The Impact of Cognitive Complexity on Frequency-Based Measurement Big Five Measures

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Abstract

Recent research on the factor structure of the Five-Factor Model has called into question the assumption that the five factors are universal across all individuals. Whereas individuals demonstrating average levels of cognitive complexity exhibit the common five factor pattern, both Bowler, Bowler, and Phillips (2009) and Bowler, Bowler, and Cope (in press) noted that individuals with higher levels of cognitive complexity exhibit more than five factors and individuals with lower levels of cognitive complexity exhibit less than five. The present study sought to examine the impact of cognitive complexity on a five-factor measure that utilized a frequency-based response format developed by Edwards and Woehr (2007). Overall, results concurred with previous findings, with cognitive complexity influencing the number of factors evidenced. Specifically, individuals with low, average, and high levels of cognitive complexity exhibited five-, six-, and seven-factor models of personality, respectively. Implications of the appropriateness of frequency-based personality measurement are discussed.

Keywords: cognitive complexity; five factor model; personality

1. Introduction

The five-factor model (FFM) is the dominant paradigm in personality research and is among the most influential models in all of psychology (McCrae, 2009).

The five factors have been used in a multitude of different areas of research, including examinations of career self-efficacy (Hartman & Betz, 2007), entrepreneurship (Zhao & Seibert, 2006), Holland's occupational types (Barrick, Mount, & Gupta, 2003), job performance (Barrick & Mount, 1991), job satisfaction (Judge, Heller, & Mount, 2002), leadership (Bono & Judge, 2004), organizational commitment (Erdheim, Wang, & Zickar, 2006), organizational justice (Shi, Lin, Wang, & Wang, 2009), retirement decisions (Oliver, Demetre, & Corney, 2010), and team performance (Peeters, Van Tuijl, Rutte, & Reymen, 2006).. Although the FFM enjoys support from many in the field of personality research, issues related to its self-report format and psychometric properties remain (Block, 1995, 2010; Eysenck, 1992).

In addition to the psychometric questions, criticisms regarding the basic nature of the FFM have also arisen in the literature. Eysenck (1992) argued that three of the factors were primaries and at the highest level, that these three primary factors were inter correlated and linked with psychoticism, and further contended that the model lacked a nomological network. Fiske (1994) questioned whether five factors were indeed sufficient to fully explain personality. Although he acknowledged that the current five factors allowed for differentiation among individuals, he questioned whether additional factors may also exist. Perhaps the most influential critic of the FFM was Block (1995), who took issue with the use of factor analysis to provide accurate dimensions. Additionally, Block raised the point that the lexical analyses used to generate the scales were scientifically questionable. Another obvious problem with traditional personality measurement stems from the acquiescence and response distortion that plagues all traditional Likert-style self-report measures (Barrick& Mount, 1996; Holden, 2008).

One potential solution to some of these issues—particularly those of response distortion—is the utilization of a frequency-based response format. Developed by Edwards and Woehr (2007), frequency-based response formats provide a potential substitute for typical Likert-type response formats. Specifically, initial research indicates that the factor structure, scale reliabilities, and convergent validity coefficients of these two response formats are comparable. Moreover, evidence suggests that the frequency-based response format is less susceptible to deliberate response distortion than Likert-type formats, and that consistency information can increase predictive validity (Fleisher, Edwards, Woehr, & Cullen, 2009).

The proposed study utilizes a frequency-based measure of the FFM (Edwards &Woehr, 2007) as an alternative to traditional measures of the five factors. Previous research has examined the relationship between cognitive complexity and the FFM, with differences in personality structures emerging between subgroups of low, average, and high cognitive complexity (Bowler, Bowler, & Phillips, 2009). The present study seeks to determine whether the cognitive complexity-engendered distortions of the factor structure of the FFM (Bowler et al., 2009) maybe diminished by employing an alternate response format. The appropriateness of utilizing alternate response formats for measuring the FFM is also discussed.

1.1 History of the Five Factor Model

The development of the five-factor model of personality can be traced back many generations. Webb (1915) used instructor ratings of male students on 48 different characteristics to derive two factors, namely intellect (*g*) and will (*w*). Further analysis of Webb's data revealed a third factor,cleverness (Garnett, 1919). In Cattell'siteration (1933), 62 male college students rated their peers using 46 bipolar rating scales which resulted in four factors: adjustment, maturity, surgency, and will. Fiske (1949) reanalyzed data from 22 ofCattell's rating scales. These analyses yielded five factors: confident self-expression, conformity, emotional control, inquiring intellect, and social adaptability. This five-factor pattern continued to reappear in the works of numerous other researchers. Norman (1963) noted a five-factor solution using 20 peer rating scales. Borgatta (1964), using sentence fragments rather than the bipolar rating scales, also noted five factors, which he labeled assertiveness, emotionality, intelligence, likeability, and responsibility. Similarly, Smith (1967) analyzed first-year college students' ratings of each other on 42 bipolar rating scales, which resulted in five factors, namely agreeableness, emotionality, extraversion, strength of character, and refinement. It is clear from this brief history and the variations in assigned labels that no clear consensus had yet been reached with regard to the nature of the factors.

Goldberg (1980) advocated the FFM on the basis of its stability, in lieu of other models with more or less factors, and the FFM subsequently enjoyed increased popularity and usage in the 1980's. Factor analyses of a comprehensive set of trait adjectives led to the development of synonym clusters for use in future measures (e.g., Goldberg, 1990). Refinement of these measures gave rise to the Big-5 Markers, which demonstrated robustness in both self and peer ratings (Goldberg, 1992).

Costa and McCrae, who originally recommended a three-factor model including neuroticism, extraversion, and openness (1976), later suggested the addition of agreeableness and conscientiousness (1985). Costa and McCrae, as well as Goldberg, published extensive evidence in support of the FFM over the next two decades (Goldberg, 1999; McCrae, 2009).

1.2 Current Conceptualization of the Five-Factor Model

Several measures of the FFM have been developed since the 1980's. Two frequently cited self-report measures are the NEO (Costa & McCrae, 1992) and Goldberg's unipolar markers (Goldberg, 1992). The NEO (Costa and McCrae, 1992) is comprised of short statements designed to assess neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. Participants are asked to indicate the degree to which they agree or disagree with each statement using a five-point scale ranging from *strongly disagree* to *strongly agree*. Goldberg's unipolar markers (Goldberg, 1992) consists of a list of characteristics for which respondents indicate the accuracy with which each term describes them using a nine-point scale ranging from *extremely inaccurate* to *extremely accurate*. The corresponding labels of the five-factors ascribed to Goldberg's (1992) measure are emotional stability, surgency, intellect, agreeableness, and conscientiousness. Semantic differences aside, these two measures, as well as the numerous other measures of the FFM, are considered to assess the same five dimensions.

1.3 Criticisms of the Five-Factor Model

Although support for and use of the FFM has undoubtedly grown over the past few decades, it has nevertheless been the target of significant criticism (c.f. Block, 1995, 2010; Eysenck, 1992; Fiske, 1994). First and foremost, following the publication of Costa and McCrae (1992), Eysenck (1992) expressed five key criticisms of the FFM. First, he noted that the FFM contained three primary factors that were highly intercorrelated, and that those factors were closely linked with psychoticism. Secondly, he contended that Costa and McCrae (1992) formed inappropriate conclusions from factorial evidence, and that three factors should have been reported rather than five. Third, he argued that the FFMlacked a nomological network and suffered from limited theoretical support. Last, he took issue with their failure to provide a biological link between genetics and behavioral organization.

Block (1995) provided extensive criticism of the FFM. Of particular note, Block (1995) suggested that factor analysis alone was insufficient to provide adequate support for concepts in personality research, as a variety of influences on behavior may go unrecognized. He additionally took issue with the utilization of a lexical analysis and its questionable methodologies, as well as the use of lay-person terminology, which he suspected could engender a lack of cohesiveness (Block, 1995).

Fiske (1994) underscored the point that other instruments employ comparable units of measure, but these units are far from identical. Additionally he noted thatuse of the lay perceptions of others as scientific variables was problematic, and that a distinction was needed between folk traits and psychological or technical traits. He further questioned whether five factors were sufficient and contended that "there may well be other factors that can be conceptualized and for which appropriate items can be located so that factors can be identified" (Fiske, 1994, p. 123), further noting that the empirical utility of the FFM would be challenged, particularly in applied settings.

Block (2010)additionally argued that the FFM was inappropriate for studying personality in early childhood. He called into question the factor analysis paradigm, stating that it should not be the only way to conceptualize the FFM. Block proposed that higher order factors would contribute to the understanding of personality. However, John and Naumann (2010) addressed Block's (2010) criticisms, stating that the FFM is a useful way to organize the components of personality, and especially as it provides a common nomenclature for researchers. They concluded that the FFM will not stifle or pigeonhole broader research on personality, and that clarification of the field will only improve over time. In another response to Block's (2010) article, McAdams and Walden (2010) claimed that the FFM is appropriate for actors on a social stage," but it is not adequate "in a broader and deeper manner, from the standpoints of the person as motivated agent and autobiographical author" (p. 55). The authors state that the language of traits does not adequately tap into the goal-striving layer of personality that develops during one's critical teenage years.

1.4 Use of Self-Report Measures

The typical scales used to measure the FFM are the NEO (Costa & McCrae, 1992) and Goldberg's unipolar markers (Goldberg, 1992).

The NEO features a self-report format in which participants are asked to indicate their level of agreement with a series of short statements using a five-point scale (i.e., 1 = Strongly Disagree to 5 = Strongly Agree). In contrast, Goldberg's unipolar markers asks participants to indicate the level of accuracy with which each of a list of single-word terms describes them using a nine-point scale (i.e. 1 = Extremely Inaccurate to 9 = Extremely Accurate). The descriptors of the five factors in the NEO are labeled agreeableness, conscientiousness, extraversion, neuroticism, and openness to experience, whereas the Goldberg measure uses the labels agreeableness, conscientiousness, emotional stability, intellect, and surgency.

Of particular concern is that self-report measures, such as those used to measure the FFM, are subject to response distortions. Paulhus (1984) described two forms of response distortion: self-deception and impression management. Self-deception occurs when respondents actually believe their skewed responses to be accurate, while impression management occurs when respondents deliberately falsify their responses. With regard to the occurrence of these response distortions in the FFM, Schmit and Ryan (1993) factor analyzed data from two distinctly different populations: students and job applicants. Analyses revealed the typical five factors in the student sample, but the job applicant sample yielded a sixth 'ideal-employee' factor, indicating that participants in the applicant sample exhibited an additional set of personality characteristics. These findings provide further support for the role of impression management in socially desirable responding to self-report measures.

In addition, Barrick and Mount (1996) discovered that job applicants distorted their responses using both self-deception and impression management. Interestingly, the authors did not find a significant difference between the two types of response distortion. They concluded that while both types of response distortion influenced scores on the personality measure, there was no attenuation in terms of predictive validity. Whether using short statements (Costa and McCrae, 1992) or unipolar markers (Goldberg, 1992), response distortion in either form (i.e., self-deception or impression management) is problematic (Paulhus, 1984). Although job applicants may benefit from response distortion (Barrick & Mount, 1996), a more accurate method of measurement is both necessary and possible.

1.5 Frequency-Based Personality Measurement

Whereas the Likert-type response format has been widely used to assess personality, an alternative measure has recently been introduced. Edwards and Woehr (2007) developed a frequency-based response format as an alternative to traditional self-report measures. The researchers used the Goldberg 100 Unipolar Markers and asked respondents to assign percentage values to indicate how often each of the three response categories reflected their behavior over the past 6 months. The three response categories (very inaccurate, neither accurate nor inaccurate, and very accurate) are required to sum to 100% for each of the items. The percentages were then combined using weights to create a score for each item. Compared to the traditional Likert-type format, the frequency-based measure provided comparable reliability estimates. Inter correlations among the five personality dimensions were also similar. The authors also note that using a frequency-based measure allows for the estimation of temporal stability. This method is an improvement on Likert-type measures primarily because of the addition of a cross-time measure of behavioral consistency (Edwards &Woehr, 2007).

1.6 Cognitive Complexity

Bieri (1955) described cognitive complexity as the degree to which one can differentiate among various constructs in the environment. More specifically, the complexity of one's cognitive system can be measured in the degree of differentiation among perceptions of others. Bieri added that individuals who are cognitively complex differentiate highly, while those who are cognitively simple tend to differentiate poorly. Cognitive complexity also appears to be related to the tendency to predict accurately the differences between oneself and others. Kelly (1955) is credited with developing the most widely used system of measuring cognitive complexity, the Role Construct Repertory Test. This test will be discussed in more detail in a future section.

Vannoy (1965) found that the inter-correlations between different tests of cognitive complexity cannot be explained by a single dimension. He posited that several behavioral tendencies were implicated, and that each one explained a relatively small proportion of variance; thus, cognitive complexity could not be labeled as a unitary personality trait (Vannoy, 1965).The reliability and validity of cognitive complexity and more specifically the Role Construct Repertory Test have been undergone further scrutiny. Menasco and Curry (1978) observed moderate internal consistency and found significant correlations between this measure and other measures of cognitive functioning, including ACT scores.

Schneier (1979) observed suitable test-retest reliability for the Rep Test, as well as adequate convergent and discriminant validities. Results also indicated that variables such as sex, year in college, and college major did not influence scores on the measure (Schneier, 1979). One criticism of the Role Construct Repertory Test is that administration and scoring of the traditional measure is cumbersome and time-consuming. Woehr and colleagues (1998) sought to simplify this process by automating the administration and scoring of the test via a computer program. The Computer-Administered Rep Test (CART; Woehr, Miller, & Lane, 1998) provides an alternative to the error-prone paper-and-pencil method of assessing cognitive complexity.

1.7 The Present Study

Bowlerand colleagues (2009) examined the relationship between the FFM and cognitive complexity. Their results indicated that the personalities of participants in low and high cognitive complexity subgroups demonstrated qualitatively different factor structures. The low CC subgroup displayed fewer than five personality factors, while the high CC subgroup demonstrated more than five personality factors. These differences in personality structures highlight potential issues regarding the appropriateness of the Likert-based response format typically used to assess the FFM. The authors suggested that a frequency-based measure of personality may provide one possible solution to this problem.

The proposed study seeks to evaluate the impact of cognitive complexity on the International Personality Item Pool (IPIP) Scale, a frequency-based measure of the FFM. Specifically, it is expected that frequency-based measurement of the FFM will be resilient to the aforementioned influence of cognitive complexity. The response distortion issues surrounding Likert-type scales may be avoided using frequency-based measurement, as the latter may have less susceptibility to rating errors (Edwards &Woehr, 2007).

> *Hypothesis 1: When examining data from all participants, responses to items on the IPIP Scale will demonstrate the traditional five-factor model.*
> *Hypothesis 2: When responding to items on the IPIP Scale, individuals with an average level of cognitive complexity will demonstrate five personality factors.*

Edwards and Woehr (2007) noted that using frequency-based measurement could reduce cognitive load during the actual rating process. Thus, it is expected that the mental faculties necessary to specify frequencies will be less demanding than attempting to establish an average level of an individual’s specific trait, resulting in the emergence of five personality factors regardless of one’s level of cognitive complexity.

> *Hypothesis 3: When responding to items on the IPIP Scale, individuals with a below-average level of cognitive complexity will demonstrate the traditional five-factor model.*
> *Hypothesis 4: When responding to items on the IPIP Scale, individuals with an above-average level of cognitive complexity will demonstrate the traditional five-factor model.*

2. Method

2.1 Participants

Data were collected from 751undergraduate students enrolled in introductory psychology courses at a large public university in the southeastern United States. Participants were either awarded credit towards a research participation requirement or extra credit for their participation. The sample consisted of 64% freshmen, 26% sophomores, 8% juniors, and 2% seniors. The mean age of participants was 18.87 years (s= 2.40, range 17 to 53 years) and 70% were female. Furthermore, 76% of the participants identified themselves as Caucasian, 16% as African American, 2% as Asian American, and 3% as Hispanic, with the remaining 3% preferring not to disclose this information.

2.2 Measures

2.2.1 Five Factor Model

In order to measure the FFM, the 50-Item International Personality Item Pool (IPIP) Scale (Goldberg, 1999) was utilized. However, rather than using the traditional Likert response format (strongly agree to strongly disagree), the frequency-based response format (Edwards &Woehr, 2007) is used. Specifically, participants are asked to indicate how often in the past six months each adjective reflects their behavior in each of three response categories (very inaccurate, neither accurate nor inaccurate, and very accurate). Participants assign percentage values to each response category, and these percentages accumulated to 100% for each adjective.

To create a single score for each item, each percentage response is assigned a weight (very inaccurate = .01, neither accurate nor inaccurate = .03, very accurate = .05), and the weighted percentages are summed, resulting in a score of 1 to 5 for each item. Overall scores for each personality dimension are obtained by combining scores of the 10 items that correspond to each respective factor.

2.2.2 Cognitive Complexity

Cognitive complexity was measured using the Computer Administered Rep Test (CART; Woehr, Miller, & Lane, 1998). Participants are asked to identify 10 individuals that fill 10 role types (yourself, person you dislike, mother, person you would like to help, father, friend of opposite sex, friend of same sex, person with whom you feel most uncomfortable, person in position of authority, person difficult to understand). Participants then rate each of these individuals on 10 bipolar adjective pairs (i.e., outgoing/shy, maladaptive/adjusted, decisive/indecisive, excitable/calm, interested in others/self-absorbed, ill-humored/cheerful, irresponsible/responsible, considerate/inconsiderate, dependent/independent, interesting/dull) using a 7-point scale, yielding a total of 100 ratings. The Johnson (1994) procedure is then used to score the measure by summing the number of matching ratings (2 points each) and the number within one scale value of each other (1 point each). This results in 450 total comparisons, with scores ranging from 230 (high CC) to 900 (low CC).Specifically, Woehr et al. (1998) noted that this method of measuring cognitive complexity is equivalent to the traditional Rep Test.

3. Results

3.1 Cognitive Complexity and Subgrouping

The mean cognitive complexity score was 314.66 ($s = 44.14$), ranging from 287 (high cognitive complexity) to 582 (low cognitive complexity). Cognitive complexity was unrelated to participant ethnicity, $F(4, 740) = 1.39$, $p = .24$, and academic year, $F(3, 746) = 1.06$, $p = .36$. However, there was a significant difference between males and females on cognitive complexity, $F(1, 747) = 9.89$, $p = .002$, $\eta^2 = .01$, although the effect size was small. Additionally, age was unrelated to cognitive complexity scores ($r = .041$, *ns*).

Cut points for the low, average, and high cognitive complexity subgroups were established using quartiles. Bowler and colleagues (2009) utilized 25th percentile cut points to maintain equal sample sizes among the low and high groups to ensure that the mean scores of the groups were significantly different and to avoid any implication that the groups were established to suit the research hypotheses. In the present study, cut points were set at 283.5 and 338.5—the 25th percentile—to determine whether participants qualified as having (1) low levels of cognitive complexity (LCC), (2) average levels of cognitive complexity (ACC), or (3) high levels of cognitive complexity (HCC). As would be expected, these three comparison groups demonstrated significantly different levels of cognitive complexity, $F(2, 748) = 1069.07$, $p < .001$, $\eta^2 = .74$.

3.2 Factor Analyses

A principal components analysis (PCA) was conducted on the entire dataset ($N = 751$) to determine whether the data conformed to the factor structure the measure was intended to demonstrate. Acceptable values were obtained for the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (.83) and the Barlett's Test of Sphericity, $\chi^2(1225, N = 751) = 8972.05$, $p < .001$. The number of extracted factors was based on results from Velicer's Minimum Average Partial (MAP) Test (Velicer 1976; Velicer, Eaton, & Fava, 2000). This method has been shown to be quite accurate with regard to correctly identifying the appropriate number of factors to extract (Zwick & Velicer, 1982). Unlike many of the more common methods for extracting factors (e.g., scree plot, Kaiser criterion), the MAP Test provides a specific value based on the average squared partial correlation reaching a minimum value when components are extracted. Utilizing this method (see O'Connor, 2000), when applied to the entire sample, the MAP Test indicated the presence of seven factors – two additional factors than was suggested by the initial measure development. Thus, with regard to this sample the five-factor model did not appear to provide a good fit for the entire dataset, regardless of cognitive complexity. More specifically, in this specific sample, the measure failed to demonstrate the intended factor structure. Thus, Hypothesis 1 was not supported.

3.2.1ACC Subgroup

A principal components analysis (PCA) was next conducted on the ACC subgroup ($n = 374$). As with the entire sample, acceptable values were obtained for the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (.79) and the Barlett's Test of Sphericity, $\chi^2(1225, N = 374) = 5028.49$, $p < .001$. However, in contrast to the overall sample, when the MAP Test was applied to the correlation matrix of this subgroup, a six-factor solution was suggested. Thus, Hypothesis 2 was not supported, as a six-factor solution was found for the ACC subgroup.

3.2.2LCC Subgroup

A principal components analysis (PCA) was then conducted on the LCC subgroup (*n* = 186). Acceptable values were obtained for the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (.69) and the Barlett's Test of Sphericity, $\chi^2(1225, N = 186) = 3030.28$, $p< .001$. When determining the number of factors to extract, application of the MAP Test to the correlation matrix of this subgroup suggested a five-factor solution. Thus, unlike the MAP analysis of the entire sample, the analysis of the average cognitive complexity subgroup suggested the traditional five factors. Thus, Hypothesis 3 was supported. Specifically, a five-factor solution was noted for the LCC subgroup.

3.2.3HCC Subgroup

Finally, a principal components analysis (PCA) was conducted on the HCC subgroup (*n* = 191). Values were obtained for the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (.67) and the Barlett's Test of Sphericity, $\chi^2(1225, N = 191) = 2878.75$, $p< .001$. Interestingly, when a MAP test was conducted on the correlation matrix of this subsample, a seven-factor solution was suggested. Thus, Hypothesis 4 was not supported. The frequency-based response format did not help to ensure a five-factor model as a seven-factor solution was found for the HCC subgroup.

4. Discussion

The present study sought to examine the impact of cognitive complexity on a five-factor measure featuring a frequency-based response format. Specifically, the universality assumption of the five-factor model challenged by Bowleret al. (2009) was investigated using the frequency-based measure developed by Edwards and Woehr (2007). Overall, our obtained results indicated that cognitive complexity did have an impact on the factor structure of the FFM when a frequency-based response format was used to measure the FFM.

However, it was not necessarily the same impact that it had shown in previous research. Specifically, the overall measure, which was developed to indicate five primary factors, demonstrated seven factors. More importantly, individuals with the lowest levels of cognitive complexity demonstrated five factors, those with average levels of cognitive complexity demonstrated six factors, and those with the highest levels of cognitive complexity demonstrated seven factors. Thus, using the frequency-based response format, individuals who had previously demonstrated fewer than five factors (i.e., those with low levels of cognitive complexity) demonstrated the expected five factors. However, there are two possible interpretations of these results. First, it is possible that this response format helps to hold those with low levels of cognitive complexity to the factors that were initially designed to be evaluated by the measure – in this case, five. Alternately, as the entire sample in this study demonstrated an initial seven-factor solution, it is equally plausible that individuals with low levels of cognitive complexity simply demonstrate less complex personalities.

The overall findings of this study and previous research (e.g., Bowleret al., 2009; in press) appear to have identified a potential truth with regard to the relationship between cognitive complexity and the factor structure of self-report measures of personality. Specifically, individuals with below- and above-average levels of cognitive complexity appear to demonstrate fewer and greater numbers of factors, respectively, than is displayed by individuals with average levels of cognitive complexity. Thus, these two groups appear to demonstrate fundamentally different response structures as a function of their level of cognitive complexity. Stated another way, individuals who are less cognitively complex appear to exhibit less complex personalities, whereas individuals who are more cognitively complex demonstrate more complex personalities. Questions were thus raised regarding the appropriateness of imposing constraints on the personality assessment of individuals within these subgroups. Perhaps there are more appropriate measures of the five factors that are capable of controlling for these differences in cognitive complexity.

4.1 Limitations and Directions for Future Research

The present study was limited by the type of factor analysis that was feasible. Given the large size of the correlation/covariance matrices being analyzed, a confirmatory factor analysis was unrealistic. In practice, a confirmatory factor analysis creates item packets by averaging pairs of highly correlated items. The goal of the present research was to determine whether the factor structure of one's personality differed as a function of discrepancies in the cognitive complexity of the individuals being tested. For this reason, principal components analysis was utilized.

Future research should explore the application of frequency-based measurement to other measures of the five factors. As the FFM is one of the most dominant paradigms in personality research (McCrae, 2009), additional work is needed to improve the psychometric properties of existing measures. The frequency-based response format is known to be less susceptible to deliberate response distortion, which may enhance predictive validity (Fleisher, Edwards, Woehr, & Cullen, 2009).

4.2 Conclusions

The present study sought to examine the impact of cognitive complexity on a five-factor measure with a frequency-based response format developed by Edwards and Woehr (2007). Overall, results indicated that cognitive complexity significantly impacted the factor structure of the FFM even when a frequency-based response format was used. One possible explanation is that the response distortion issues surrounding Likert-type scales are also applicable to frequency-based measurement, despite evidence that the latter may be less conducive to rating errors (Edwards &Woehr, 2007). Nevertheless, frequency-based response formats are a potential substitute for Likert-type response formats, specifically because the dimensions scale reliabilities and convergent validity coefficients are similar for the different response formats. Additionally, the frequency-based response format offers a notable benefit in that it is less susceptible to deliberate response distortion than Likert-type formats, and this consistency information may optimize predictive validity (Fleisher, Edwards, Woehr, & Cullen, 2009).

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