \text{PSIN}] + [\text{OSSC-PSSC}] \end{aligned}$$

where OSA references the subject's Obtained Score on Scale A, PSA reflects that subject's Predicted Score on Scale A, and so on, for the remaining 15 primary factors and the 5 global factors. Parentheses around the subtracted scores are meant to indicate the absolute value of the subtracted scores.

Miller (2000) also performed one-sample t-tests across the 16PF standardized scores and her sample's obtained scores, and found most of her obtained scores to be similar to those of the normative population. Differences did emerge for factors B, F, G, L, M, O, Q3, Anxiety, and Self-Control, suggesting the overall sample of students used in the study was comparatively more abstract in thinking, more skeptical, more imaginative, more easily perturbed, and livelier, while they are less rule-conscious, self-disciplined, and self-controlled. Those

people who were better predictors of their own personality traits were found to be warm, abstract in reasoning, lively, sensitive, trusting of others, forthright, open to change, outgoing, and intuitive, whereas those who had more difficulty accurately predicting their own personality traits were characterized as reserved, concrete in reasoning, restrained, unsentimental, wary of others, private, traditional, introverted, and unempathetic (Miller, 2000).

Van Sickle (2003) examined the relationship between participants' actual and self-predicted scores on the 16PF in order to assess their prediction accuracy, while additionally measuring the effect of possible response biases. Of the study's 216 participants, half completed the normal 16PF, while the other half completed a profile sheet in which the bipolar dimensions were reversed for counterbalancing purposes. While Haight's (2000) study found that participants were more likely to choose ratings on the right end of the bipolar scales, regardless of apparent social desirability, Van Sickle (2003) found no such prediction bias when comparing participants' predicted means from the normal 16PF to a counterbalanced form of the assessment. Participants showed no significant preference for rating higher scale numbers versus lower scale numbers across all 21 variables. Participants did, however, over-predict their traits in eleven different factors, ten of which tended to be skewed in the perceived direction of social desirability, suggesting a tendency for participants to overestimate their positive qualities (Van Sickle, 2003). With the development of the SAPP as potential measure of self-knowledge, what was next

indicated was to examine its test-retest reliability, its construct validity, and its generalizability to other populations

Reliability of the SAPP

In order to assess the test-retest reliability of the SAPP, Silva (2011) obtained SAPP scores derived from 62 subjects and then again two weeks later. A Pearson correlation coefficient revealed a significant correlation between the two derived SAPP scores ($r = .397$), yet below what is a generally acceptable test-retest correlation (Silva, 2011).

In 2012, Hirsch attempted to replicate Silva's reliability study (2011). With a sample of 58 subjects, Hirsch obtained SAPP scores from an initial trial, and then again two weeks later. The results of the study showed that there was a significant moderate correlation ($r = .566$) between the two derived SAPP scores from the two trials of each participant, which provided more support of the reliability of the SAPP (Hirsch, 2012).

Sverdlova (2012) further examined the test-retest reliability of the SAPP, this time with an interval of four weeks between its original testing and its follow-up one. The sample size for this study included 58 subjects, and the obtained Pearson correlation was once again found to be significant ($r = .466$).

Finally, Elghossain (2012) also replicated Silva's (2011) study in an attempt to establish the SAPP's test-retest reliability, and this time with a test-retest interval of six weeks. She hypothesized that she would be able to establish this form of

reliability beyond that which was found in Silva's (2011) study. Utilizing a sample size of 47 participants, Elghossain (2012) interestingly found a quite elevated correlation ($r = .772$).

All three of these latter test-retest correlations, exceeded the value found by Silva (2011), although not decreasing as might be expected across the three time periods utilized. Additionally, across all of these studies, it must be realized that the test-retest reliability coefficients found are also tempered by the test-retest values of the individual 21 personality factors. Finally, the correlation values of the individual 21 factors found across the three more recent studies strongly mirror those reported for the 16PF factors that have been reported by the test publishers (Elghossain, 2012).

Validity of the SAPP

To further support Miller's (2000) hypothesis that the Scale of Accurate Personality Prediction (SAPP) could be used to measure the construct of self-knowledge, Hood (2001) sought to validate the SAPP score by attempting to establish convergent validity. He did this by correlating SAPP scores of 42 participants to their scores of the self-consciousness score of the Self-Consciousness Scale (1975). Hood predicted that self-consciousness may well overlap with the construct of self-knowledge. Hood also attempted to establish discriminant validity by comparing the SAPP score with the participant's score on the Tennessee Self-Concept Scale (1964). Hood (2001) hypothesized that the SAPP

scores would have a very low and insignificant correlation with the Tennessee Self-Concept Scale, which measured self-esteem. Results from this study determined that the SAPP score did not have a significant correlation with either of the measures that it was being compared to. Therefore, Hood (2001) concluded that the SAPP score did not appear measure the construct of self-reflection; however, discriminant validity was established because the SAPP did not significantly correlate with a measure of self-esteem.

Glywasky (2003) believed that Hood (2001) was unable to effectively establish convergent validity with the SAPP score due to methodological limitations caused by having a small sample size. Thus, Glywasky (2003) replicated Hood's (2001) study but used a larger sample size in order to prevent the same methodological limitations, and to explore if the small sample size was in fact what prevented convergent validity from being established. Glywasky (2003) increased the sample size of the study from 42 participants in Hood's (2001) study to 211 participants. The Private self-consciousness score of the Self-Consciousness Scale was used again in order to attempt to establish convergent validity; however, despite the increase in sample size, Glywasky (2003) was unable to find a correlation between the aforementioned score and the SAPP score. Therefore, it can be determined that the SAPP is not measuring the same construct, and may not reflect that element of accurate self-knowledge (Glywasky, 2003).

In 2002, Anderson sought to establish convergent validity of the SAPP with the Self-Monitoring Scale. The hypothesis was that low scores on the SAPP (i.e. people with a greater ability to accurately predict their personality traits) would produce a significant correlation with those who scored highly on a measure of self-monitoring. People who scored higher on the Self-Monitoring Scale were found in research to be more self-aware, more attuned to situational cues, able to manipulate their behavior to adapt to their environment, and better at interpreting other people's reactions. Individuals who possess these qualities are also those considered to be building greater self-knowledge. To test whether convergent validity could be established between these two measures, participants in the study were administered a 16PF, as well as the Self-Monitoring Scale. The SAPP score was then correlated to the score that the person achieved on the Self-Monitoring Scale. No significant correlations were found between the SAPP scores and the Self-Monitoring Scale scores of the participants. Consequently, convergent validity was unable to be established and it was concluded that the SAPP score is not a measure of an individual's ability to be more self-aware (Anderson, 2002).

In 2005, Hickey attempted to establish construct validity of the SAPP as a measure of self-knowledge. To do this, Hickey (2005) assumed that the more people are in agreement with the way that other people in their lives see them, the more accurately they will be able to accurately predict their own personality traits. In order to use this assumption to establish convergent validity, Hickey had

participants not only complete the 16PF and predict their own personality traits on each of the 21 factors, but she also asked the participants to have two of their family members predict the personality traits of the participant in the study. She then used the family member's predictions of each participant, along with the individual participant's predictions, to develop a concordance measure (CM) to indicate how much the raters agreed on the scores (Hickey, 2005). The results of this test found no significant correlation between the SAPP scores of the participants and the corresponding CM, though the correlation did approach significance in the direction that the researcher predicted. Additionally, no significant findings were established with the CM when comparing participants with either high or low SAPP scores (Hickey, 2005).

In order to further find support for the construct validity of the SAPP as a measure of self-knowledge, Blankemeier (2007) replicated the Hickey's (2005) study. Blankemeier (2007) used a larger sample size and the results of the study indicated that there was a significant correlation between participants' SAPP scores and the obtained concordance measure. Additionally, results demonstrated that when comparing high SAPP scorers with low SAPP scorers on this index, there was a nearly significant difference that showed that individuals who were better at predicting their own personality traits also had family members who predicted the traits of the individual in the same direction (Blankemeier, 2007).

Similar to Hickey's (2005) study, Layton (2005) sought to compare individuals' perceptions of themselves versus how they were viewed by their peers. If the participants' predicted score of themselves (as correlated to their obtained score on the SAPP) were congruent with their peer scores, the accuracy of personality prediction would be demonstrated, and construct validity would be supported for the measure. In order to test this hypothesis, the participants were given the 16PF- Fifth Edition, and asked to predict where on each continuum of the traits examined they believed their scores would fall. Additionally, two non-familial significant others of the target participants were asked to rate their peer on the same 16PF factors, and self-ratings versus peer ratings were then compared, again using derived concordance measures for the peer ratings. Like previous validation efforts, no significant results were found by the study, although the results were in the direction predicted.

Since Layton's (2005) correlation yielded a positive, yet nonsignificant measure, Wolf (2006) attempted to replicate the study in an effort to obtain a significant correlation, which would provide construct validity for the SAPP. Demographics were collected for both target and peer groups, including how long the peer had known the target individual, how well the peer felt they knew the target participant, and how well the peer participant felt the target participant knew them. The last two measurements were derived from peer participants' ratings on a scale of 1 to 10, with 1 indicating they felt they did not know the peer well, and 10

indicating they felt the peer extremely well. Overall, Wolf (2006) yielded a significant Pearson correlation between SAPP scores and CM scores ($r=.419$, $p < .05$). There also appeared to be a directional concordance between participants with lower SAPP scores, which indicates higher self-knowledge, having greater concordance with how the peers viewed them than participants with higher SAPP scores, indicating lower self-knowledge (Wolf, 2006).

These two latter studies (e.g., those by Layton {2005} & Wolf, 2006} offer together some evidence for the construct validity of the SAPP.

In an effort to validate the SAPP score through an expert validation method, Alfandor (2006) compared the SAPP scores of individuals that were currently undergoing therapy with their therapists' ratings of the subjects' degree of self-knowledge. Alfandor (2006) predicted that the lower the SAPP score (greater self-knowledge), the higher the clinician's rating of the client's self-knowledge would be. The clinicians were given a survey in which they were asked to rate how much self-knowledge they believed their client had on a scale of 0-10. The score of zero meant the client had "no self-knowledge," while the score of ten indicated that the client had "very high self-knowledge." When the calculated SAPP scores from the clients were correlated with their therapist's prediction of their self-knowledge, there were no significant results found. This meant that through the expert validation method, the Scale of Accurate Personality Prediction was unable to be

validated (Alfandor, 2006). One of the most obvious limitations of this study was the rather small sample size used ($N = 29$).

Winter (2002) attempted to provide construct validity for the SAPP measure, by comparing mean SAPP scores between two groups of individuals identified *a priori* to be different in their accuracy of self-knowledge. It was hypothesized that Graduate Psychology Students ($n=22$) would better predict their personality traits than Graduate Engineering Students ($n=10$). Results showed no significant differences in mean SAPP scores between the two groups, thus failing to provide construct validity for the SAPP measure (Winter, 2002).

Though Winter (2002) was unable to demonstrate the validity of the SAPP score through a priori validation, it was hypothesized that the greatest limitation of that study was its very small sample size. In order to reassess the goal of Winter's (2002) study, Grossenbacher (2006), using a higher number of participants, attempted to replicate the original study with the same attempted validation. To do this, Grossenbacher (2006) collected SAPP scores from students who had obtained degrees in either psychology or engineering and were practicing in their respective fields. She then tested her hypothesis that psychology graduate students and practicing psychologists as a group be better predictors of their personality traits, which would be shown through lower SAPP scores, than the engineering graduate students and practitioners. In the results of the replication, there was a significant difference between the mean SAPP scores for the two different groups, with the

hypothesis being supported as the psychology group obtained lower SAPP scores. Therefore, these results provided some evidence of the construct validation for the SAPP, support that it may well be a measure of self-knowledge (Grossenbacher, 2006).

The most recent validity study was conducted by Pass (2013), who sought to further validate the construct of the SAPP score as a measure of self-knowledge. Additionally, individuals' SAPP scores were compared with their scores on the items from the Integrative Self-Knowledge Scale (ISKS), in an effort to establish convergent validity between the two measures that purport to assess components of self-knowledge. Results from t-test analyses, which compared obtained test results to standardized samples, revealed that the majority of the scores were comparable. However, findings did not support the hypothesis that the SAPP score measures the same construct measured in the ISKS, as SAPP scores failed to significantly correlate with the ISKS.

Standardization of the SAPP

In an attempt to standardize the SAPP score, McElligott (2014) replicated Miller's (2000) original study utilizing a larger database of 609 respondents. McElligott (2014) hypothesized that differences between 16PF standardized and obtained scores for this sample would have the same statistically significant differences that Miller (2000) found in her study, and that the mean, standard deviation, and range of the SAPP scores would be similar to the scores obtained by

Miller (2000). McElligott (2014) also hypothesized that individuals in this sample would tend to predict their scores in the direction of more favorably perceived personality characteristics based on social desirability, and that the newly derived STEN scores would be the same across the two methods of determining them. The results of one-sample t-tests showed that the majority of obtained scores for this sample were different than the ones from the normative sample, but that the mean and standard deviation were similar to those obtained in Miller's (2000) study. Results indicated that individuals appeared to rate themselves as being more rule-conscious, emotionally stable, and better able to adapt than their obtained scores suggested. Lastly, STEN scores were the same across the two methods of determining them.

Generalizability of the SAPP

In order to test the generalizability of the SAPP, Rodriguez (2011) utilized the SAPP scores from 50 participants who identified as Hispanic/Latino. A t-test was conducted to compare Miller's (2000) mean SAPP score to the study's findings, which showed no significant difference. Rodriguez (2011) found it reasonable to consider that the previously obtained SAPP psychometrics are generalizable to the Hispanic/Latino population.

Similarly, Zeng (2015) collected data from 36 participants who self-identified as Asian and compared data to three random samples, majority of whom identified as Caucasian, from an archival database of 609 subjects. An independent-

sample t-test was conducted in order to compare the SAPP group means of the Asian sample to those of the random samples. Results from the t-test analyses revealed two out of the three random samples (#1 and #3) had no significant difference in mean SAPP scores in comparison to the Asian sample. This suggests that it is reasonable to consider the SAPP score may well be generalizable to the Asian population (Zeng, 2015).

Statement of Purpose for the Present Study

The purpose of this current study is to examine levels of self-knowledge using the SAPP across different generations, including Baby Boomers, Generation Xers, and Millennials. It is the hope that this research will supplement our knowledge regarding lifespan development and the potential differences in the degree of self-knowledge across generational cohorts.

Methods

Subjects

The current study utilized existing data that was collected between the years 2000 and 2012 through multiple testing sessions with participants. At the time of this study, the database included over 600 subjects who completed the 16PF and later predicted their individual scores across the 21 scales. Subjects included college students, individuals from the community, and other professionals. Since subject data has been de-identified, participants' exact birth years were unavailable. In order to categorize participants as Baby Boomers, Generation Xers, and Millennials, their age at the time of their participation was subtracted from the year of the data collection when they participated. Therefore, their birth year was retroactively calculated, and used with the generational cutoffs to determine if they met the criteria for one of the three cohort groups. Using these calculations, 61 Baby Boomers were identified within the database. For the other groups, the random sample function of IBM's Statistical Package for the Social Sciences (SPSS) was used to select 61 random subjects from the Generation X group and an additional 61 random subjects from the Millennial group. The demographics of the three groups of subjects used in this study were identified with statistical analyses using SPSS and reported in the Results section.

Procedure

Approval from the Florida Institute of Technology Institutional Review Board was obtained prior to the proposal of the research. In order to classify subjects into their appropriate generational groups, birth years were retroactively calculated, as mentioned above. In order to have an even number of participants from each birth cohort, random samples of the Generation X and Millennial groups were obtained to match the number of Baby Boomers in the archival data set. The SAPP scores and demographics were then analyzed in SPSS in order to compare the SAPP scores of each of the three groups.

In regard to originally obtaining the SAPP scores, participants were initially administered the 16PF and were provided a scoring sheet for the 16PF that was blank and did not have their scores. Participants were then asked to rate themselves and where they believed they fell on the sixteen personality factors, as well as the five global factors included on the scoring sheet. The scores were then compared to the obtained 16PF scores on each of those same sixteen factors and five global factors, and the difference between the two scores was taken. The absolute value of that difference comprised the SAPP score that is used as the measure of self-knowledge. The SAPP scores have been adjusted through a linear transformation, so that high scores now reflect higher levels of self-knowledge, and lower scores, less levels of self-knowledge.

Analysis

In order to statistically analyze the differences between self-knowledge scores between the Baby Boomer, Gen-Xer, and Millennial birth cohorts, a one-way ANOVA was conducted in order to assess for significant differences in participants' SAPP scores. In order to examine both the main effects of birth cohort and level of education, and the interaction effect between birth cohort and level of education, a 3 x 4 multifactorial ANOVA was conducted. In order to assess hypotheses 3-5, one-way ANOVAS were conducted to assess for the significance of the difference between each birth cohort's mean scores on the personality factor.

Hypotheses

Based on the findings from the literature, the following hypotheses are proposed:

1. There will be a significant difference in SAPP scores across the three generational cohorts. Post-hoc analyses will reveal that the Baby Boomer cohort will have the highest SAPP scores, indicating the highest level of self-knowledge.
2. There will be significant main effects and a significant interaction effect of generational cohort and education level on SAPP scores. Post-hoc analyses will reveal that Baby Boomers with the higher levels of education will have significantly higher SAPP scores.

3. Baby Boomers will have significantly higher scores on the 16 PF personality factor of Rule-Consciousness (G) than those in the other generational cohorts.
4. Generation X will have significantly higher scores on the 16 PF personality factor of Openness to Change (Q1) than those in the other generational cohorts.
5. Millennials will have significantly lower scores on the 16 PF personality factor of Abstractedness (M) than those in other generational cohorts.

Results

Demographic Results

A total of 183 subjects were used in the study from the archival dataset. The 183 subjects were evenly split into generational cohorts, including 61 Baby Boomers, 61 Generation Xers, and 61 Millennials. The Baby Boomers' ages ranged from 37-65 at the time of testing, while the Generation Xers ranged from 24-36, and the Millennials 18-23. Overall, the mean age of participants was 33.62. The period of testing years ranged from 2000-2012.

The majority of participants were female (54.6%) and the rest were male (45.4%). Their years of education ranged from 12 years of education (High School diploma equivalency) up to 23 years of education, with the mean amount of education falling around 16 years, which is roughly a college degree. Most of the sample had been in school for 17 or more years (37.7%), which likely means they have a Master's or Doctorate Degree; followed by 13 to 15 years, or Some College (31.7%); 16 years, or Bachelor's Degree (24.0%); and then 12 years, or a High School Diploma (6.6%). About 80% of the participants used in this study reported their occupation, while 12% omitted their occupation. The overall sample was predominantly comprised of Students (46.4%), followed by White Collar employees (24.6%), Other Unspecified employment (8.2%), Unemployed/Homemaker (5.5%), Retired (1.6%), and Blue Collar (1.6%).

Of the 78.7% of participants who reported a marital status, the majority were single (44.8%), married (24.6%), divorced (8.2%), or widowed (1.1%). The remaining 21.3% of participants chose not to report their marital status. In regard to race and ethnicity, the vast majority of participants identified as Caucasian (74.9%), followed by Hispanic (12.0%), Asian (6.6%), Other (3.8%), and African American (2.7%). Also reported for 78.8% of participants was their geographic location within the United States. The highest percentage of participants were from the Southeast (62.8%), followed by the Northeast (10.9%), Midwest (3.3%), and Southwest (1.6%). The remaining 21.3% of participants chose not to report their geographic location.

Hypothesis 1

For hypothesis one, a one-way ANOVA was conducted to examine whether participants' SAPP scores would significantly differ across generational cohorts, and more specifically, if participants categorized as Baby Boomers would have higher SAPP scores than Generation Xers or Millennials, therefore indicating higher levels of self-knowledge. Participants were assigned to one of three groups by their birth cohort (group 1: Baby Boomers; group 2: Generation Xers; group 3: Millennials). Levene's test suggested that the homogeneity of variances assumption was fulfilled, $F(2,180) = .36, p = .70$. ANOVA results showed that there was not an overall significant mean difference among the three groups in regard to their SAPP scores, $F(2,180) = .47, p = .63$. These results do not support the hypothesis that

SAPP scores vary significantly across generational cohorts, or that Baby Boomers have higher SAPP scores, thus indicating a greater level of self-knowledge.

Table 1

One-Way Analysis of Variance of Birth Cohort on SAPP scores

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Between groups	2	170.08	85.04	0.47
Within groups	180	32740.05	181.89	
Total	182	32910.13		

Hypothesis 2

For hypothesis two, a two-way ANOVA was conducted to examine the effects of birth cohort and education level on participants' SAPP scores. Levene's test was violated, indicating that homogeneity of the variance cannot be assumed, which suggests that variances in SAPP scores were not statistically equivalent for groups, $F(11,171) = 2.37, p = .009$. The 3 x 4 ANOVA with generational cohort (group 1: Baby Boomers; group 2: Generation Xers; group 3: Millennials) and education level (group 1: High School; group 2: Some College; group 3: Bachelor's; group 4: Graduate School) as between-subjects factors revealed no main effect for generational cohort, $F(2,171) = .18, p = .83$, or education level, $F(3,171) = .88, p = .45$. Additionally, there was no significant interaction effect between generational cohort and education level on SAPP scores, $F(6,171) = 1.31, p = .26$. These results do not support the hypothesis that being a Baby Boomer with the highest education

level would cause one to have a higher SAPP score, and therefore greater self-knowledge.

Table 2

Factorial ANOVA Results of the Effects of Birth Cohort and Education Level on Adjusted SAPP scores

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>
Between	2090.35	11	190.03	1.05
Birth Cohort	65.99	2	32.99	.18
Education Level	474.10	3	158.03	.88
Birth Cohort * Education Level	1416.36	6	236.06	1.31
Within	30819.78	171	180.23	
Total	32910.13	182		

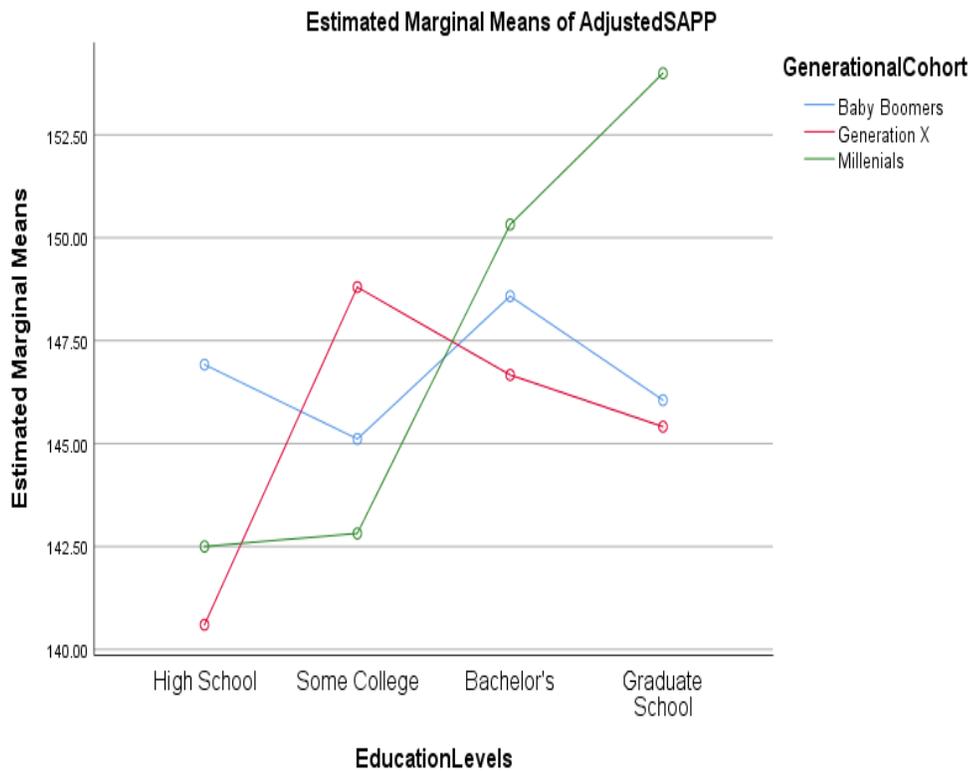


Figure 1. Analysis of Variance (ANOVA) between Generational Cohort and Education Level on SAPP Scores

Hypothesis 3

For hypothesis three, a one-way ANOVA was conducted to examine whether Baby Boomer participants would have significantly higher scores on the 16PF personality factor of Rule Consciousness (G) than those in the other generational cohorts. Levene's test suggests that the homogeneity of variances assumption was fulfilled, $F(2,180) = 1.90, p = .15$. ANOVA results showed that there was not an overall significant mean difference among the three groups in regard to their scores on the personality factor of Rule-Consciousness (G), $F(2,180)$

= 1.04, $p = .36$. These results do not support the hypothesis that Baby Boomers will score significantly higher on the 16PF personality factor Rule-Consciousness (G) than either Generation Xers or Millennials.

Table 3

One-Way Analysis of Variance of Birth Cohort on 16PF Personality Factor of Rule-Consciousness (G)

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Between groups	2	5.42	2.71	1.04
Within groups	180	471.44	2.62	
Total	182	476.86		

Hypothesis 4

For hypothesis four, a one-way ANOVA was conducted to examine whether Generation Xers would have significantly higher scores on the 16PF personality factor of Openness to Change (Q1) than those in the other generational cohorts. Levene's test suggests that the homogeneity of variances assumption was fulfilled, $F(2,180) = .42, p = .66$. ANOVA results showed that there was not an overall significant mean difference among the three groups in regard to their scores on the personality factor of Openness to Chance (Q1), $F(2,180) = 1.56, p = .21$. These results do not support the hypothesis that Generation Xers will score significantly higher on the 16PF personality factor Openness to Change (Q1) than either Baby Boomers or Millennials.

Table 4

One-Way Analysis of Variance of Birth Cohort on 16PF Personality Factor of Openness to Change (Q1)

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Between groups	2	8.67	4.33	1.56
Within groups	180	500.95	2.79	
Total	182	509.62		

Hypothesis 5

For hypothesis five, a one-way ANOVA was conducted to examine whether Millennials would have significantly lower scores on the 16PF personality factor of Abstractedness (M) than those in the other generational cohorts. Levene's test suggests that the homogeneity of variances assumption was fulfilled, $F(2,180) = .96, p = .39$. ANOVA results showed that there was not an overall significant mean difference among the three groups in regard to their scores on the personality factor of Abstractedness (M), $F(2,180) = .60, p = .55$. These results do not support the hypothesis that Millennials will score significantly lower on the 16PF personality factor Abstractedness (M) than either Baby Boomers or Generation Xers.

Table 5

One-Way Analysis of Variance of Birth Cohort on 16PF Personality Factor of

Abstractedness (M)

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Between groups	2	3.64	1.82	.60
Within groups	180	545.15	3.02	
Total	182	548.79		

Discussion

The present study sought to examine levels of self-knowledge amongst Baby Boomers, Generation Xers, and Millennials by using the SAPP. The purpose of the study was to highlight the significant effect an individual's birth cohort has on their degree of self-knowledge. It was hypothesized that Baby Boomer's would have the highest SAPP scores across birth cohorts, thus signifying the highest degree of self-knowledge. However, overall the statistical analyses yielded no significant results, suggesting that there is no difference among SAPP scores across generational cohorts, indicating that there are no significant differences in levels of self-knowledge between generational cohorts. While the Baby Boomer birth cohort had a vast number of social and cultural changes throughout their lives, which may have spurred self-exploration, in addition to a longer amount of time to reflect on who they are as people, there was no evidence that it contributed significantly to having higher scores when compared to the other birth cohorts (Sessa, Kabacoff, Deal, & Brown, 2007).

Further, this study investigated whether an individual's level of education and generational cohort had an impact on their self-knowledge. It was hypothesized that participants with the highest level of education, who belonged to the Baby Boomer cohort, would also have the highest level of self-knowledge compared to participants with fewer years of education in the Generation X or Millennial groups. However, there was not a significant link between having a higher level of

education and a higher level of self-knowledge. Despite the notion that acquiring self-knowledge is an active process that requires commitment and complex thinking processes, much like the acquisition of scholarly knowledge, there is no evidence to suggest that increased self-knowledge is associated with higher levels of education (Carlson, 2013).

In addition to examining differences in self-knowledge between groups, the study also looked for generational differences in specific 16PF personality factors. First, it was hypothesized that Baby Boomers would score higher on the 16PF personality factor Rule-Consciousness (G), indicating a greater likelihood to value rules and dutifulness, and holding themselves and those around them to higher standards. However, results showed no significant differences in scores on Rule-Consciousness (G) among birth cohorts. Although literature indicates that Baby Boomers grew up in mostly traditional families and were raised to have more conventional values, there is no evidence to suggest that Baby Boomers are more rule-conscious than other generational cohorts (Sessa, Kabacoff, Deal, & Brown, 2007). Additionally, it was hypothesized that Generation Xers would score higher on the 16PF personality factor Openness to Change (Q1), indicating a greater tolerance, or even preference, towards change. In the research conducted by Sessa, Kabacoff, Deal, and Brown (2007) it is suggested that given their experiences with instability in families and society, Gen Xers are comfortable with change; however, there is no evidence in the current study to support that they were more open than

other generational cohorts. Lastly, it was hypothesized that Millennials would score lower on the 16PF personality factor Abstractedness (M), suggesting a style of thinking that is more solution-focused and less complex. In their research conducted in 2017, Giambatista, Hoover, and Tribble found that Millennials are more likely than those of previous generations to avoid complexity in gathering and processing information in shaping their perception, judgment, and learning. Although this would suggest that Millennials tend towards a style of thinking that is less abstract, there is no evidence in the current study to support that their abstractedness is any lower than that of other generational cohorts.

Although the current study yielded no significant results, there are limitations to the results that may have influenced the results, and should therefore, be noted. One of the major limitations was not having access to the archival subject's exact birth years. Participants were placed into birth cohorts by using retroactive calculation, and therefore, there may have been a portion of the dataset that was not included or incorrectly included, which may have influenced the results found. As others continue with generational research, it will be important to include year of birth in the demographics in order to eliminate incorrect categorization. One of the other limitations of the research was that the data was collected between 2000 and 2012, with the majority of data collected in 2000. Due to the nature of our fast-paced and ever-changing society, it is crucial that data remain current. Much of the research on differences in generational cohorts has

been conducted in recent years, and it is likely that using archival data impacted the current study's results.

Another limitation of this current study is the demographics of the overall sample used. Though the demographics are somewhat representative based on the literature, there were some notable absences that could have impacted the study's results. Most of the participants in the study were Caucasian, female, with 17 or more years of education, indicating some graduate schooling. Additionally, majority of the participants used in the study reported their occupation as "student," suggesting the sample may not have prior or current experience in the workforce. This may have impacted results of the current study as much of the past research studied employees, and thus, the sample may have inadequately represented the overall population. In future research, it is important that the overall sample and comparison groups be more adequately representative of the population at large.

With regard to the future of research relating to the Scale of Accurate Personality Perception, generational cohorts should be more closely examined. As past literature suggests various differences across generational cohorts, it is likely that limitations may have impacted the study's results. Therefore, it would be beneficial to replicate the study with a sample that is better representative of the population and with data collected in more recent years. In conducting further research, it is hopeful that we will gain a better understanding of self-knowledge and how to facilitate its growth in humans of varying backgrounds.

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Appendix

Primary Factors			
Factor	Left Meaning	Standard Ten Scores (STEN)	Right Meaning
A: Warmth	Reserved, Impersonal, Distant	1...2...3...4...5...6...7...8...9...10	Warm, Outgoing, Attentive to Others
B: Reasoning	Concrete	1...2...3...4...5...6...7...8...9...10	Abstract
C: Emotional Stability	Reactive, Emotionally Changeable	1...2...3...4...5...6...7...8...9...10	Emotionally Stable, Adaptive, Mature
E: Dominance	Deferential, Cooperative, Avoids Conflict	1...2...3...4...5...6...7...8...9...10	Dominant, Forceful, Assertive
F: Liveliness	Serious, Restrained, Careful	1...2...3...4...5...6...7...8...9...10	Lively, Animated, Spontaneous

G: Rule-Consciousness	Expedient, Nonconforming	1...2...3...4...5...6...7...8...9...10	Rule-conscious, Dutiful
H: Social	Shy, Threat-Sensitive, Timid	1...2...3...4...5...6...7...8...9...10	Socially Bold, Venturesome, Thick-skinned
I: Sensitivity	Utilitarian, Objective, Unsentimental	1...2...3...4...5...6...7...8...9...10	Sensitive, Aesthetic, Sentimental
L: Vigilance	Trusting, Unsuspecting, Accepting	1...2...3...4...5...6...7...8...9...10	Vigilant, Suspicious, Skeptical, Wary
M: Abstractedness	Grounded, Practical, Solution-Focused	1...2...3...4...5...6...7...8...9...10	Abstracted Imaginative, Idea-Oriented

N: Privatness	Forthright, Genuine, Artless	1...2...3...4...5...6...7...8...9...10	Private, Discreet, Non- disclosing
O: Apprehension	Self-assured, Unworried, Complacent	1...2...3...4...5...6...7...8...9...10	Apprehensive, Self-Doubting, Worried
Q1: Open to Change	Traditional, Attached to Familiar	1...2...3...4...5...6...7...8...9...10	Open to Change, Experimenting
Q2: Self-Reliance	Group- oriented, Affiliative	1...2...3...4...5...6...7...8...9...10	Self-Reliant, Solitary, Individualistic
Q3: Perfectionism	Tolerates Disorder, Unexacting Flexible	1...2...3...4...5...6...7...8...9...10	Perfectionistic, Organized, Controlled
Q4: Tension	Relaxed, Placid, Patient	1...2...3...4...5...6...7...8...9...10	Tense, High Energy, Impatient, Driven

Global Factors

<u>Factor</u>	<u>Left Meaning</u>	<u>Standard Ten Scores (STEN)</u>	<u>Right Meaning</u>
EX: Extraversion	Introverted, Socially Inhibited	1...2...3...4...5...6...7...8...9...10	Extraverted, Socially Participating
AX: Anxiety	Low Anxiety, Unperturbed	1...2...3...4...5...6...7...8...9...10	High Anxiety, Perturbable
TM: Tough-Mindedness	Receptive, Open-Minded Intuitive	1...2...3...4...5...6...7...8...9...10	Tough- Minded, Resolute, Unempathetic
IN: Independence	Accommodating, Agreeable, Selflessness	1...2...3...4...5...6...7...8...9...10	Independent, Persuasive, Willful
SC: Self-Control	Unrestrained, Follows Urges	1...2...3...4...5...6...7...8...9...10	Self- Controlled, Inhibits Urges
