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THE FIVE-FACTOR OBSESSIVE- COMPULSIVE INVENTORY: AN ITEM RESPONSE THEORY ANALYSIS

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THE FIVE-FACTOR OBSESSIVE-COMPULSIVE INVENTORY:
AN ITEM RESPONSE THEORY ANALYSIS

DISSERTATION

A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in Clinical Psychology
in the College of Arts and Sciences
at the University of Kentucky

By

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Lexington, Kentucky

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Lexington, Kentucky

2015

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ABSTRACT OF DISSERTATION

THE FIVE-FACTOR OBSESSIVE-COMPULSIVE INVENTORY: AN ITEM RESPONSE THEORY ANALYSIS

Arguments have been made for dimensional models over categorical for the classification of personality disorder, and for the five-factor model (FFM) in particular. A criticism of the FFM of personality disorder is the absence of measures designed to assess pathological personality. Several measures have been developed based on the FFM to assess the maladaptive personality traits included within existing personality disorders.

One such example is the Five-Factor Obsessive-Compulsive Inventory (FFOCI). The current study applied item response theory analyses (IRT) to test whether scales of the FFOCI are extreme variants of respective FFM facet scales. It was predicted that both the height and slope of the item-response curves would differ for the conscientiousness-based scales, due to the bias towards assessing high conscientiousness as adaptive in general personality inventories (such as Goldberg's International Personality Item Pool; IPIP). Alternatively, the remaining FFOCI scales and their IPIP counterparts were predicted to demonstrate no significant differences in IRCs across theta.

Nine hundred and seventy-two adults each completed the FFOCI and the IPIP, including 377 undergraduate students and 595 participants recruited online. A portion of the results supported the hypotheses, with select exceptions. Fastidiousness and Workaholism demonstrated the expected trends, with the FFOCI providing higher levels of fidelity at the higher end of theta, and the IPIP demonstrating superior coverage at the lower end of theta. Other conscientiousness scales failed to demonstrate the expected differences at a statistically significant level. In this context, the suitability of IRT in the analysis of rationally-derived, polytomous scales is explored.

KEYWORDS: Five-Factor Model, Personality Disorder, Obsessive-Compulsive Personality Disorder, Item-Response Theory, Dimensional Model of Personality Disorder

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DEDICATION

This dissertation is dedicated to my wife, Naomi Presnall-Shvorin;
without her tireless support, it would remain in my brain instead of on the page.

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TABLE OF CONTENTS

Acknowledgments.....	iii
List of Tables.....	v
List of Figures.....	vi
Chapter One: Introduction.....	1
Chapter Two: Conceptual Development.....	3
Chapter Three: Methodology.....	25
Chapter Four: Results.....	32
Chapter Five: Discussion and Conclusions.....	61
References.....	70
Curriculum Vitae.....	86

LIST OF TABLES

Table 1, Diagnostic Criteria for Compulsive Personality Disorder in DSM-III.....	6
Table 2, Diagnostic Criteria for Obsessive-Compulsive Personality Disorder in DSM-III-R.....	7
Table 3, Diagnostic Criteria for Obsessive-Compulsive Personality Disorder in DSM-IV-TR and DSM-5.....	9
Table 4, Proposed Prototype Narrative Diagnosis of OCPD for DSM-5.....	10
Table 5, DSM-5 Section III Hybrid Model for OCPD.....	13
Table 6, Demographic Information for Online and Student Samples.....	26
Table 7, Five-Factor Model Conceptualization of Obsessive-Compulsive Personality Disorder.....	27
Table 8, Descriptive Statistics of FFOCI and IPIP-NEO Scale Scores.....	33
Table 9, Correlations Between IPIP Facets and Associated FFOCI Scales.....	34
Table 10, Results of Exploratory Factor Analyses Addressing the Unidimensionality of Latent Traits.....	36

LIST OF FIGURES

Figure 1, Item Response Curves for FFOCI and IPIP C1: Differences in Alpha.....	37
Figure 2, Item Response Curves for FFOCI and IPIP C1: Differences in Beta.....	38
Figure 3, Item Response Curves for FFOCI and IPIP C2: Differences in Alpha.....	39
Figure 4, Item Response Curves for FFOCI and IPIP C2: Differences in Beta.....	40
Figure 5, Item Response Curves for FFOCI and IPIP C3: Differences in Alpha.....	41
Figure 6, Item Response Curves for FFOCI and IPIP C3: Differences in Beta.....	42
Figure 7, Item Response Curves for FFOCI and IPIP C4: Differences in Alpha.....	43
Figure 8, Item Response Curves for FFOCI and IPIP C4: Differences in Beta.....	44
Figure 9, Item Response Curves for FFOCI and IPIP C5: Differences in Alpha.....	45
Figure 10, Item Response Curves for FFOCI and IPIP C5: Differences in Beta.....	46
Figure 11, Item Response Curves for FFOCI and IPIP C6: Differences in Alpha.....	47
Figure 12, Item Response Curves for FFOCI and IPIP C6: Differences in Beta.....	48
Figure 13, Item Response Curves for FFOCI and IPIP N1: Differences in Alpha.....	49
Figure 14, Item Response Curves for FFOCI and IPIP N1: Differences in Beta.....	50
Figure 15, Item Response Curves for FFOCI and IPIP E1: Differences in Alpha.....	51
Figure 16, Item Response Curves for FFOCI and IPIP E1: Differences in Beta.....	52
Figure 17, Item Response Curves for FFOCI and IPIP E5: Differences in Alpha.....	53
Figure 18, Item Response Curves for FFOCI and IPIP E5: Differences in Beta.....	54
Figure 19, Item Response Curves for FFOCI and IPIP O3: Differences in Alpha.....	55
Figure 20, Item Response Curves for FFOCI and IPIP O3: Differences in Beta.....	56
Figure 21, Item Response Curves for FFOCI and IPIP O4: Differences in Alpha.....	57
Figure 22, Item Response Curves for FFOCI and IPIP O4: Differences in Beta.....	58
Figure 23, Item Response Curves for FFOCI and IPIP O6: Differences in Alpha.....	59
Figure 24, Item Response Curves for FFOCI and IPIP O6: Differences in Beta.....	60

Chapter 1 Introduction

The diagnostic label of obsessive–compulsive personality disorder (OCPD) describes an enduring assemblage of maladaptive characteristics such as perfectionism, workaholism, rigidity, constricted emotional expression, and a preoccupation with order and details. Obsessive-compulsive personality disorder is estimated to be highly prevalent across settings. In fact, several studies have suggested that it might be the most common personality disorder (PD) in the general population (Coid, Yang, Tyrer, Roberts, & Ullrich, 2006; Lindal & Stefansson, 2009; Mattia & Zimmerman, 2001; Torgersen, 2009), and is perhaps associated with increased direct and indirect costs of mental health care (Soeteman, Hakkaart-Van Roijen, Verheul, and Busschbach, 2008). Among individuals with an Axis I disorder, estimates of OCPD comorbidity range from 10.2% (alcohol abuse) to 37.5% (panic disorder without agoraphobia) (Grant, Mooney, & Kushner, 2012). Additionally, OCPD may be associated with increased rates of relapse in individuals with remitted major depressive disorder (Grilo et al, 2010), and appears to be significantly associated with completed suicide in men (Schneider et al., 2006).

In sum, the prevalence of OCPD is substantial; its impact on both the individual and society are extensive. Given these consequences, it is reasonable to place importance on the assessment and diagnosis of OCPD. This dissertation first provides an overview of the historical conceptualization of OCPD, briefly addressing the proposals for diagnosing OCPD in the latest edition of the American Psychiatric Association’s (APA) Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013). Consistent with one component of the DSM-5, the introduction explores the assessment of OCPD from a dimensional trait perspective, specifically the five-factor model (FFM; McCrae & Costa,

2003). This provides the context for the empirical component of this dissertation, which was to examine the performance of the Five-Factor Obsessive Personality Inventory (FFOCI; Samuel, Riddell, Lynam, Miller, & Widiger, 2012) using item response theory (IRT) analyses.

Chapter 2 Conceptual Development

Historical Background

Freud (1908/1959) originally described the “anal-retentive” type, so named for its supposed bowel-focused origins. This anal-retentive type comprised three traits: obstinacy, parsimony, and orderliness (Ingram, 1961; Pollak, 1979). Obstinacy describes an oppositional and autonomous tendency that may be expressed through rigidity of thought, critical style, and controlling behavior. Authority figures or those in positions of power were said to elicit increased feelings of anal-retentive obstinacy, but might not be the ultimate recipients of the resulting hostility. Parsimony consists of frugality, stinginess, and avarice in regards to resources. In addition to money and physical possessions which may be hoarded, time is to be prudently allotted to avoid waste, and emotional expression may be withheld rather than casually dispersed. Anal-retentive orderliness encompasses varied aspects of life, from personal cleanliness to professional reliability. Tasks are guided by routine, precision, and fastidiousness. Such orderliness exceeds reasonable responsibility, with an exertion of effort that is disproportionate to the significance of the anticipated outcome.

The three traits of obstinacy, parsimony, and orderliness can be said to have formed the basis of even the current OCPD conceptualizations (Costa, Samuels, Bagby, Daffin, & Norton, 2005; Emmelkamp, 1982; Emmelkamp & Kamphuis, 2007; Pfohl & Blum, 1995), which can be traced through the incarnations of the APA Diagnostic and Statistical Manual of Mental Disorders (DSM). In the first Diagnostic and Statistical Manual: Mental Disorders (DSM-I; APA, 1952), compulsive personality was included in the personality disorders section. Personality disorders were “characterized by developmental defects or pathological trends in the personality structure, with minimal

subjective anxiety, and little or no sense of distress,” and were generally “manifested by a lifelong pattern of action or behavior, rather than by mental or emotional symptoms” (p. 34). Personality disorders were further divided into three main groups; the compulsive personality was considered to be a “personality trait disturbance” (as opposed to the more deep seated “personality pattern disturbances,” or the socially objectionable “sociopathic personality disturbance”). As was the case for all diagnoses in DSM-I, the compulsive personality was defined by a narrative description. The following five sentences guided these early diagnoses:

Compulsive personality

Such individuals are characterized by chronic, excessive, or obsessive concern with adherence to standards of conscience or of conformity. They may be overinhibited, overconscientious, and may have an inordinate capacity for work. Typically they are rigid and lack a normal capacity for relaxation. While their chronic tension may lead to neurotic illness, this is not an invariable consequence. The reaction may appear as a persistence of an adolescent pattern of behavior, or as a regression from more mature functioning as a result of stress.

(APA, 1952, p. 37)

In the second edition of the DSM, personality disorders were defined as “deeply ingrained maladaptive patterns of behavior that are perceptibly different in quality from psychotic and neurotic symptoms” (APA, 1968, p. 41). Obsessive compulsive personality was alternatively known as anankastic personality (as it is still termed by the World Health Organization), and was briefly described as follows:

Obsessive compulsive personality (Anankastic personality)

This behavior pattern is characterized by excessive concern with conformity and adherence to standards of conscience. Consequently, individuals in this group may be rigid, over-inhibited, over-conscientious, over-dutiful, and unable to relax easily. This disorder may lead to an Obsessive compulsive neurosis (q.v.), from which it must be distinguished.

(APA, 1968, p. 43)

In 1980, the third edition of the DSM appeared radically different than the previous two editions, due to the adoption of the axis system and the influence of the Feighner Criteria (Feighner et al., 1972). Appearing on Axis II, personality disorders were described as “inflexible and maladaptive” personality traits causing “either significant impairment... or subjective distress”; unlike in DSM-I, personality disorders were specifically “not limited to discrete episodes of illness” (APA, 1980, p. 305). The impact of neo-Kraepelinian nosology is observed in the use of discrete criteria (see Table 1). A diagnosis required the presence of four out of the five listed criteria. Additionally, a narrative portion expounded upon the set of categorical criteria, providing examples and illustrations.

The practice of significantly revising the diagnostic criteria for OCPD continued into DSM-III-R (APA, 1987). Moral inflexibility, hoarding, and miserliness appear as additional criteria (see Table 2), resembling more closely the anal-retentive type described in the original psychoanalytic concepts (Widiger, Frances, Spitzer, & Williams, 1988). Perfectionism and preoccupation with detail were parsed into separate criteria, expanding the total number of possible criteria to nine. To receive a diagnosis of OCPD

Table 1

Diagnostic Criteria for Compulsive Personality Disorder in DSM-III

At least four of the following are characteristic of the individual's current and long-term functioning, are not limited to episodes of illness, and cause either significant impairment in social or occupational functioning or subjective distress.

- 1) restricted ability to express warm and tender emotions, e.g., the individual is unduly conventional, serious and formal, and stingy
- 2) perfectionism that interferes with the ability to grasp "the big picture," e.g., preoccupation with trivial details, rules, order, organization, schedules, and lists
- 3) insistence that others submit to his or her way of doing things, and lack of awareness of the feelings elicited by this behavior, e.g., a husband stubbornly insists his wife complete errands for him regardless of her plans
- 4) excessive devotion to work and productivity to the exclusion of pleasure and the value of interpersonal relationships
- 5) indecisiveness: decision-making is either avoided, postponed, or protracted, perhaps because of an inordinate fear of making a mistake, e.g., the individual cannot get assignments done on time because of ruminating about priorities

Note: DSM-III = Diagnostic and Statistical Manual of Mental Disorders (3rd ed.; American Psychiatric Association, 1980).

Table 2

Diagnostic Criteria for Obsessive-Compulsive Personality Disorder in DSM-III-R

A pervasive pattern of perfectionism and inflexibility, beginning by early adulthood and present in a variety of contexts, as indicated by at least *five* of the following:

- 1) perfectionism that interferes with task completion, e.g., inability to complete a project because own overly strict standards are not met
- 2) preoccupation with details, rules, lists, order, organization, or schedules to the extent that the major point of the activity is lost
- 3) unreasonable insistence that others submit to exactly his or her way of doing things, **or** unreasonable reluctance to allow others to do things because of the conviction that they will not do them correctly
- 4) excessive devotion to work and productivity to the exclusion of leisure activities and friendships (not accounted for by obvious economic necessity)
- 5) indecisiveness: decision making is either avoided, postponed, or protracted, e.g., the person cannot get assignments done on time because of ruminating about priorities (do not include if indecisiveness is due to excessive need for advice or reassurance from others)
- 6) overconscientiousness, scrupulousness, and inflexibility about matters of morality, ethics, or values (not accounted for by cultural or religious identification)
- 7) restricted expression of affection
- 8) lack of generosity in giving time, money, or gifts when no personal gain is likely to result
- 9) inability to discard worn-out or worthless objects even when they have no sentimental value

Note: DSM-III-R = Diagnostic and Statistical Manual of Mental Disorders (3th ed., revision; American Psychiatric Association, 1987).

using the DSM-IV (APA, 1994) and DSM-IV-TR (APA, 2000; no changes were to the criterion sets for DSM-IV-TR), four of eight possible criteria must be present (see Table 3). A comparison of these criteria to those included in DSM-III-R reveals that two criteria had been deleted (restricted emotional expression and indecisiveness), and the rather broad criterion of rigidity and stubbornness was added. These revisions were based on a systematic review of the clinical literature concerning OCPD (Pfohl & Blum, 1995).

DSM-5 OCPD

The DSM-5 personality disorders work group proposed a radical shift in personality disorder classification (Skodol, 2012). As indicated by Skodol (2010) in the first posting of the on the DSM-5 website, "the work group recommends a major reconceptualization of personality psychopathology" ("Reformulation of personality disorders in DSM-5," para. 1). Of primary interest to this dissertation, the work group initially proposed to replace the specific and explicit criterion sets of DSM-IV-TR with a prototype narrative description (Skodol, 2012). Table 4 provides the proposed OCPD narrative description.

The prototype narrative may not have represented a substantial deviation in content from the DSM-IV-TR criterion set, although it was based largely on prior research with the prototype narrative descriptions developed by Westen, Shedler, and Bradley (2006). More importantly, perhaps, it did represent a radical shift in the method of diagnosis, abandoning the specific and explicit criterion sets for a more subjective clinical interpretation of a client's personality. As suggested by Westen et al. (2006) "Clinicians could make a complete Axis II diagnosis in [just] 1 or 2 minutes" (p. 855) because they would no longer have to assess systematically each of the individual

Table 3

Diagnostic Criteria for Obsessive-Compulsive Personality Disorder in DSM-IV-TR and DSM-5

A pervasive pattern of preoccupation with orderliness, perfectionism and mental and interpersonal control, at the expense of flexibility, openness and efficiency, beginning in early adulthood and present in a variety of contexts, as indicated by four (or more) of the following:

- 1) Is preoccupied with details, rules, lists, order, organization, or schedules to the extent that the major point of the activity is lost.
- 2) Shows a perfectionism that interferes with task completion (e.g. is unable to complete a project because his or her own overly strict standards are not met).
- 3) Is excessively devoted to work and productivity to the exclusion of leisure activities and friendships (not accounted for by obvious economic necessity).
- 4) Is overconscientious, scrupulous and inflexible about matters of morality, ethics or values (not accounted for by cultural or religious identification).
- 5) Is unable to discard worn-out or worthless objects even when they have no sentimental value.
- 6) Is reluctant to delegate tasks or to work with others unless they submit to exactly his or her way of doings.
- 7) Adopt a miserly spending style towards both self and others; money is viewed as something to be hoarded for future catastrophes.
- 8) Shows rigidity and stubbornness.

Note: DSM-IV = Diagnostic and Statistical Manual of Mental Disorders (4th ed., text revision; American Psychiatric Association, 2000). DSM-5 = Diagnostic and Statistical Manual of Mental Disorders (5th ed.; American Psychiatric Association, 2013).

Table 4

Proposed Prototype Narrative Diagnosis of OCPD for DSM-5

Individuals who match this personality disorder type are ruled by their need for order, precision, and perfection. Activities are conducted in super-methodical and overly detailed ways. They have intense concerns with time, punctuality, schedules, and rules. Affected individuals exhibit an overdeveloped sense of duty and obligation, and a need to try to complete all tasks thoroughly and meticulously. The need to try to do things perfectly may result in a paralysis of indecision, as the pros and cons of alternatives are weighed, such that important tasks may not ever be completed. Tasks, problems, and people are approached rigidly, and there is limited capacity to adapt to changing demands or circumstances. For the most part, strong emotions – both positive (e.g., love) and negative (e.g., anger) – are not consciously experienced or expressed. At times, however, the individual may show significant insecurity, lack of self confidence, and anxiety subsequent to guilt or shame over real or perceived deficiencies or failures. Additionally, individuals with this type are controlling of others, competitive with them, and critical of them. They are conflicted about authority (e.g., they may feel they must submit to it or rebel against it), prone to get into power struggles either overtly or covertly, and act self-righteous or moralistic. They are unable to appreciate or understand the ideas, emotions, and behaviors of other people.

Note: American Psychiatric Association (2011)

sentences included within a diagnostic criterion set or within the narrative description.

“Diagnosticians rate the overall similarity or ‘match’ between a patient and the prototype . . . considering the prototype as a whole rather than counting individual symptoms” (Westen et al., 2006, p. 847).

Also proposed for DSM-5 was a 6-domain, 37-trait dimensional trait model (Clark & Krueger, 2010). The six domains were negative emotionality, introversion, antagonism, compulsivity, disinhibition, and schizotypy. Traits from this list could also be used to diagnose OCPD. The traits identified for OCPD were: perfectionism, rigidity, orderliness, and perseveration (from the domain of compulsivity); anxiousness, pessimism, guilt/shame, and low self-esteem (from the domain of negative emotionality); restricted affectivity (from the domain of introversion, albeit also cross-listed in negative affectivity); and oppositionality and manipulativeness (from the domain of antagonism).

It was not clear what the clinician should do if a patient met the diagnostic criterion for OCPD on the basis of the prototype narrative yet did not do so on the basis of the trait list (or vice versa), but it would appear that priority would have been given to the prototype narrative. At the time of the initial proposal, the dimensional trait list was primarily to be used to describe patients who failed to meet the diagnostic criteria for one of the officially recognized personality disorders (Skodol, 2012).

The prototype narrative proposal was eventually abandoned, due in large part to concerns with respect to the empirical support for its reliability and validity (Pilkonis et al., 2011; Widiger, 2011; Zimmerman, 2011). The work group, however, did not return to the specific and explicit criterion sets of DSM-IV-TR. Instead, during the last one to two years of their work, they cobbled together a new format for personality disorder diagnosis, called the

hybrid model (Skodol, 2012), which amalgamated self and interpersonal deficits (Criterion A) obtained from a newly developed model for the definition of personality disorder (Bender et al., 2011), along with four traits from the dimensional trait model (Krueger et al., 2011).

Table 5 provides the final version of this hybrid model for OCPD.

It should be noted that by the time the hybrid model proposal was developed, significant changes had also occurred for the dimensional trait model. On the basis of additional factor analyses, it was reduced from a 6-domain, 37-trait model to a 5-domain, 25-trait model (Krueger et al., 2012). The domain of compulsivity was deleted. Only two of its traits were retained. Rigid perfectionism was shifted to the domain of disinhibition (keyed negatively) and perseveration to the domain of negative affectivity. The dimensional trait model though was now officially aligned with the five-factor model of general personality. As expressed in DSM-5, “these five broad domains are maladaptive variants of the five domains of the extensively validated and replicated personality model known as the ‘Big Five,’ or the Five Factor Model of personality” (APA, 2013, p. 773).

Table 5

DSM-5 Section III Hybrid Model for OCPD

Criterion A: Impairments in self (identity and self-direction) and interpersonal relatedness (empathy and intimacy)

1. Identity: (e.g., sense of self derived primarily from work or productivity)
2. Self-direction (e.g., (e.g., overly conscientious and moralistic attitudes)
3. Empathy (e.g., difficulty understanding the feelings of others)
4. Intimacy (e.g., relationships being secondary to work and productivity)

Criterion B: Maladaptive personality traits

1. Rigid perfectionism\
2. Perseveration
3. Intimacy avoidance
4. Restricted affectivity

Note: American Psychiatric Association (2013)

Five-Factor Model of OCPD

Many of the proposals that have been made for DSM-5 reflect in large part a recognition of the limitations of the DSM-IV-TR categorical approach to personality disorder diagnosis (Skodol, 2012), including an excessive diagnostic comorbidity, insufficient coverage, arbitrary and inconsistent boundaries with normal psychological functioning, and inadequate scientific foundation (Clark, 2007; First et al., 2002; Livesley, 2001; Trull & Durrett, 2005; Widiger & Samuel, 2005; Widiger & Trull, 2007). Of particular concern for this dissertation is the historical use of a single diagnostic term (e.g., obsessive-compulsive personality disorder) to describe a complex construct made up of a heterogeneous constellation of maladaptive personality traits. As discussed previously, these heterogeneous components have historically been added, subtracted, merged, divided, and shuffled, while retaining a virtually identical moniker. Alternatively, researchers have long theorized that personality disorders may be permutations of extreme or maladaptive forms of general personality characteristics rather than categorically distinct syndromes (Blashfield, 1984; Kendell, 1975; Schneider, 1923), which has been supported by behavioral genetic analyses (Jang & Livesley, 1999; Livesley et al., 1998). Among the many possible alternative models of personality disorder (Widiger & Simonsen, 2005) the five-factor model has received considerable support (Lynam & Widiger, 2001; Markon, Krueger, & Watson, 2005; O'Connor, 2002; Saulsman & Page, 2004; Samuel & Widiger, 2008).

The five-factor model (FFM; Costa & McCrae, 2008) is a well-established model of general personality which traces its origins from lexical studies of the English language (Caspi, Roberts, & Shiner, 2005; Deary, Weiss, & Batty, 2011; Goldberg, 1993;

John & Srivastava., 1999). Language can be considered the repository of a society's knowledge and observations; humans develop words to describe significant or complex concepts, such as those related to personality. Examination of the trait descriptors within a lexicon reveals the relative importance of personality constructs, and factor analysis can reveal the structure of those constructs. Five broad domains have been found to effectively account for the variance in general personality structure: neuroticism (emotional instability or negative affectivity), extraversion (urgency or positive affectivity), openness (intellect or unconventionality), agreeableness (versus antagonism), and conscientiousness (constraint). A similar five-factor structure has been replicated and validated in both etic and emic studies across numerous languages and cultures (Allik, 2005; Ashton & Lee, 2001; John, Naumann, & Soto, 2008). The primary assessment tool of the FFM, the Revised NEO Personality Inventory (NEO PI-R; Costa & McCrae, 1992), has introduced six specific sub-factors (or facets) within each domain for a more fine-grained picture of general personality (Costa & McCrae, 1995). For example, the facets of conscientiousness have been termed competence, order, dutifulness, achievement striving, self-discipline, and deliberation. Several alternative measures of the FFM also exist, some of which include facet-level descriptors (de Raad & Perugini, 2002).

Despite the robust body of evidence indicating that personality disorder can be conceptualized as maladaptive variants of the FFM, detractors have noted that the extant FFM measures primarily assess adaptive traits, insufficient for diagnostic purposes (Krueger et al., 2011). To this end, researchers have begun developing and validating scales that are based in the FFM with increased fidelity to the maladaptive aspects of

personality traits present in personality disorder (Widiger, Lynam, Miller, & Oltmanns, 2012). The creation of such measures is a natural progression from theory to application (Lynam, 2013). FFM-based measures have been developed and validated to assess schizotypal (Edmundson, Lynam, Miller, Gore, & Widiger, 2011), histrionic (Tomiatti, Gore, Lynam, Miller, & Widiger, 2012), avoidant (Lynam, Loehr, Miller, & Widiger, 2012), borderline (Mullins-Sweatt et al., 2012), dependent (Gore, Presnall, Miller, Lynam, & Widiger, 2012), narcissistic (Glover, Miller, Lynam, Crego, & Widiger, 2012) personality traits, and, of most importance to this proposal, obsessive-compulsive (Samuel, Riddell, Lynam, Miller, & Widiger, 2012). Each instrument has demonstrated convergent validity with the respective personality disorder and with measures of the FFM. Additionally, they achieve incremental validity over the NEO PI-R (Costa & McCrae, 1992) as well as over personality disorder scales in accounting for variance within other measures of the target personality disorder. Each of the measures is made up of component subscales that can be used individually or in combination to assess for personality disorder from an FFM perspective. Examination for personality disorder at the trait level may provide clinicians and researchers with a better understanding of the etiology, course, correlates, and treatment of each personality disorder, depending on their different components.

More specifically, Samuel et al. (2012) developed 12 brief 10 item scales to assess OCPD maladaptive variants of each respective FFM facet, including Perfectionism (an OCPD variant of FFM competence), Fastidiousness (FFM order), Punctiliousness (FFM dutifulness), Workaholism (FFM achievement-striving), Doggedness (FFM self-discipline), Ruminative Deliberation (FFM deliberation), Detached Coldness (low FFM

warmth), Risk Aversion (low FFM excitement-seeking), Excessive Worry (high FFM anxiousness), Constricted (low FFM openness to feelings), Inflexibility (low FFM openness to actions), and Dogmatism (low FFM openness to values). The FFOCI scales were then validated against the NEO PI-R and other measures of OCPD, including (1) the OCPD scales from the Personality Diagnostic Questionnaire-4 (PDQ-4; Bagby & Farvolden, 2004), the Schedule for Nonadaptive and Adaptive Personality -2 (SNAP; Clark, 1993), the Wisconsin Personality Disorder Inventory (WISPI; Klein et al., 1993), and the Millon Clinical Multiaxial Inventory-III (MCMI-III; Millon, 1994).

In accordance with classical test theory, the measures have shown acceptable reliability and validity. For example, the Cronbach's alpha values for the 12 scales of the Five Factor Obsessive Compulsive Inventory (FFOCI) ranged from .77 to .87 (Samuel et al., 2012). The total FFOCI score correlated from .50 to .70 with traditional measures of OCPD. Most importantly from the perspective of the FFM, each FFOCI subscale correlated significantly with its parent NEO PI-R facet scale, ranging from a low of .45 for FFOCI Perfectionism with NEO PI-R Competence, to a high of .82 for FFOCI Excessive Worry with NEO PI-R Anxiousness. Median convergent validity with the NEO PI-R facet scales was .72. The FFOCI scales also obtained incremental validity over the NEO PI-R in accounting for variance with traditional measures of OCPD, as well as incremental validity over the traditional measures of OCPD. For example, the FFOCI total score explained an additional 21% of the variance over the SNAP in accounting for variance within a combination of the scales from the WISPI, MCMI-III, and PDQ-4. The FFOCI accounted for 43% additional variance in a combination of the scales from the WISPI, SNAP, and MCMI-III after the variance explained by the PDQ-4 was removed.

Crego, Samuel, and Widiger (in press) conducted a further validation of the FFOCI. They further documented that the traits of compulsivity (e.g., perfectionism, fastidiousness, punctiliousness, workaholism, doggedness, and ruminative deliberation) can be understood as maladaptive variants of conscientiousness, replicated across four alternative measures of conscientiousness, including the Dependability scale from the Inventory of Personal Characteristics (Tellegen & Waller, 1987), the Activity scale from the Zuckerman-Kuhlman-Aluja Personality Questionnaire (Aluja, Kuhlman & Zuckerman, 2010), the Conscientiousness scale from the International Personality Item Pool-NEO (Goldberg et al., 2006), and the Orderliness scale from the 5-Dimensional Personality Test (5DPT; van Kampen, 2009). They also compared the FFOCI conceptualization and assessment of OCPD with the DSM-5 dimensional trait model. Although all 12 of the FFOCI scales converged well with their parent FFM domain (i.e., Excessive Worry with neuroticism; Detached Coldness and Risk Aversion with extraversion; Constricted, Inflexibility, and Dogmatism with openness; as well as Perfectionism, Fastidiousness, Punctiliousness, Workaholism, Doggedness, and Ruminative Deliberation with conscientiousness), the DSM-5 Restricted Affectivity and Intimacy Avoidance did not converge with introversion, relating instead to openness and antagonism (rigid perfectionism though did converge well with conscientiousness).

Item Response Theory Analysis

Modern latent trait theory, however, provides researchers with additional tools to examine a measure more thoroughly (Reise & Henson, 2000). The field of psychological assessment has been based largely in classical test theory, but significant advances in psychometrics have led to improved techniques for developing and evaluating assessment

instruments. A primary example of these advances is the application of item response theory analysis (IRT; Embretson & Reise, 2000). IRT was first introduced to psychology by way of educational testing, as a method of developing more efficient measures of educational attainment or achievement. Only recently has it been applied to personality assessment, primarily to develop computerized adaptive testing (CAT) versions of existing measures. For example, Reise and Henson (2000) reported on a CAT version of the NEO Personality Inventory–Revised (NEO PI-R; Costa & McCrae, 1992) using a real-data simulation, and Simms and Clark (2005) developed and validated an IRT-based CAT for the SNAP (Clark, 1993).

Another potentially useful extension of IRT to the study of personality and personality disorder is its ability to compare the amount of information that existing instruments provide at different levels of a latent trait (Reise & Henson, 2000). Items typically vary in the amount of information they provide across levels of a trait. For example, some items may provide little information at low levels of a trait (e.g., all persons within the lower range provide the same answer), but a great deal of information at higher levels (i.e., persons at the higher levels of the trait respond differentially to the item). Thus, as long as items from different measures can be shown to load on the same latent dimension, they can be compared in terms of the levels of that latent trait where they provide the greatest discrimination. It is this aspect of IRT that could be used to compare where measures of normal and abnormal personality functioning provide more or less information along an underlying latent continuum.

For example, in the FFM of personality disorder, personality disorder traits are hypothesized to be maladaptive and/or extreme variants of normal personality traits. For

example, perfectionism is considered to be a maladaptive and/or extreme variant of FFM competence; rumination is considered to be a maladaptive and/or extreme variant of deliberation (Samuel et al., 2012). To the extent that the traits assessed by the FFOCI are indeed extreme variants of FFM traits, then an IRT analysis should indicate that FFOCI and NEO PI-R items (from a respective facet) involve the same latent trait, but NEO PI-R items provide more information at the lower (normal) range of the trait whereas the FFOCI items provide more information at the higher (abnormal or extreme) range of the trait.

Although IRT has existed conceptually for approximately sixty years (Lord, 1952), it has only recently been considered for use in personality research. As of this writing, very few studies have applied IRT to the topic of the five factor model of personality disorder. Samuel, Simms, Clark, Livesley, and Widiger (2010) examined whether measures of pathological personality traits provide more information at the higher (abnormal) range of the latent trait than do measures of normal personality. Using IRT, they compared scales from the Dimensional Assessment of Personality Pathology-Basic Questionnaire (DAPP-BQ; Livesley & Jackson, 2009) and the SNAP (Clark, 1993; Clark, Simms, Wu, & Casillas, in press) with the scales from the NEO PI-R (Costa & McCrae, 1992). Based on prior factor analytic research, they grouped the scales into four domains: emotional instability, antagonism, introversion, and constraint. After confirming unidimensionality, they used Samejima's (1969) graded response model (GRM) to estimate the item parameters for IRT. Rather than summing the item information curves (IICs), which would be influenced by scale length, Samuel et al. averaged the IICs, terming these results "mean information curves." Examination of

these curves found that the measures of normal (NEO PI-R) and abnormal (DAPP-BQ; SNAP) personality shared a latent trait; additionally, the NEO PI-R generally provided more psychometric information at the lower (i.e., adaptive) levels of a given trait, whereas the DAPP-BQ and the SNAP provided more information at the higher (i.e., maladaptive) levels of that trait. This provides support for the dimensional view of personality, indicating that disordered or maladaptive personality exists on a continuum with normal personality. The results from Samuel et al. (2010) could also be used to support the argument that, while general personality measures are tapping into the same construct as personality disorder measures, they may lack adequate discriminatory capacity at the levels required for clinical diagnosis.

Building on these findings, Stepp et al. (2012) compared the Temperament and Character Inventory (TCI; Cloninger, Pryzbeck, Svrakic, & Wetzel, 1994), the SNAP-2 (Clark, Simms, Wu, & Casillas, in press), and the NEO PI-R using IRT. Their purpose was to identify the items that optimally measure each of the underlying common traits – a movement toward the creation of integrated, pantheoretical scales. After performing exploratory factor analysis (EFA) and confirmatory factor analyses (CFA) to determine unidimensionality, they conducted an iterative process of first eliminating items with factor loadings under .35 followed by an additional EFA. Once they had obtained a final item pool for the EFA, the items were submitted to a single-factor CFA. Next, the items were concurrently calibrated using the graded response model (GRM) for the NEO PI-R (because of its Likert-scale response format) and the two-parameter (2PL) model for the TCI and the SNAP-2 (because of their dichotomous format). Finally, they eliminated items with discrimination parameter estimates less than 1.00 and recalibrated the reduced

item pool. Stepp et al. found that the three measures demonstrated differential performance depending on the domain being assessed and the range of information targeted for investigation. They concluded that integrated personality inventories could provide the most information across the personality trait continuum. Most importantly for the purposes of this proposed dissertation, they indicated that the NEO PI-R items occupied the lower (normal) range whereas the TCI and SNAP-2 items occupied the higher (abnormal) range.

Lynam, Loehr, Miller, and Widiger (2011) similarly included IRT analyses in their development of the Five Factor Avoidant Assessment (FFAvA; Lynam, Loehr, Miller, & Widiger, 2012), a measure of avoidant personality disorder traits from the perspective of the FFM. These results were not included in the final publication version of their validation study (Lynam et al., 2012) perhaps in part because the findings were quite mixed. They did find that the FFAvA scales Evaluation Apprehension, Despair, Mortifications, Social Dread, and Risk-Averse provided more information at the higher levels of the latent trait than did the respective NEO PI-R scales but they found little to no difference for FFAvA Overcome, Shrinking, Joylessness, and Timorous.

The reason for the mixed results for the FFAvA may reflect, at least in part, that the FFM of personality disorder suggests that the maladaptive traits assessed by the FFAvA (and the FFOCI) involve “maladaptive *and/or* extreme variants.” One of the striking findings from the IRT studies of Samuel et al. (2010) and Stepp et al. (2012) is the substantial overlap of the normal and abnormal personality scales. The NEO PI-R would account for a bit more information at the lower range and the SNAP would

account for a bit more information at the higher range, but what was most evident was that both instruments overlapped substantially in their coverage.

It is perhaps a bit of a misnomer to suggest that the NEO PI-R is a “normal” personality inventory, in that most of the items assessing high neuroticism and low extraversion (for instance) are assessing maladaptive personality traits. Haigler and Widiger (2001) demonstrated empirically that 98% of the NEO PI-R neuroticism items assess maladaptive personality functioning when keyed in the direction of high neuroticism, as did 90% of the NEO PI-R items keyed in the direction of introversion and 90% of the items keyed in the direction of low conscientiousness. Symptoms of borderline personality disorder, such as self-mutilation and affective instability, may represent more extreme variants of FFM neuroticism, but many of the features of avoidant personality disorder might already be well covered within the range of neuroticism and introversion covered by the NEO PI-R. In these cases, it might be more appropriate to consider the FFAvA scales to be assessing maladaptive variants of FFM traits specific to avoidant personality disorder rather than necessarily more extreme variants.

Walton et al. (2008) conducted IRT analyses of the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996), a self-report measure of psychopathy, along with items selected from the Multidimensional Personality Questionnaire (MPQ; Tellegen, in press). They confirmed that the assessments of both normal and extreme personality shared a common latent trait, as previously indicated by correlational and factor-analytic studies. Contrary to expectations, however, Walton et al. did not demonstrate that the PPI (presumed to specifically measure extreme and maladaptive

traits) provided superior coverage at high levels of the latent trait. Rather, both the MPQ and the PPI were found to provide more information in the moderate range of latent traits than on the extremes. Their findings could again reflect the fact that the primary traits of psychopathy involve antagonism and low conscientiousness, representing again the maladaptive poles of respective MPQ scales in a manner comparable to the NEO PI-R.

In the current study, it was predicted that an IRT analysis would indicate substantial overlap of the normal and abnormal personality scales with little discrimination for trait coverage for the FFOCI scales assessing maladaptive variants of facets of neuroticism (i.e., Excessive Worry), low extraversion (Detached Coldness and Risk Aversion) and low openness (i.e., Constricted, Inflexibility, and Dogmatism), as the items assessing for neuroticism, introversion, and closedness to experience are already largely maladaptive (Haigler & Widiger, 2001). In contrast, it was predicted that the IRT analysis would indicate more information at the higher range for the FFOCI scales assessing maladaptive and extreme variants of high conscientiousness (i.e., Perfectionism, Fastidiousness, Punctiliousness, Workaholism, Doggedness, Ruminative Deliberation), and more information at the lower range for the FFM scales.

Chapter 3 Methodology

Participants

Item response theory analyses require larger sample sizes than traditional correlational studies. When evaluating graded response model (GRM) parameter recovery, adequate sample sizes for estimation of mid-level difficulty parameters range from 250 to 2000, with average root mean squared errors (RMSEs) of about 0.011 for 500 participants (Kim & Cohen, 2002; Reise & Yu, 1990). The current study consisted of 972 adults, ages 18-76, 100 of which selected on the basis of a high OCPD screening score. Oversampling individuals with high OCPD traits ensures that the IRT model has robust information quality at the more extreme levels of the underlying trait. Five hundred ninety-five (595) participants were recruited through Amazon's Mechanical Turk (MTurk, described in further detail below), and were compensated approximately \$1.50 each. This website allows for the collection of data from individuals using an online approach and results in more diverse samples than the typical convenience samples of American undergraduates used in the majority of psychological research (Buhrmester, Kwang, & Gosling, 2011). This sample was combined with a previously collected sample of 377 college students, 100 of whom were preselected on the basis of elevated scores on a measure of OCPD. See Table 6 for a summary of participant demographic information.

Measures

Five-Factor Obsessive-Compulsive Inventory: The Five-Factor Obsessive-Compulsive Inventory (FFOCI; Samuel et al., 2012) is a 120-item self-report inventory developed to assess maladaptive variants of the FFM facets relevant to OCPD (See Table 7). For example, the items corresponding with the FFM facet of deliberation assess more

Table 6

Demographic Information for Online and Student Samples

	<u>Sample</u>	<u>Total reported</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>	<u>SD</u>				
Age	Online	568	18	76	35.01	12.49				
	Student	349	18	51	19.42	2.5				
	Combined	917	18	76	29.08	12.5				
	<u>Sample</u>	<u>Total reported</u>	<u>Male (percent)</u>	<u>Female (percent)</u>						
Gender	Online	593	252 (42.5)	341 (57.5)						
	Student	377	100 (26.5)	277 (73.5)						
	Combined	970	352 (36.3)	618 (63.7)						
	<u>Sample</u>	<u>Total reported</u>	<u>White/ Caucasian</u>	<u>Black/ African American</u>	<u>Asian</u>	<u>NH/PI</u>	<u>NA/AI/ AN</u>	<u>Hispanic/ Latino</u>	<u>Other</u>	
Ethnicity	Online	594	368 (62.0)	46 (7.7)	140 (23.6)	2 (.3)	6 (1.0)	18 (3.0)	14 (2.4)	
	Student	377	305 (80.9)	32 (8.5)	11 (2.9)	3 (.8)	1 (.3)	8 (2.1)	17 (4.5)	
	Combined	971	673 (69.3)	78 (8.0)	151 (15.6)	5 (.5)	7 (.7)	26 (2.7)	31 (3.2)	
	<u>Sample</u>	<u>Total reported</u>	<u>Single</u>	<u>Married</u>	<u>Other</u>					
Marital status	Online	593	262 (44.2)	214 (36.1)	117 (19.7)					
	Student	376	360 (95.7)	7 (1.9)	9 (2.4)					
	Combined	969	622 (64.2)	221 (22.8)	126 (13.0)					
	<u>Sample</u>	<u>Total reported</u>	<u>Yes</u>	<u>No</u>						
Mental health treatment	Online	592	161 (27.2)	431 (72.8)						
	Student	377	48 (12.7)	329 (87.3)						
	Combined	969	209 (21.6)	760 (78.4)						

Note: SD = Standard deviation. NH = Native Hawaiian. PI = Pacific Islander. NA = Native American. AI = American Indian. AN = Alaskan Native.

Table 7

Five-Factor Model Conceptualization of Obsessive-Compulsive Personality Disorder

	<u>High</u>	<u>Low</u>
Neuroticism	Anxiety ^{ab}	Impulsivity ^a
Extraversion		Warmth Excitement-seeking ^{ab}
Openness		Feelings ^a Actions ^{ab} Values ^{ab} Ideas ^a
Conscientiousness	Competence ^{ab} Order ^{ab} Dutifulness ^{ab} Achievement-striving ^{ab} Self-discipline ^{ab} Deliberation ^{ab}	

Note: Traits in gray are not explicitly represented by FFOCI scales (Samuel et al., 2012). ^a Lynam & Widiger (2001); ^b Samuel & Widiger (2004).

specifically the ruminative deliberation that is characteristic of OCPD. Six subscales assess obsessive-compulsive variants of FFM Conscientiousness: Perfectionism (e.g., “People often think I work too long and hard to make things perfect”), Fastidiousness (e.g., “I probably spend more time than is needed organizing and ordering things”), Punctiliousness (e.g., “Some persons suggest I can be excessive in my emphasis on being proper and moral”), Workaholism (e.g., “I get so caught up in my work that I lose time for other things”), Doggedness (e.g., “I have a strong, perhaps at times even excessive, single-minded determination”), and Ruminative Deliberation (e.g., “I often dwell on every possible thing that might go wrong”). Two subscales assess OCPD facets of low Extraversion: Detached Coldness (e.g., “I often come across as formal and reserved”) and Risk Aversion (e.g., “I would always sacrifice fun and thrills for the security of my future”). One subscale assesses an OCPD variant of Neuroticism: Excessive Worry (e.g., “I am often concerned, even nervous, about things going wrong”). Three subscales assess OCPD facets of low Openness to Experience: Constricted (e.g., “Strong emotions are not that important in my life”), Inflexibility (e.g., “I much prefer predictability than exploring the unknown”), and Dogmatism (e.g., “I live my life by a set of tough, unyielding moral principles”). Items are answered on a five-point Likert scale ranging from “strongly disagree” to “strongly agree”. Cronbach’s alpha values for the 12 scales range from .77 to .87. As noted in the introduction, the FFOCI subscales have demonstrated significant convergent and discriminant validity with measures of the FFM as well as with other measures of general personality. Additionally, the FFOCI has demonstrated convergent validity with and incremental validity over other established OCPD measures.

International Personality Item Pool-NEO: The International Personality Item Pool-NEO (IPIP-NEO; Goldberg, 1999; Goldberg et al., 2006) is a 300-item broad personality inventory available in the public domain. The IPIP-NEO is intended to be used freely by researchers and is not copyrighted, although modeled precisely after the copyrighted NEO PI-R (Costa & McCrae, 1992). The IPIP-NEO includes scales that parallel each of the 30 facets scales of the NEO PI-R. Because of the proprietary nature of the NEO PI-R, online data collections present copyright concerns; the IPIP-NEO provides a viable alternative for large-scale, online data collections. Correlations between IPIP-NEO and NEO PI-R facet scales (when corrected for unreliability) range from .86 to .99 (mean = .94). Coefficient alpha values for IPIP-NEO facet scales range from .71 to .88 (mean = .80). Because the IPIP-NEO closely models the NEO PI-R, it contains similar disproportionate representation of adaptivity and maladaptivity within its facet scales as is contained within the NEO PI-R (Simms et al., 2011), and could therefore be expected to perform similarly in IRT analyses.

Procedure

Five hundred ninety-five (595) of the participants completed the FFOCI and the IPIP using Amazon's Mechanical Turk (MTurk). MTurk is an online service where requesters recruit persons to complete tasks for minimal financial compensation (Paolacci, Chandler, & Ipeirotis, 2010) thereby obtaining a more natural voluntary participation. In contrast to traditional methods of data collection (i.e., student subject pools or community samples), MTurk tends to be relatively rapid and inexpensive (Berinsky, Huber, & Lenz, 2012; Rand, 2012). Recent research has also indicated that MTurk provides more demographically diverse samples than is obtained through

traditional college samples. Despite the rapid recruitment and less costly compensation, studies have found that the data quality is equal to, if not more valid, than the data obtained through traditional methods (Buhrmester, Kwang, & Gosling, 2011). This is due in part to the fact that one can confine participation to persons who have previously received high scores for quality of participation.

Analyses

Analyses were conducted using IRTPRO 2.1, an IRT software package distributed by Scientific Software International that incorporates the strengths of the suite of preexisting IRT software programs: Bilog-MG, Multilog, Parscale, and Testfact. IRTPRO produces item- and test-characteristic curve graphs, the latter of which are the method of data presentation for the current study. Exploratory factor analyses were performed with orthogonal Crawford-Ferguson varimax rotation to confirm unidimensionality. For determining goodness of fit, mean factor loadings (λ), RMSEAs, and first-to-second eigenvalue ratios were examined.

Because both the FFOCI and the IPIP-NEO consist of polytomous items, Samejima's (1969) Graded Response Model (GRM) was used to evaluate scale information function. The resulting test-characteristic curves map the amount of information obtained across the latent trait theta (θ) continuum. The height of an information curve (β) indicates the strength of the relationship between participants' responses and their level of the latent trait θ . The discrimination parameter, or slope (α), indicates how well the scale discriminates between participants below and above a given threshold parameter. In this way, the scale characteristic curves produced by the FFOCI

and the IPIP-NEO can be compared graphically as well as statistically, using a one-way ANOVA.

Chapter 4 Results

Nine hundred seventy-two (972) adults, with a mean age of 29.08, completed both the FFOCI and the IPIP-NEO. Of participants reporting demographic data, females comprised 63.7% of the sample, and a majority of participants (69.3%) self-identified their ethnicity as White or Caucasian. A complete summary of the demographic data can be found in Table 6.

FFOCI and IPIP-NEO items were individually scored from zero to four, with possible scale ranges from zero to 40. Across all FFOCI scales, the average scale mean was 20.64 (mean SD = 6.51); the average IPIP scale mean was 21.30 (mean SD = 6.35). Internal consistency measures for both the FFOCI (mean $\alpha = .816$) and IPIP (mean $\alpha = .805$) were acceptable. See Table 8 for a complete summary of descriptive statistics. An examination of the correlations among FFOCI and IPIP scales demonstrates expected levels of convergent validity (see Table 9). The mean correlation of FFOCI scales to the corresponding IPIP facet scales (for example, C1: FFOCI Perfectionism to IPIP Competence) was .569 (median = .587). The mean correlation of FFOCI scales within the same factor (for example, C1 Perfectionism to C2 Fastidiousness) was .580 (median = .623). Mean correlation of IPIP scales within the same factor (for example, C1 Competence to C2 Order) was .530 (median = .556).

Exploratory factor analyses yielded results indicating unidimensionality of the examined latent traits, meeting the required assumption for item response theory analysis. Mean absolute factor loading (λ) was .616, with all loadings equal to or greater than .546. RMSEA values ranged from .062 to .080, indicating acceptable fit. Although many of the scales did not meet the 3:1 ratio of first to second eigenvalues recommended by

Table 8
Descriptive Statistics of FFOCI and IPIP-NEO Scale Scores

Facet	Scale name	Range	Mean	SD	α	Mean CITC
C1	Perfectionism	5 – 40	23.78	6.35	.825	.516
	Competence	11 – 40	26.11	5.34	.769	.445
C2	Fastidiousness	2 – 40	23.97	6.84	.849	.551
	Order	2 – 40	23.84	6.26	.784	.451
C3	Punctiliousness	1 – 40	23.49	6.08	.785	.456
	Dutifulness	12 – 40	26.32	6.48	.816	.484
C4	Workaholism	2 – 40	23.09	6.31	.790	.467
	Achievement-striving	7 – 40	25.09	5.74	.753	.417
C5	Doggedness	2 – 39	23.35	6.72	.839	.534
	Self-discipline	1 – 40	22.83	6.59	.826	.510
C6	Ruminative deliberation	2 – 38	22.88	6.05	.775	.451
	Deliberation	5 – 40	23.68	6.53	.818	.492
E1	Detached coldness	0 – 38	15.70	6.23	.804	.480
	(Low) Warmth	0 – 37	15.43	7.13	.878	.607
E5	Risk aversion	2 – 40	21.15	7.17	.844	.543
	(Low) Excitement-seeking	1 – 39	19.84	7.06	.835	.535
N1	Excessive worry	2 – 40	21.15	7.17	.883	.616
	Anxiety	1 – 39	19.84	7.06	.865	.576
O3	Constricted	0 – 40	14.26	6.76	.848	.546
	(Low) Openness to feelings	0 – 40	14.65	5.86	.779	.446
O4	Inflexibility	0 – 35	17.45	6.08	.766	.435
	(Low) Openness to actions	0 – 36	17.09	5.41	.756	.416
O6	Dogmatism	1 – 38	17.43	6.33	.788	.461
	(Low) Openness to values	0 – 39	20.91	6.77	.779	.448

Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999). SD = Standard deviation. α = Cronbach's alpha. CITC = Corrected Item-Total Correlation.

Table 9
Correlations Between IPIP Facets and Associated FFOCI Scales

<u>IPIP facet</u>	<u>FFOCI scale</u>	<u><i>r</i></u>
N1	Excessive Worry	0.825
E1	Detached Coldness	0.712
E5	Risk Aversion	0.731
O3	Constricted	0.680
O4	Inflexibility	0.608
O6	Dogmatism	0.556
C1	Perfectionism	0.375
C2	Fastidiousness	0.565
C3	Punctiliousness	0.380
C4	Workaholism	0.457
C5	Doggedness	0.645
C6	Ruminative Deliberation	0.291
	mean	0.569
	median	0.587

Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999). *r* = correlation coefficient.

Embretson & Reise (2000), this information considered in combination with factor loadings and RMSEA values provided reasonable evidence to assume unidimensionality.

Table 10 contains the complete results of exploratory factor analyses.

Item response curves for each pair of scales (FFOCI and IPIP) were generated, both statistically and graphically. A visual inspection of the graphical representations (see Figures 1 through 24) demonstrates the similarities across the respective latent traits. ANOVAs conducted across each of the latent traits, for both alpha (α ; slope, or discrimination) and beta (β ; height, or amount of information) values indicated significant differences in respective scale characteristics for 8 of the 12 traits. No significant differences in α or β were found for C5 (Doggedness), E5 (Risk Aversion), O3 (Constricted), or O4 (Inflexibility). For portions of C1 (Perfectionism), C2 (Fastidiousness), C3 (Punctiliousness), C4 (Workaholism) and N1 (Excessive Worry), FFOCI scales demonstrated significantly greater values of α . IPIP scales demonstrated significantly greater values of α for portions of C6 (Ruminative Deliberation), N1 (Excessive Worry), E1 (Detached Coldness), and O6 (Dogmatism). Portions of C2 (Fastidiousness), C6 (Ruminative Deliberation) and N1 (Excessive Worry) demonstrated greater β values for FFOCI scales. Values of β were found to be significantly higher in portions of IPIP scales for C1 (Perfectionism), C2 (Fastidiousness), C3 (Punctiliousness), C4 (Workaholism), C6 (Ruminative Deliberation), E1 (Detached Coldness), and O6 (Dogmatism). Note that the same trait may contain more than one section of significantly different values due to curve inflections.

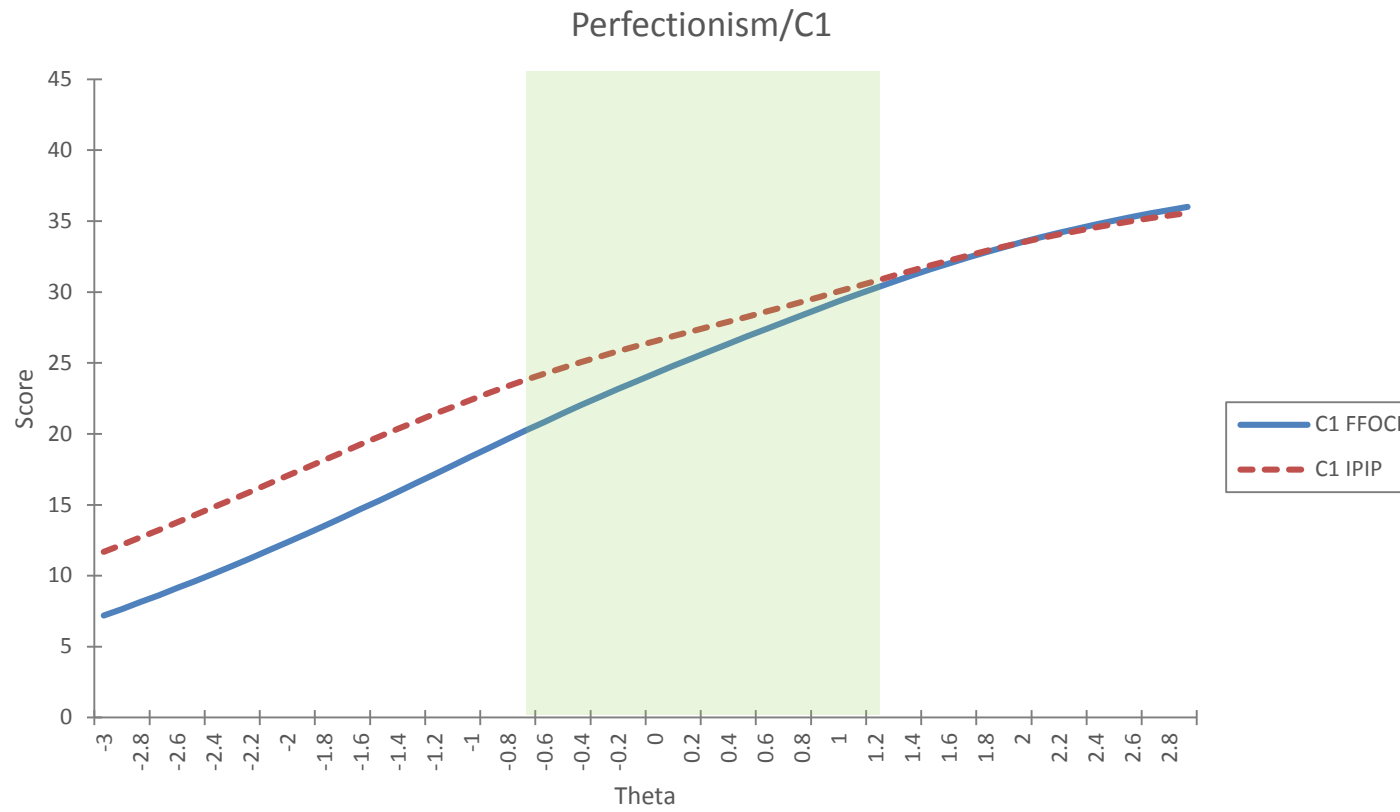
Table 10

Results of Exploratory Factor Analyses Addressing the Unidimensionality of Latent Traits

<u>FFOCI scale name</u>	<u>Associated IPIP facet</u>	<u>Mean factor loading, λ</u>	<u>Mean standard deviation</u>	<u>Mean standard error</u>	<u>RMSEA</u>	<u>Eigenvalue ratio</u>
Perfectionism	C1	0.574	0.181	0.057	0.067	2.18
Fastidiousness	C2	0.669	0.082	0.046	0.080	2.37
Punctiliousness	C3	0.593	0.132	0.057	0.072	1.60
Workaholism	C4	0.600	0.148	0.053	0.064	2.08
Doggedness	C5	0.702	0.107	0.041	0.067	2.60
Ruminative deliberation	C6	0.546	0.243	0.055	0.070	1.41
Excessive worry	N1	0.731	0.151	0.037	0.062	5.69
Detached coldness	E1 (low)	-0.656	0.176	0.046	0.074	3.70
Risk aversion	E5 (low)	-0.610	0.131	0.052	0.068	3.61
Constricted	O3 (low)	-0.617	0.143	0.053	0.069	3.22
Inflexibility	O4 (low)	-0.546	0.143	0.060	0.068	2.72
Dogmatism	O6 (low)	-0.549	0.222	0.055	0.071	2.74

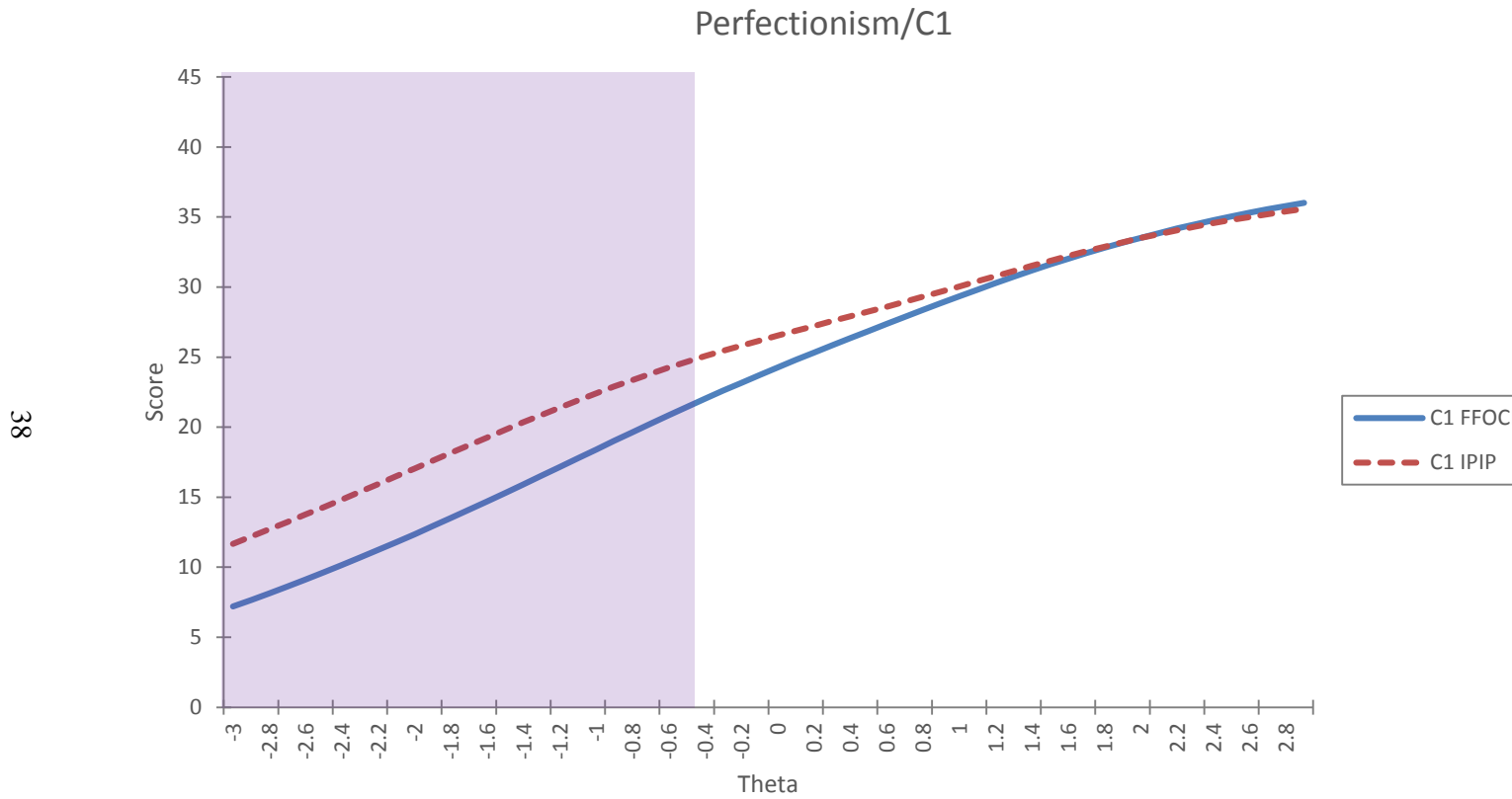
Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999). RMSEA = Root Mean Square Error of Approximation. Eigenvalue ratio = ratio of first and second eigenvalues.

Figure 1
Item Response Curves for FFOCI and IPIP C1: Differences in Alpha



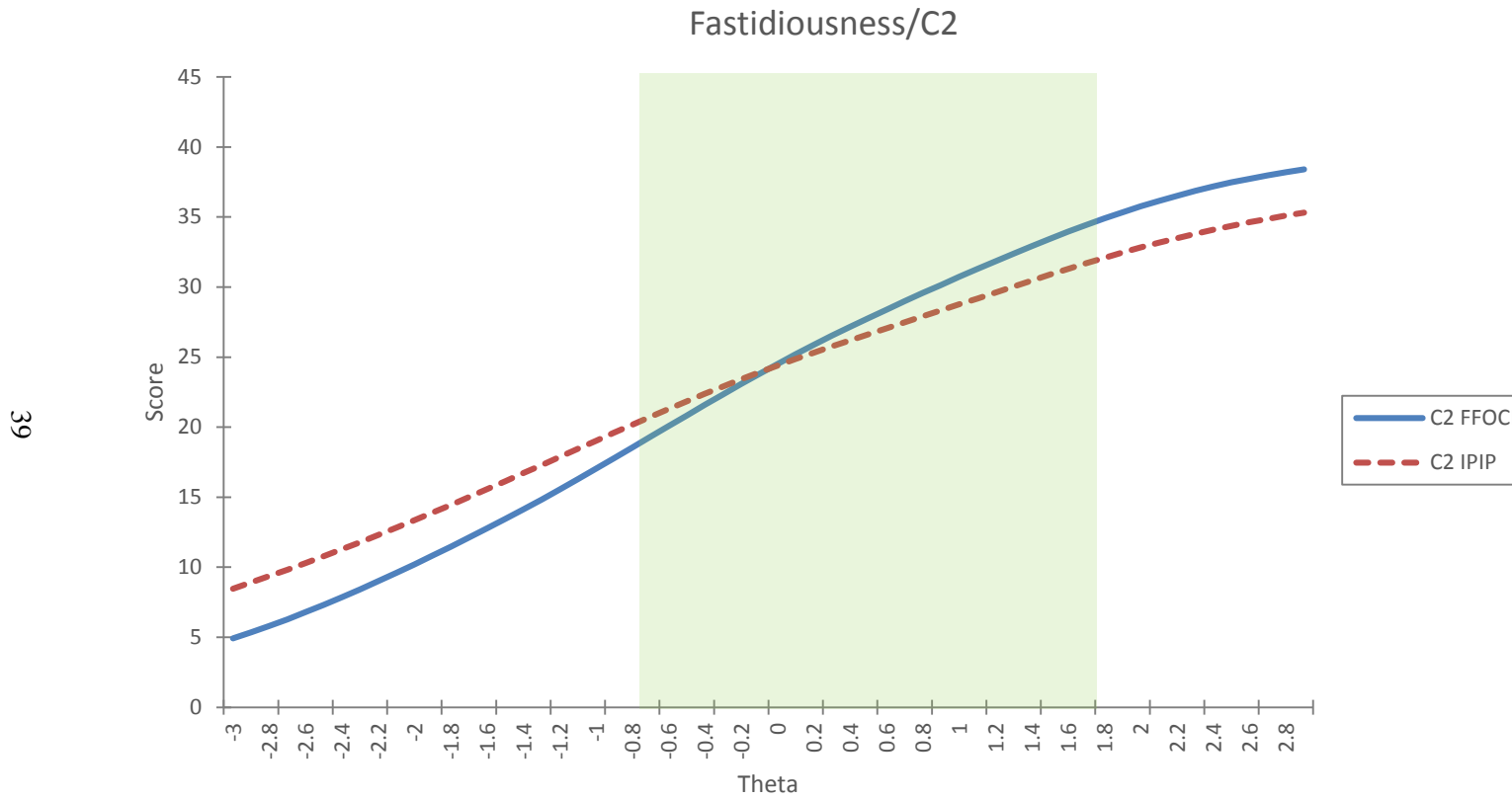
Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

Figure 2
Item Response Curves for FFOCI and IPIP C1: Differences in Beta



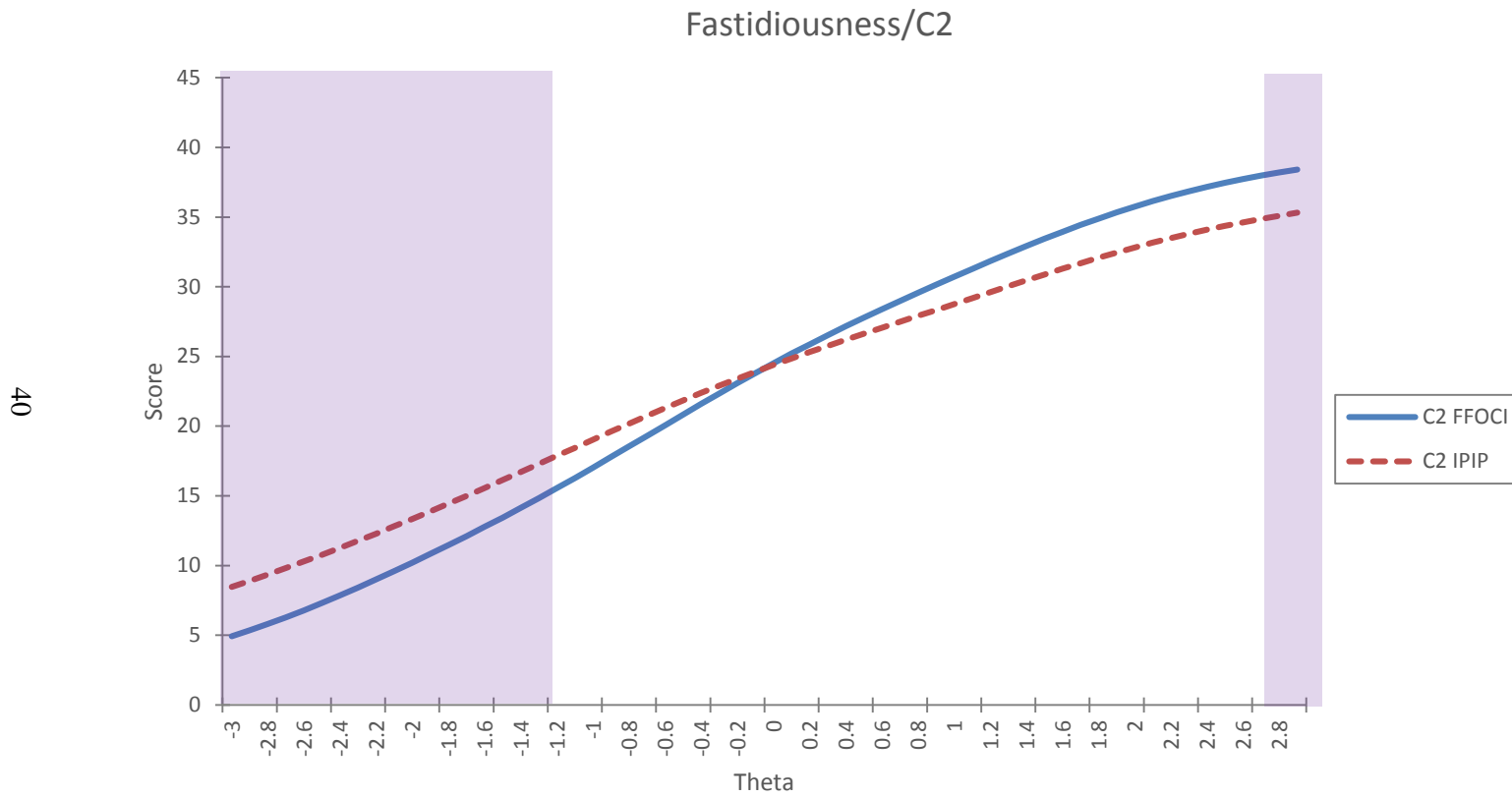
Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999)

Figure 3
Item Response Curves for FFOCI and IPIP C2: Differences in Alpha



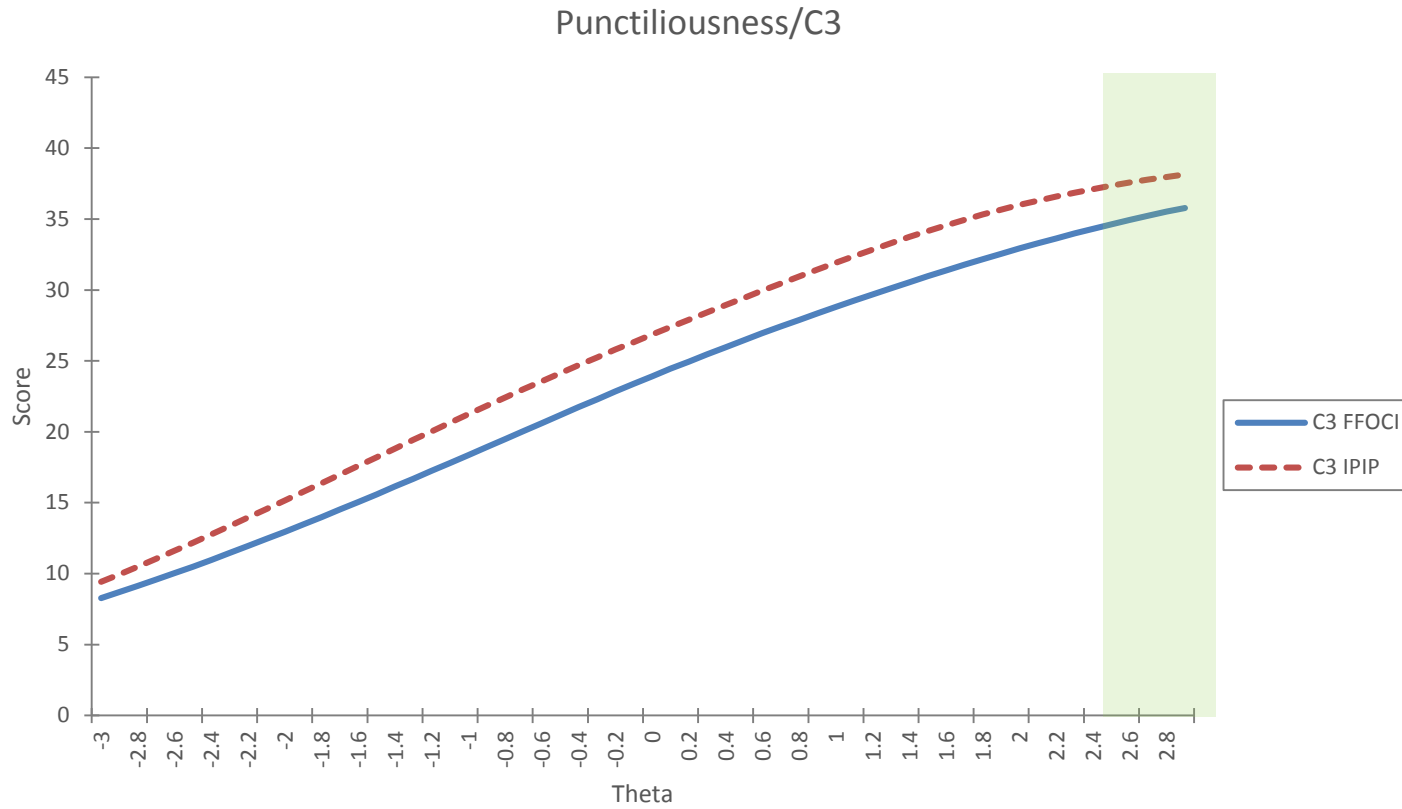
Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

Figure 4
Item Response Curves for FFOCI and IPIP C2: Differences in Beta



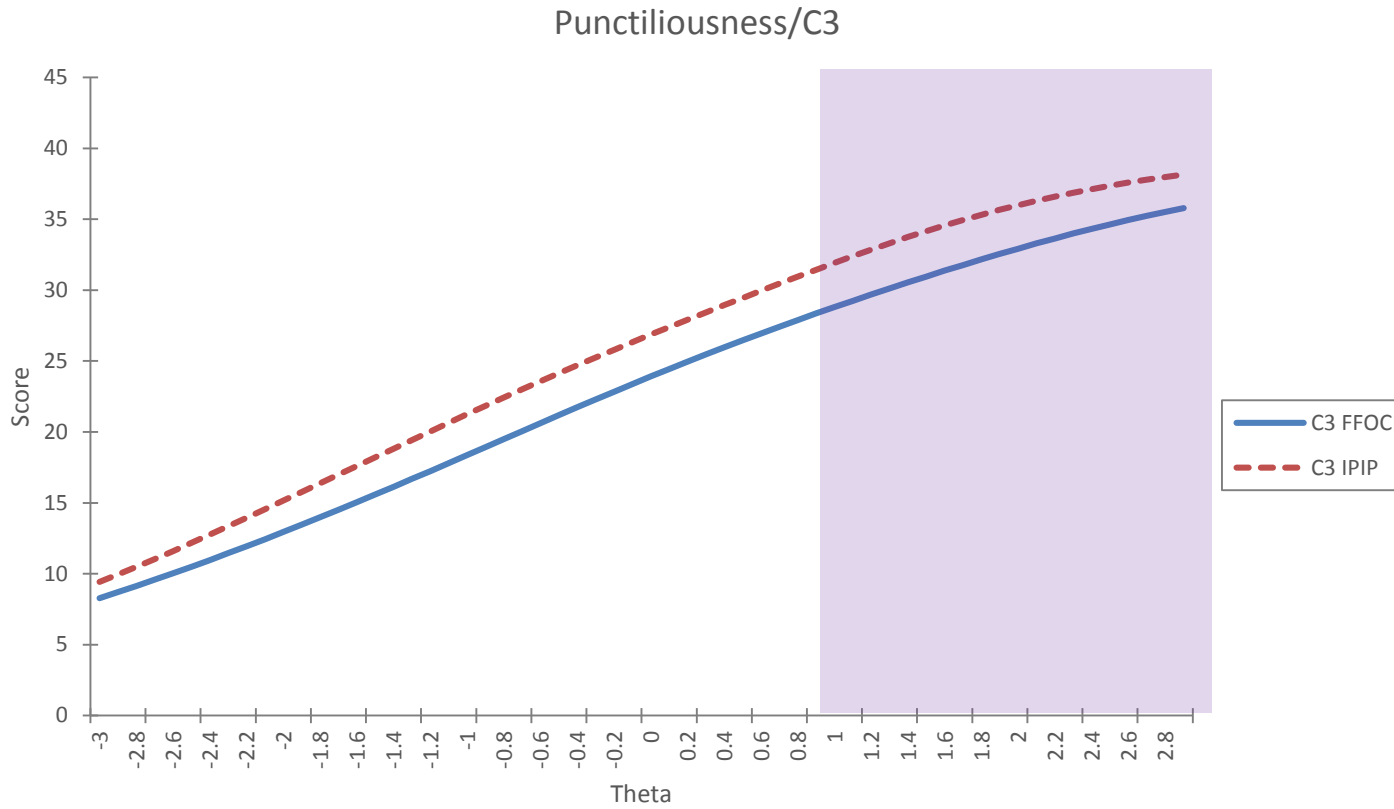
Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

Figure 5
Item Response Curves for FFOCI and IPIP C3: Differences in Alpha



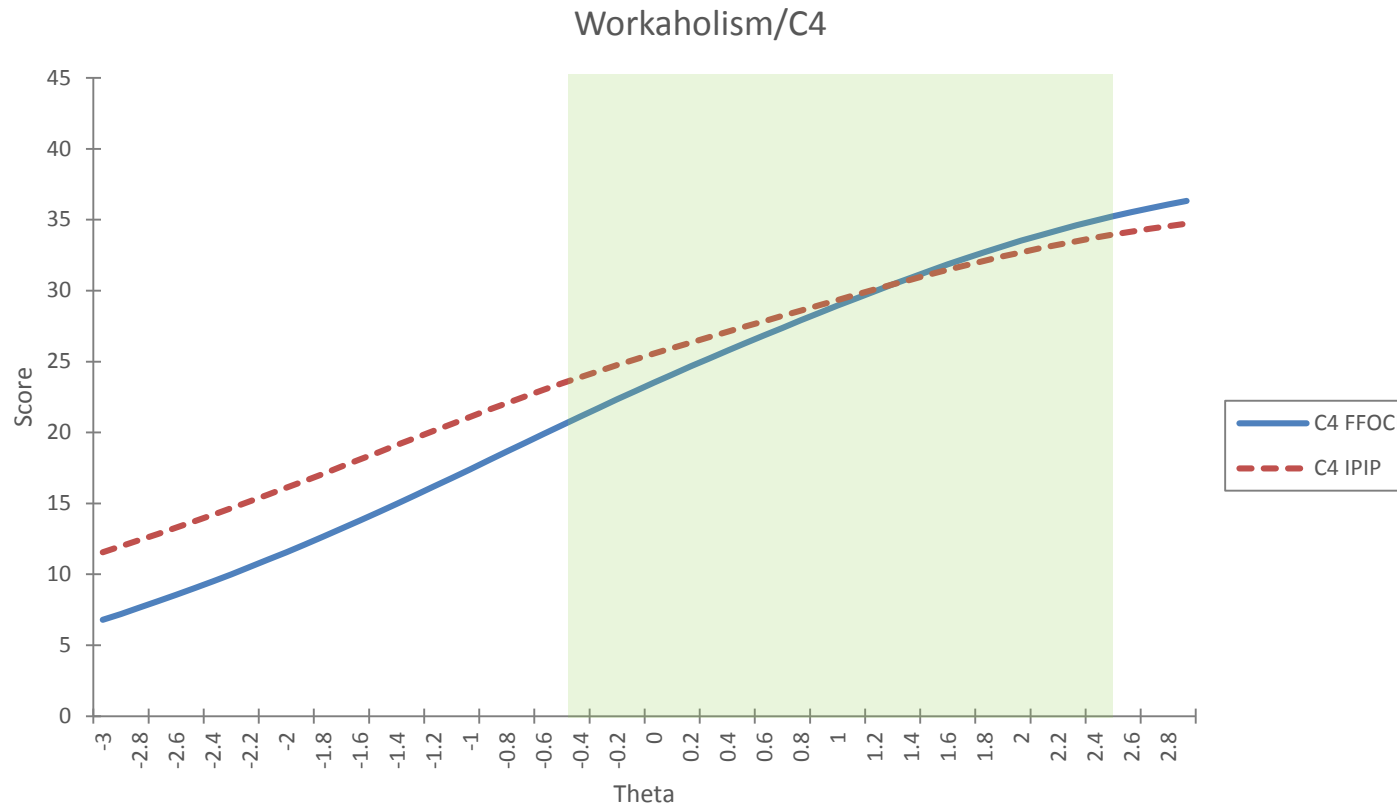
Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

Figure 6
Item Response Curves for FFOCI and IPIP C3: Differences in Beta



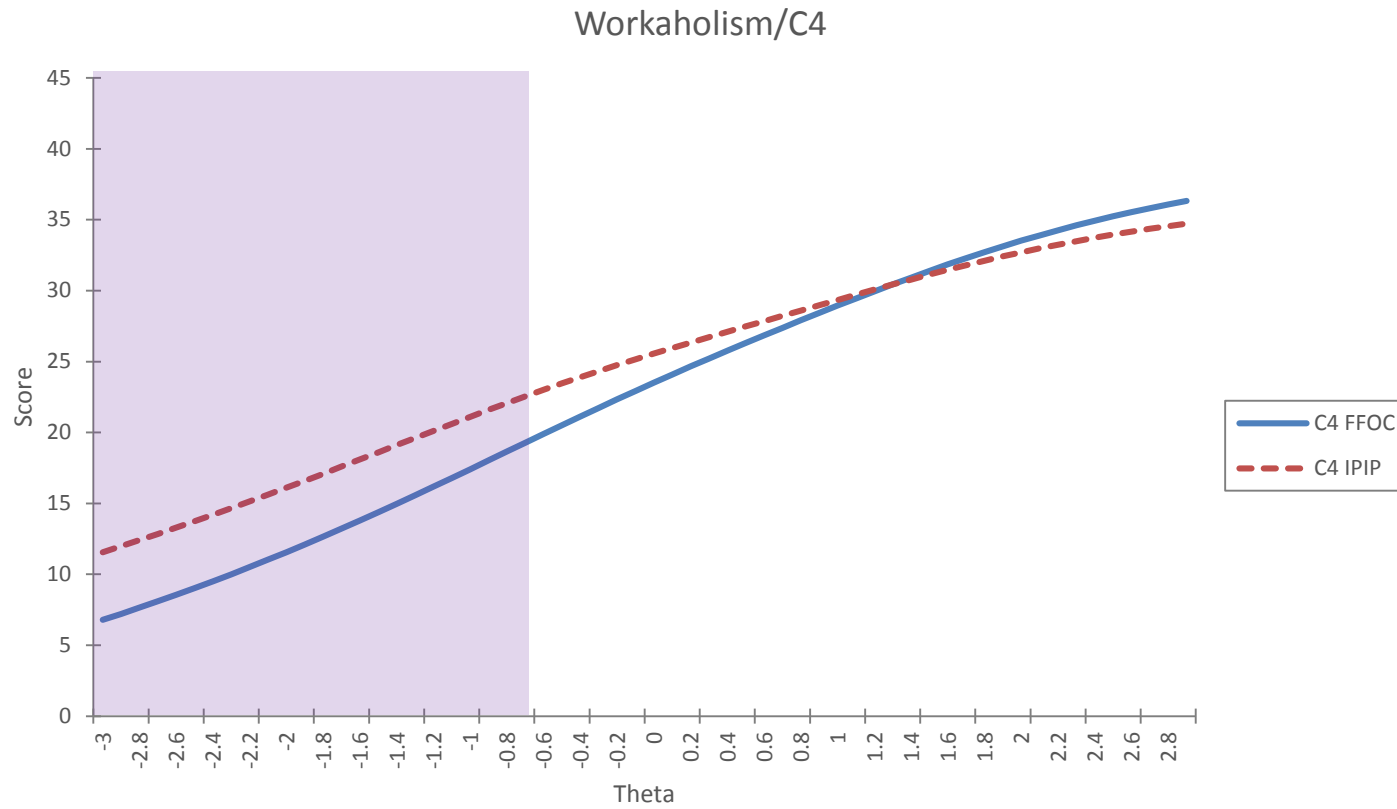
Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

Figure 7
Item Response Curves for FFOCI and IPIP C4: Differences in Alpha



Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

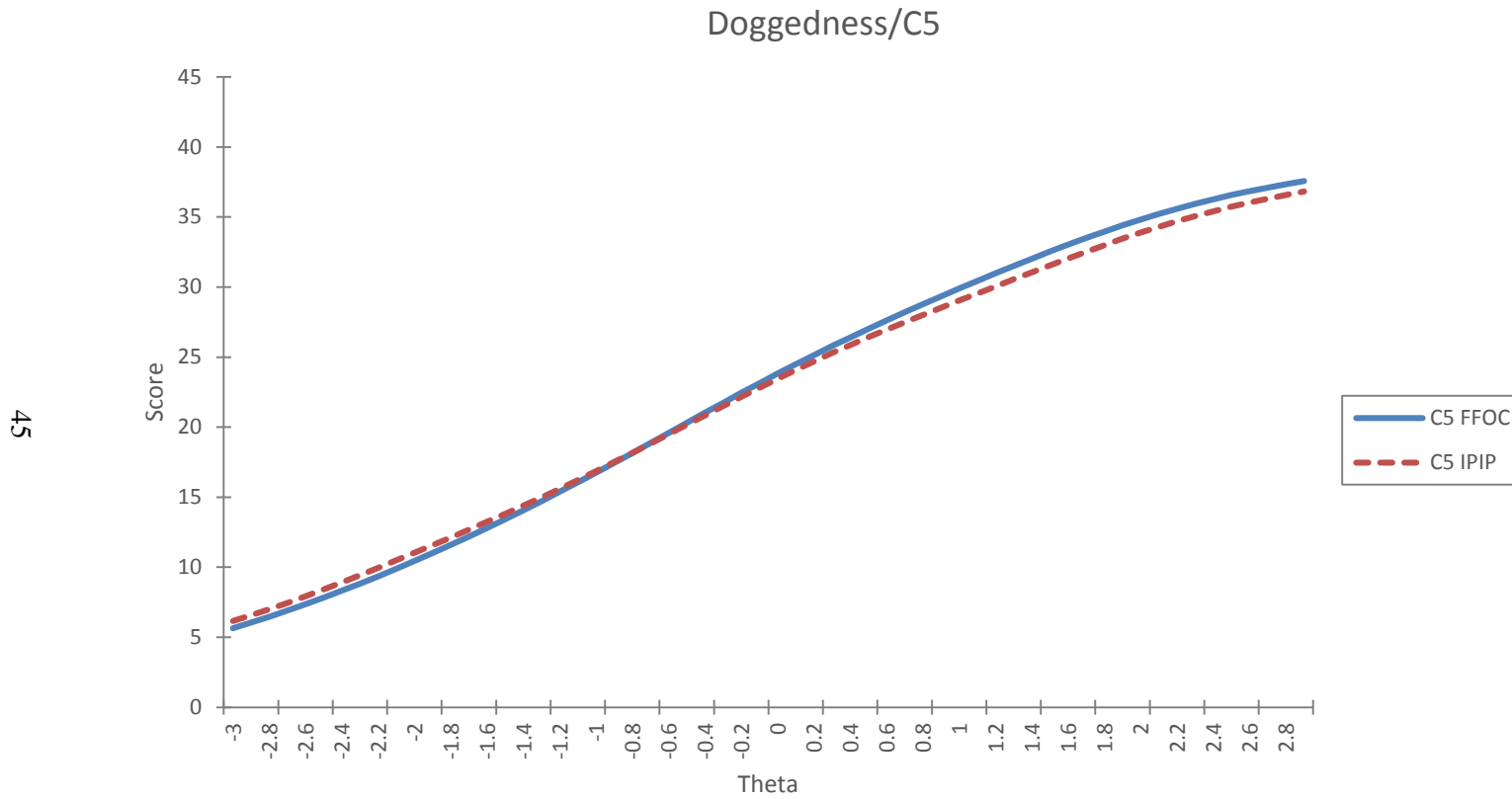
Figure 8
Item Response Curves for FFOCI and IPIP C4: Differences in Beta



44

Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

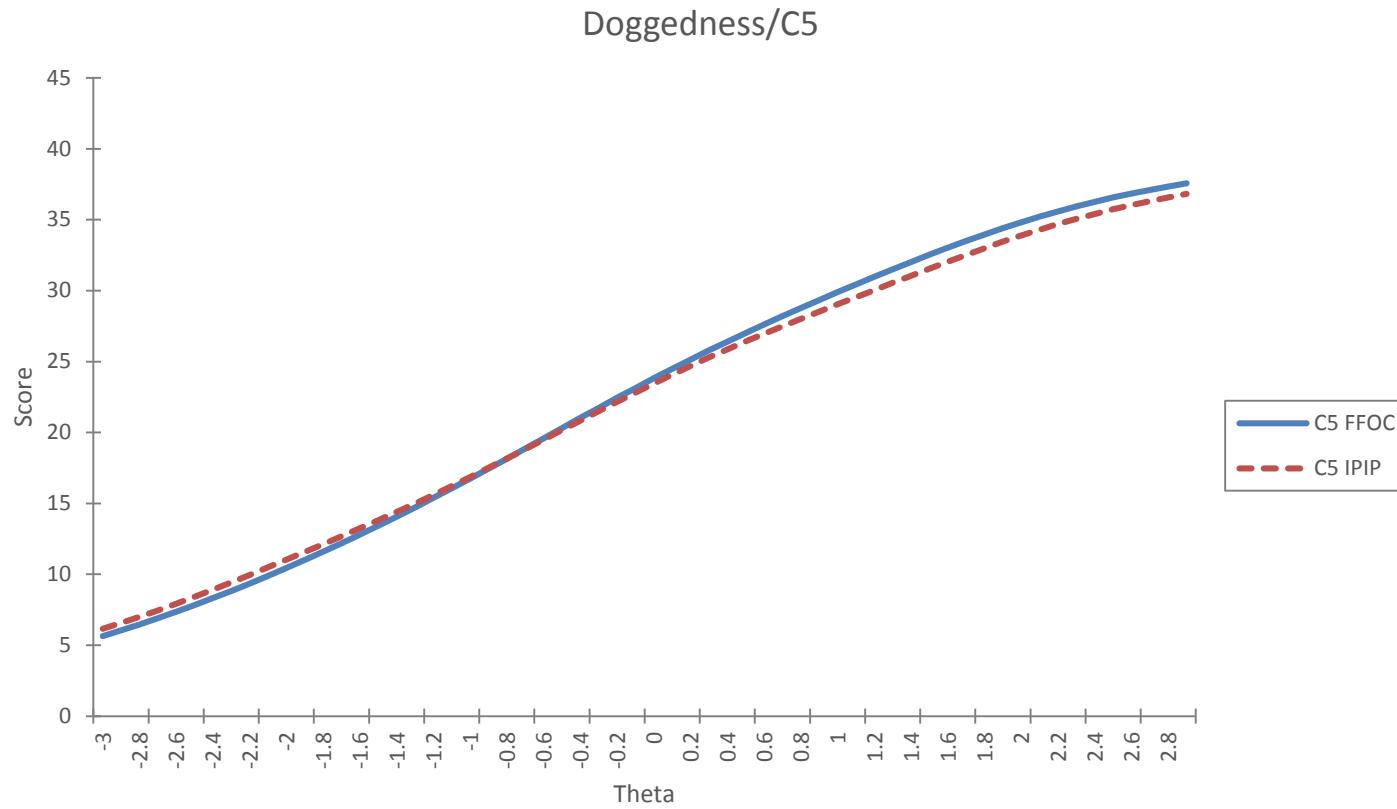
Figure 9
Item Response Curves for FFOCI and IPIP C5: Differences in Alpha



Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

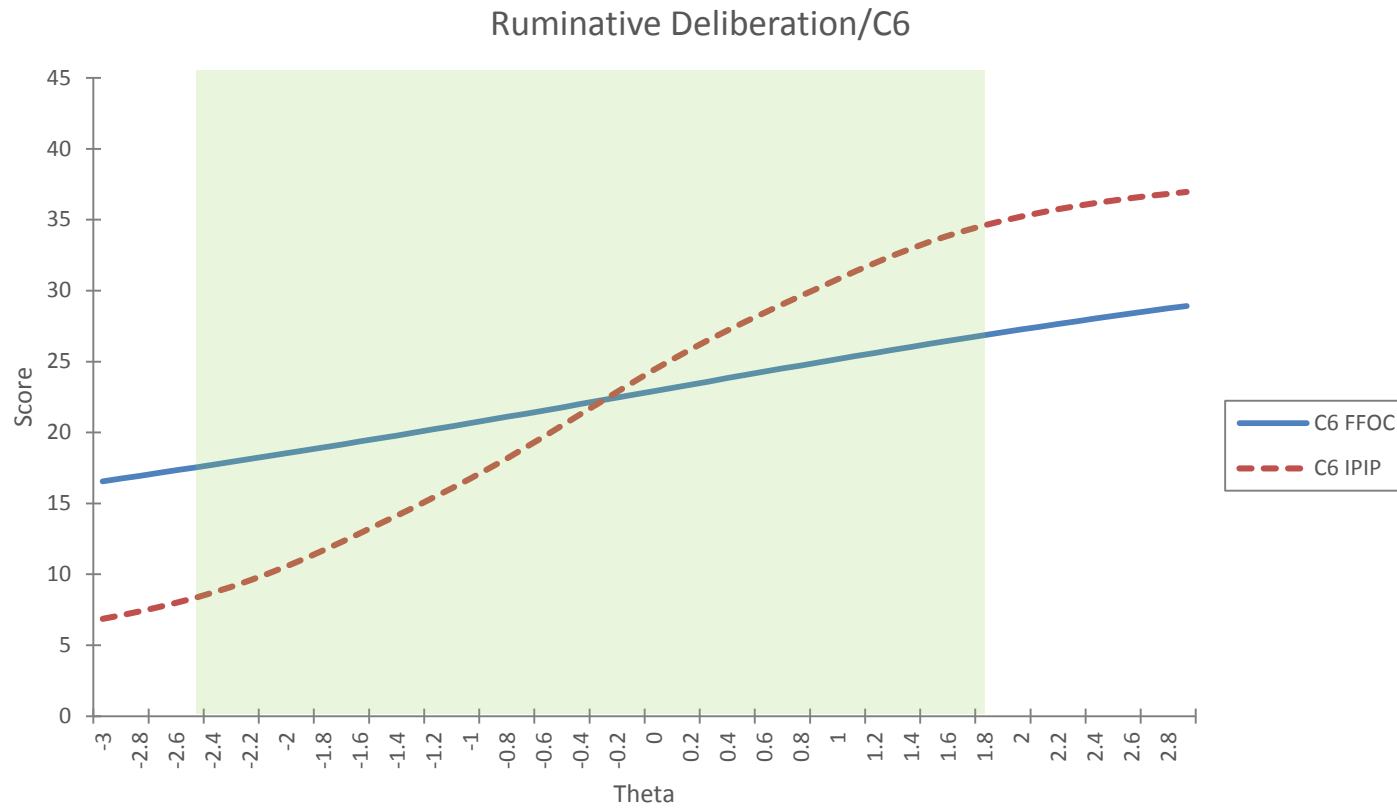
Figure 10

Item Response Curves for FFOCI and IPIP C5: Differences in Beta



Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

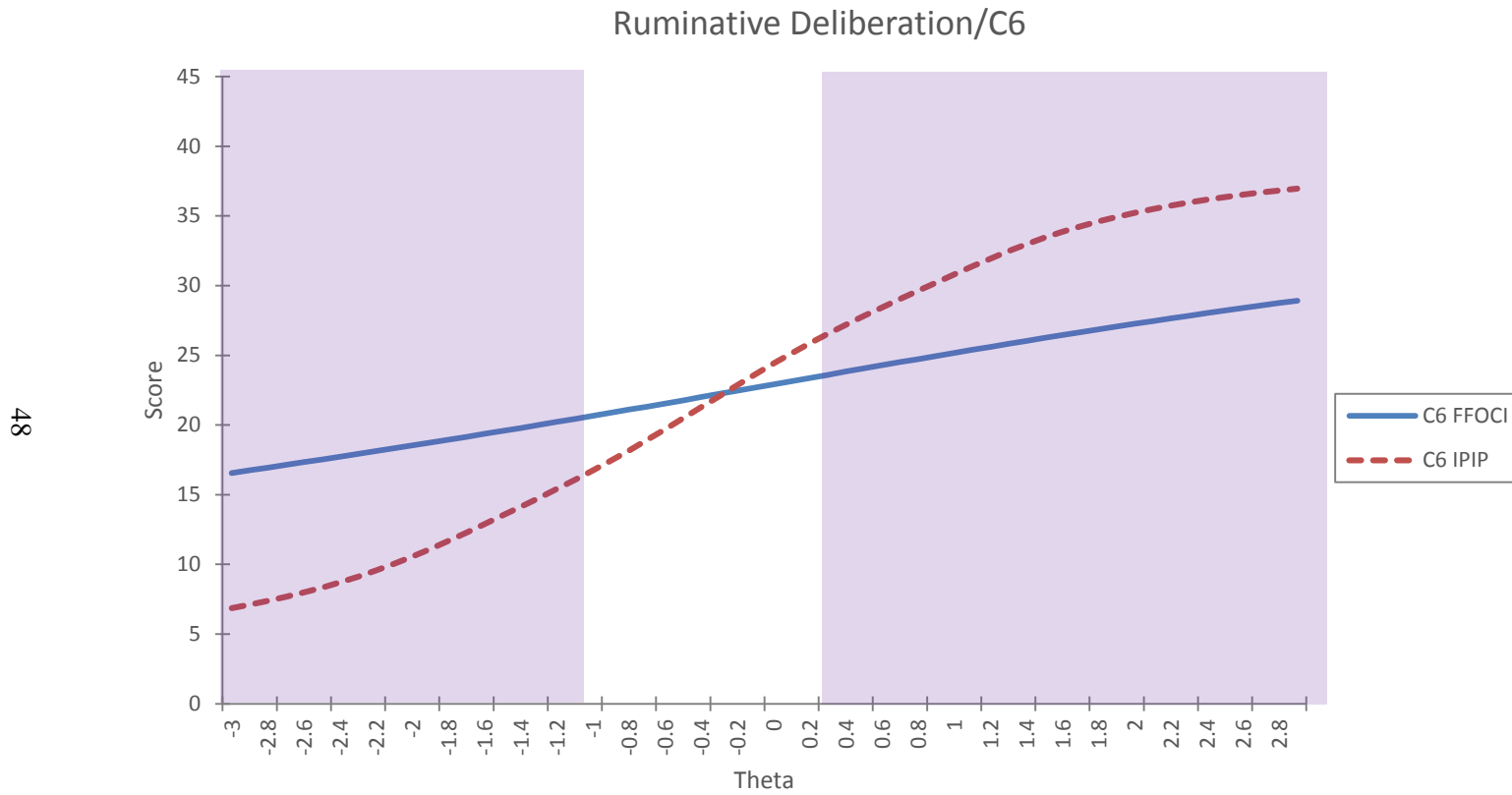
Figure 11
Item Response Curves for FFOCI and IPIP C6: Differences in Alpha



Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

Figure 12

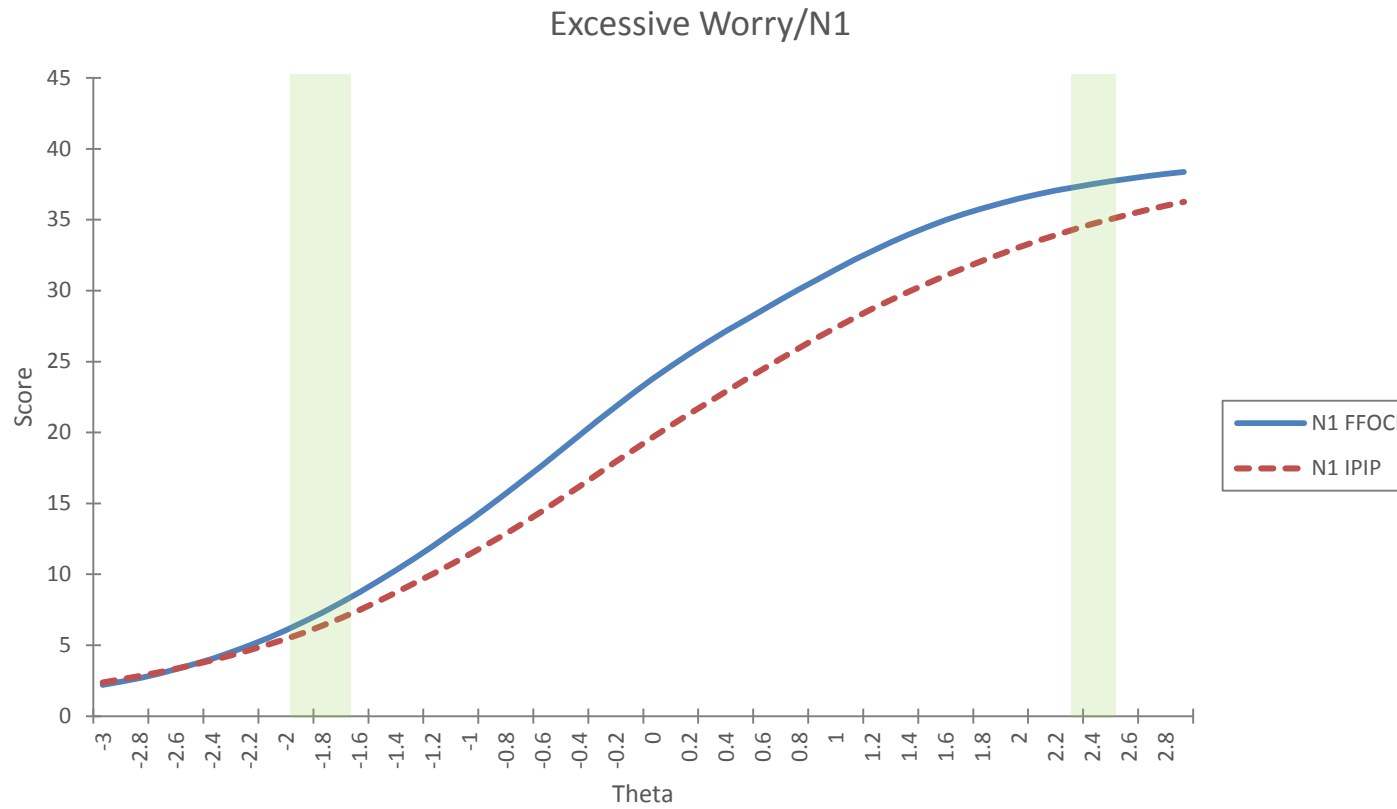
Item Response Curves for FFOCI and IPIP C6: Differences in Beta



Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

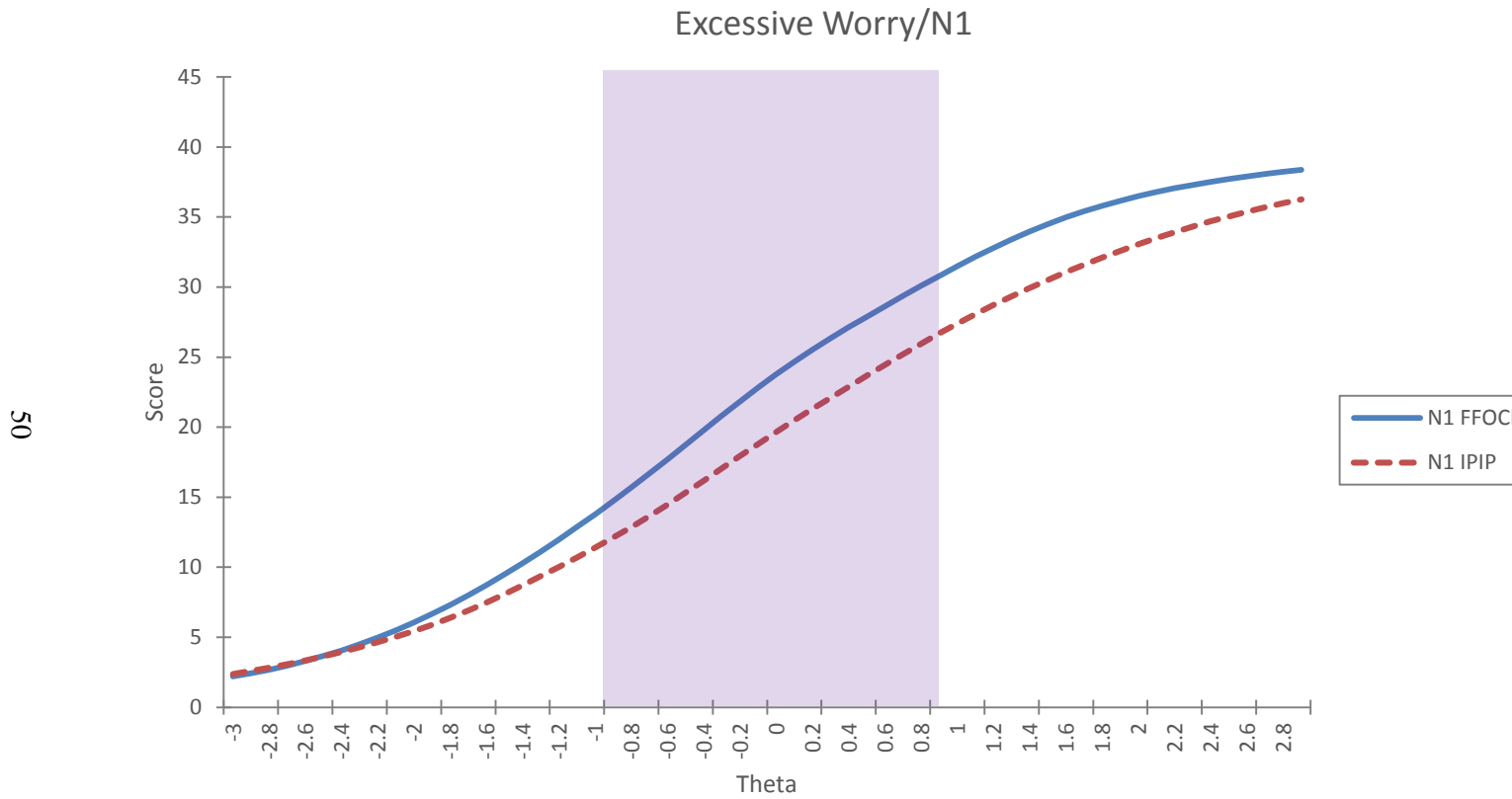
Figure 13

Item Response Curves for FFOCI and IPIP N1: Differences in Alpha



Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

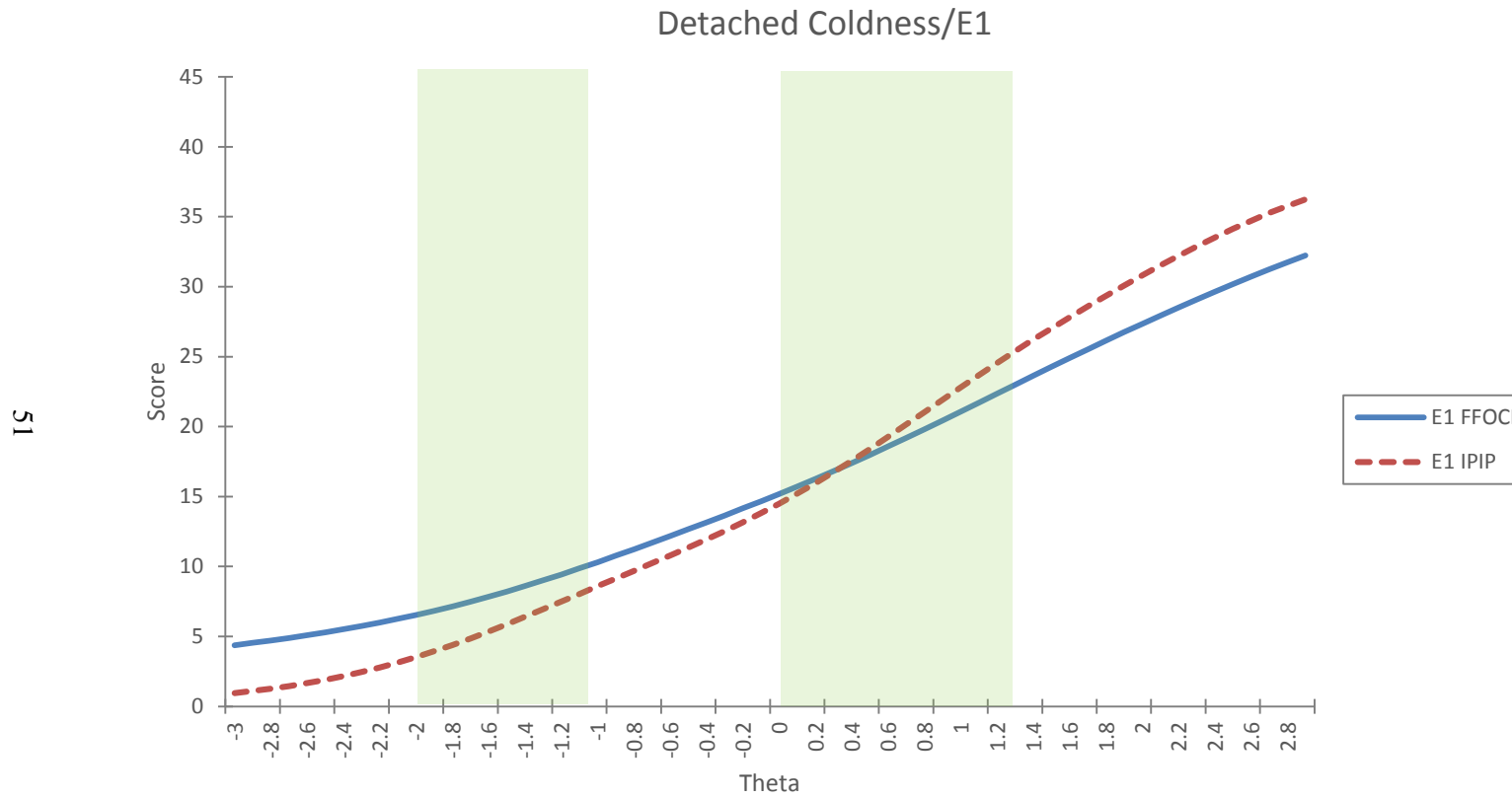
Figure 14
Item Response Curves for FFOCI and IPIP N1: Differences in Beta



Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

Figure 15

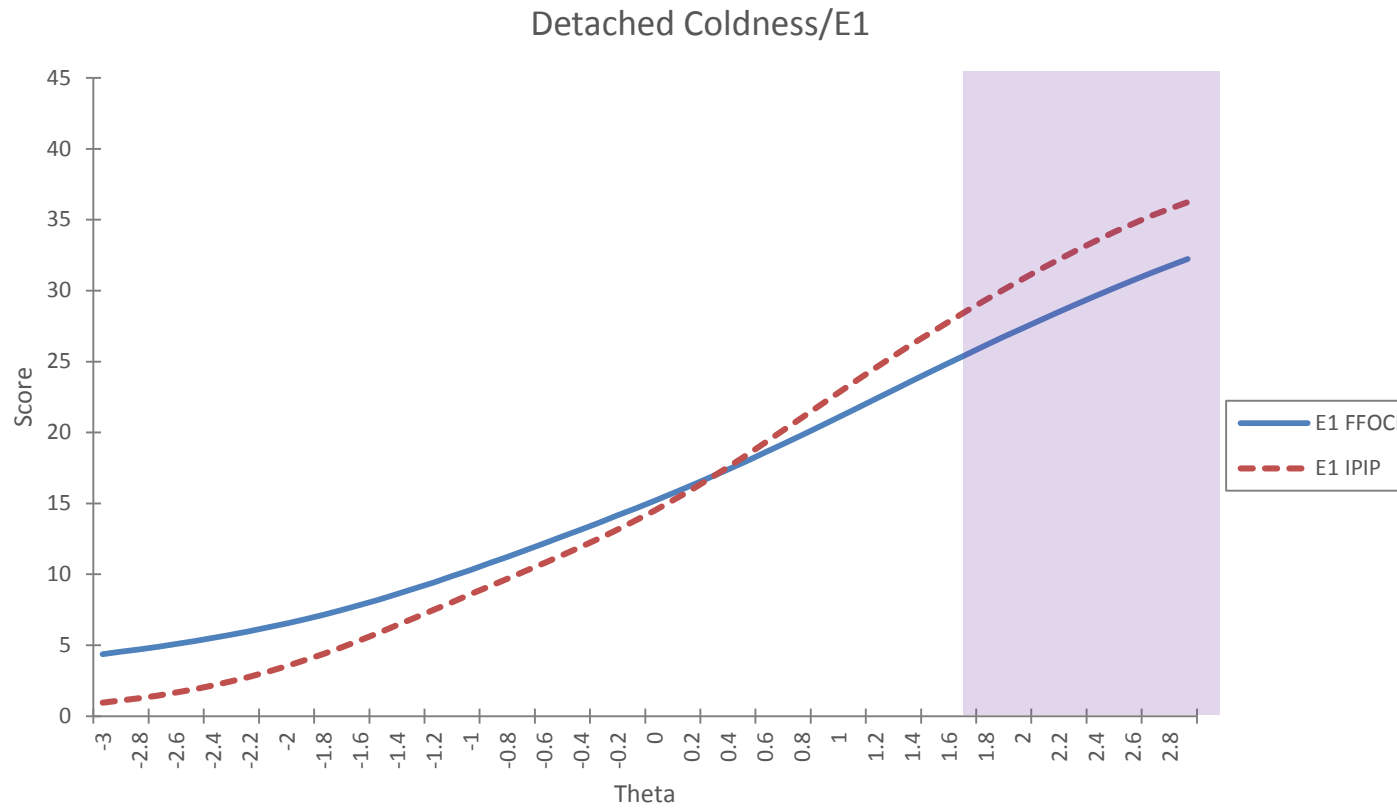
Item Response Curves for FFOCI and IPIP E1: Differences in Alpha



Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

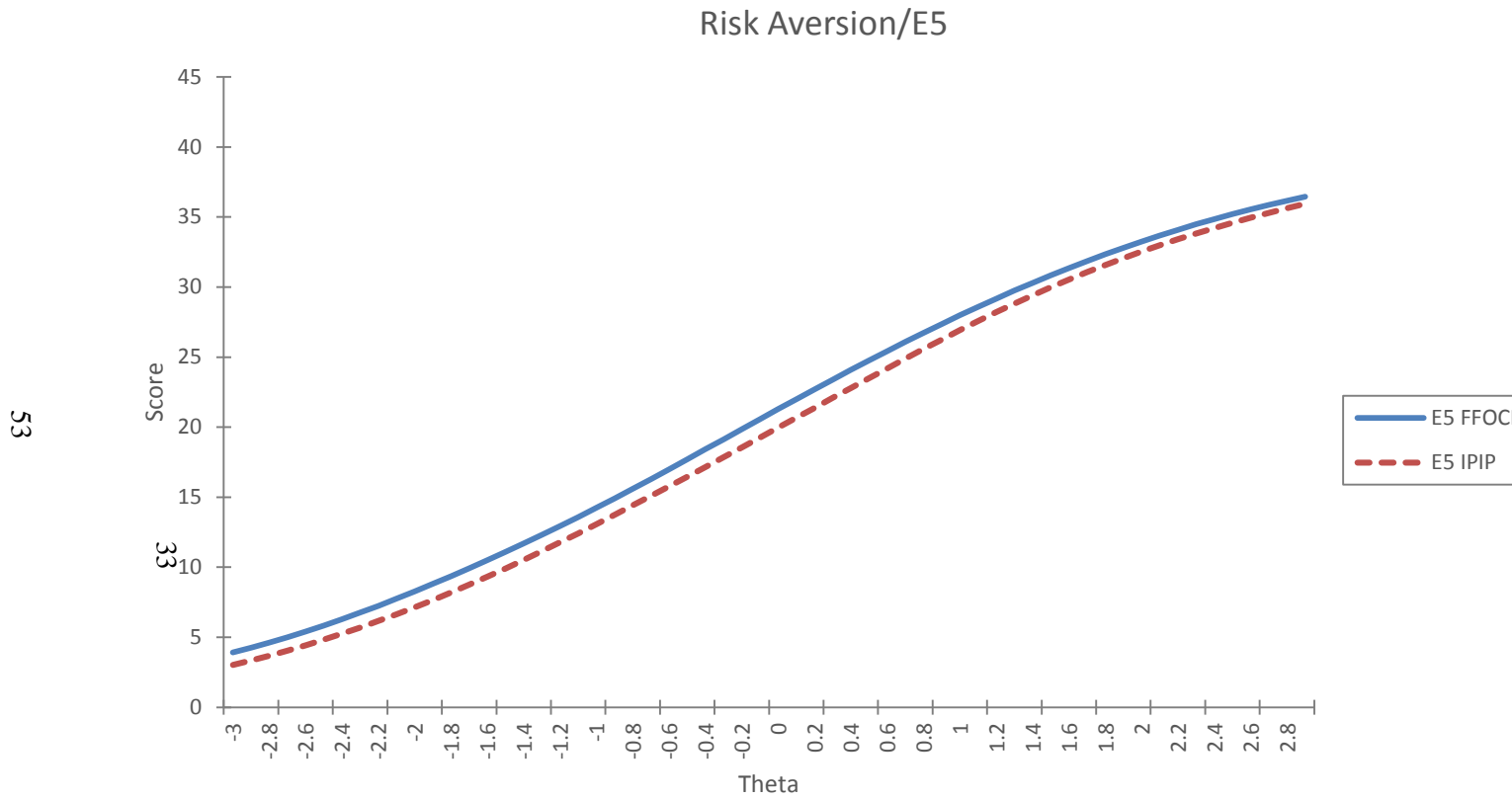
Figure 16

Item Response Curves for FFOCI and IPIP E1: Differences in Beta



Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

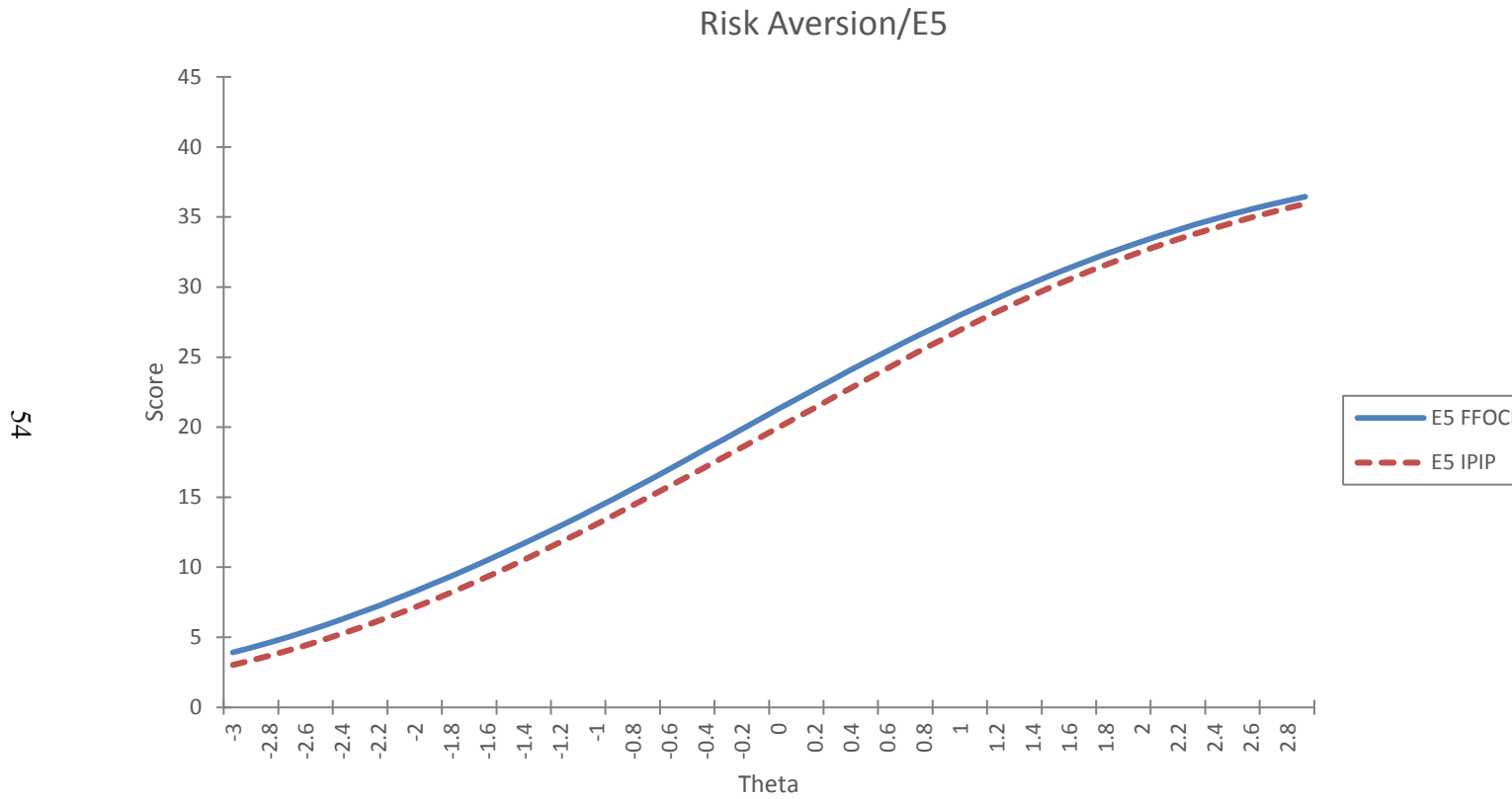
Figure 17
Item Response Curves for FFOCI and IPIP E5: Differences in Alpha



Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

Figure 18

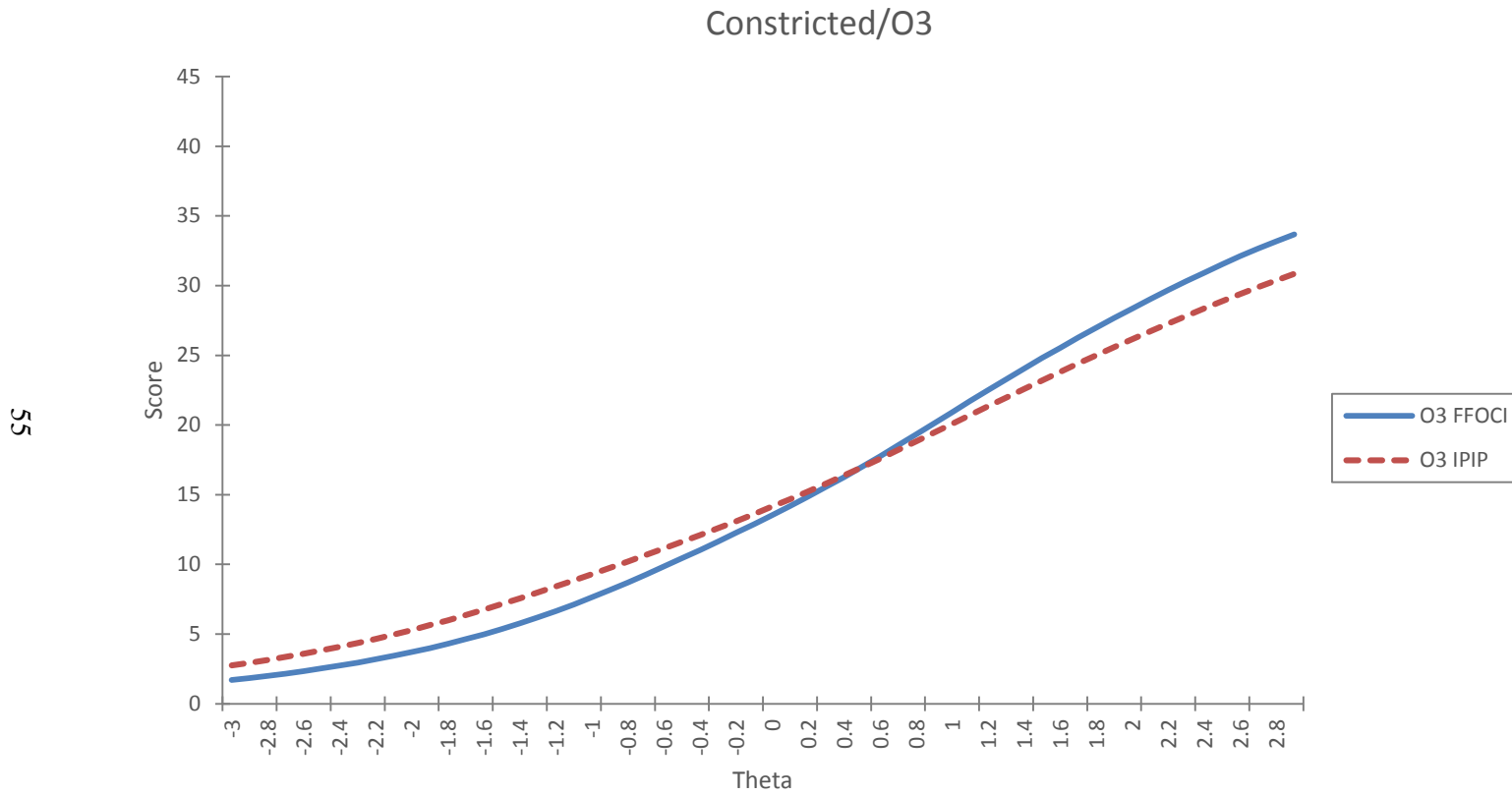
Item Response Curves for FFOCI and IPIP E5: Differences in Beta



Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

Figure 19

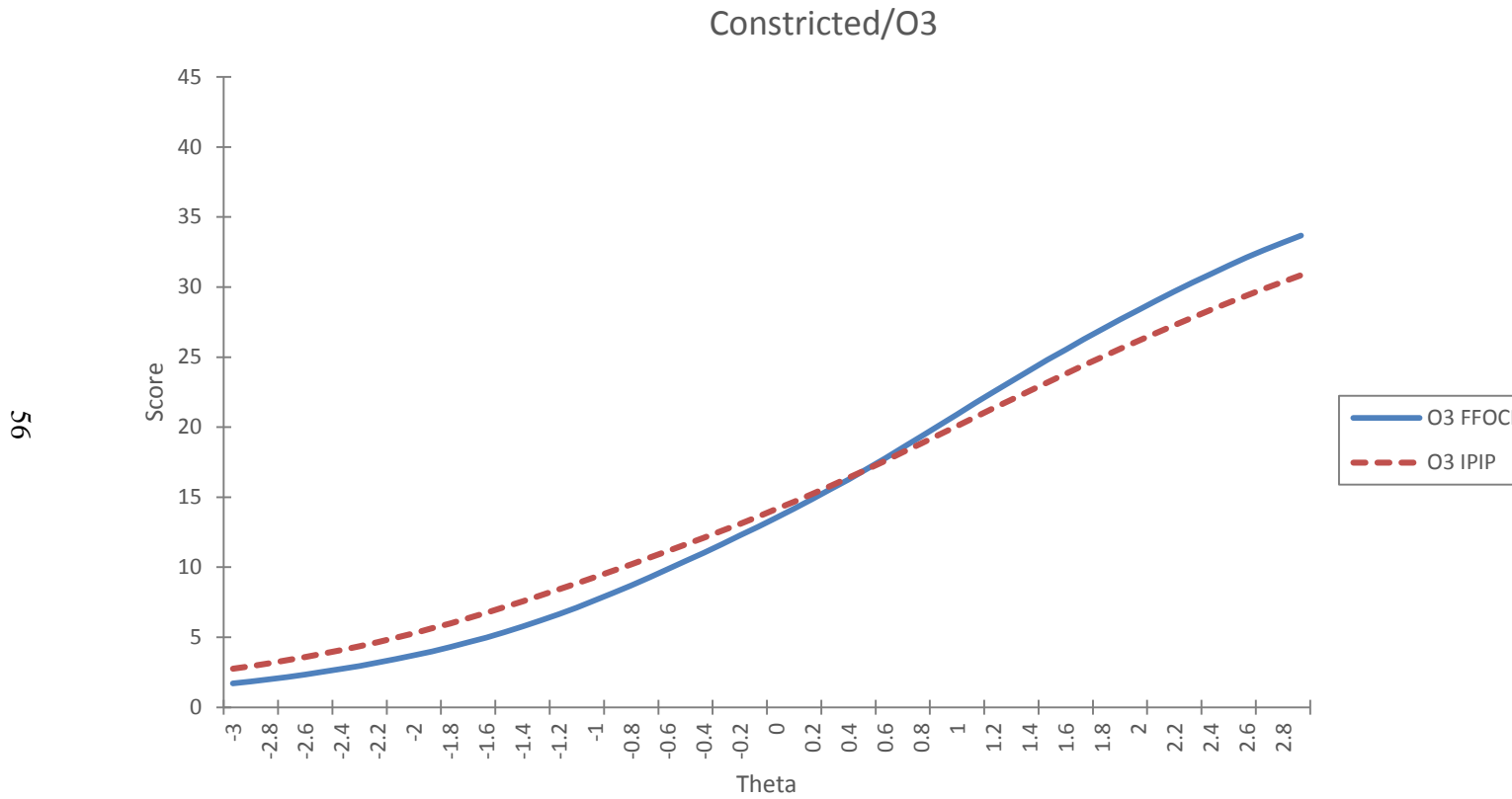
Item Response Curves for FFOCI and IPIP O3: Differences in Alpha



Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

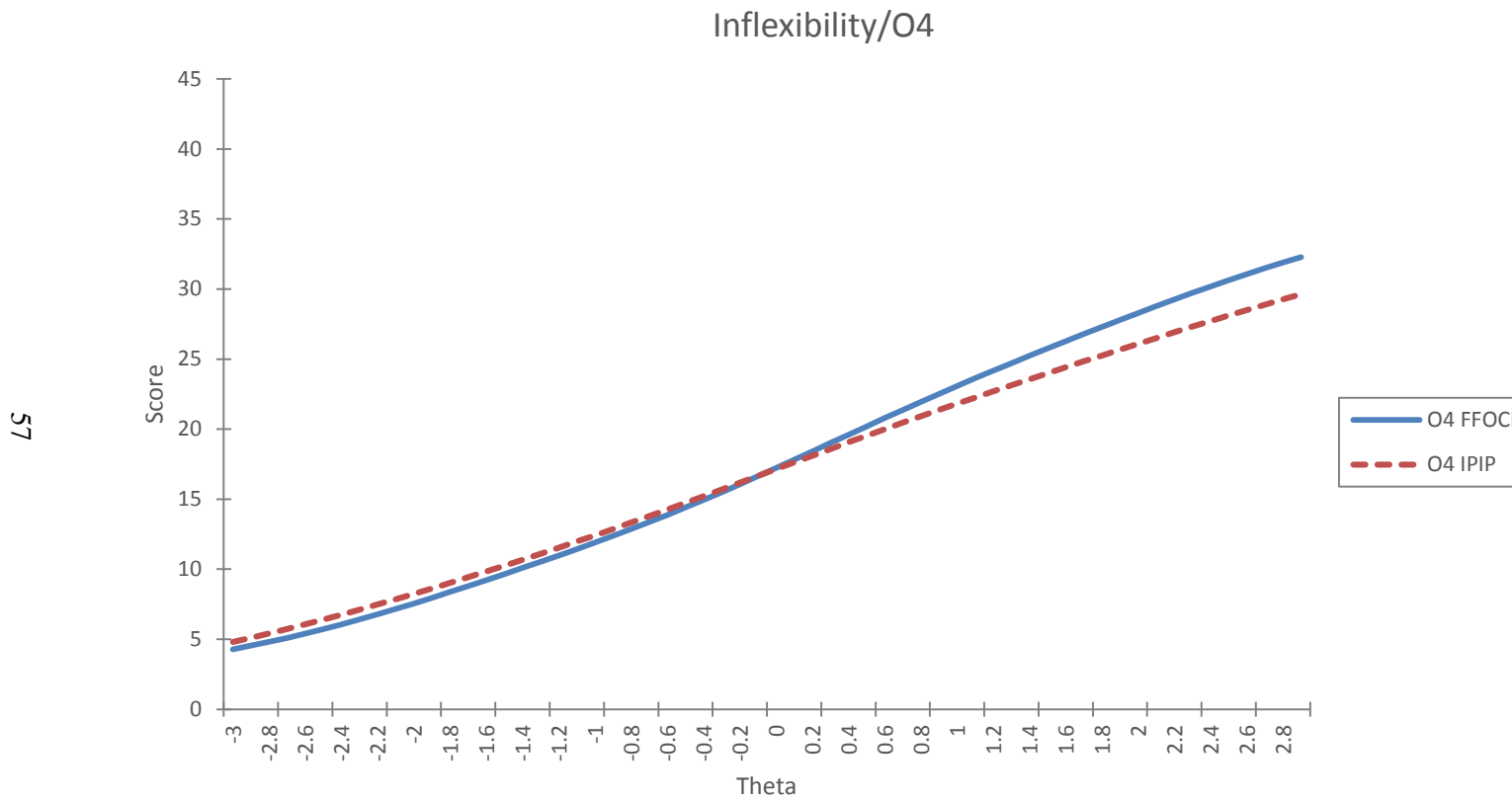
Figure 20

Item Response Curves for FFOCI and IPIP O3: Differences in Beta



Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

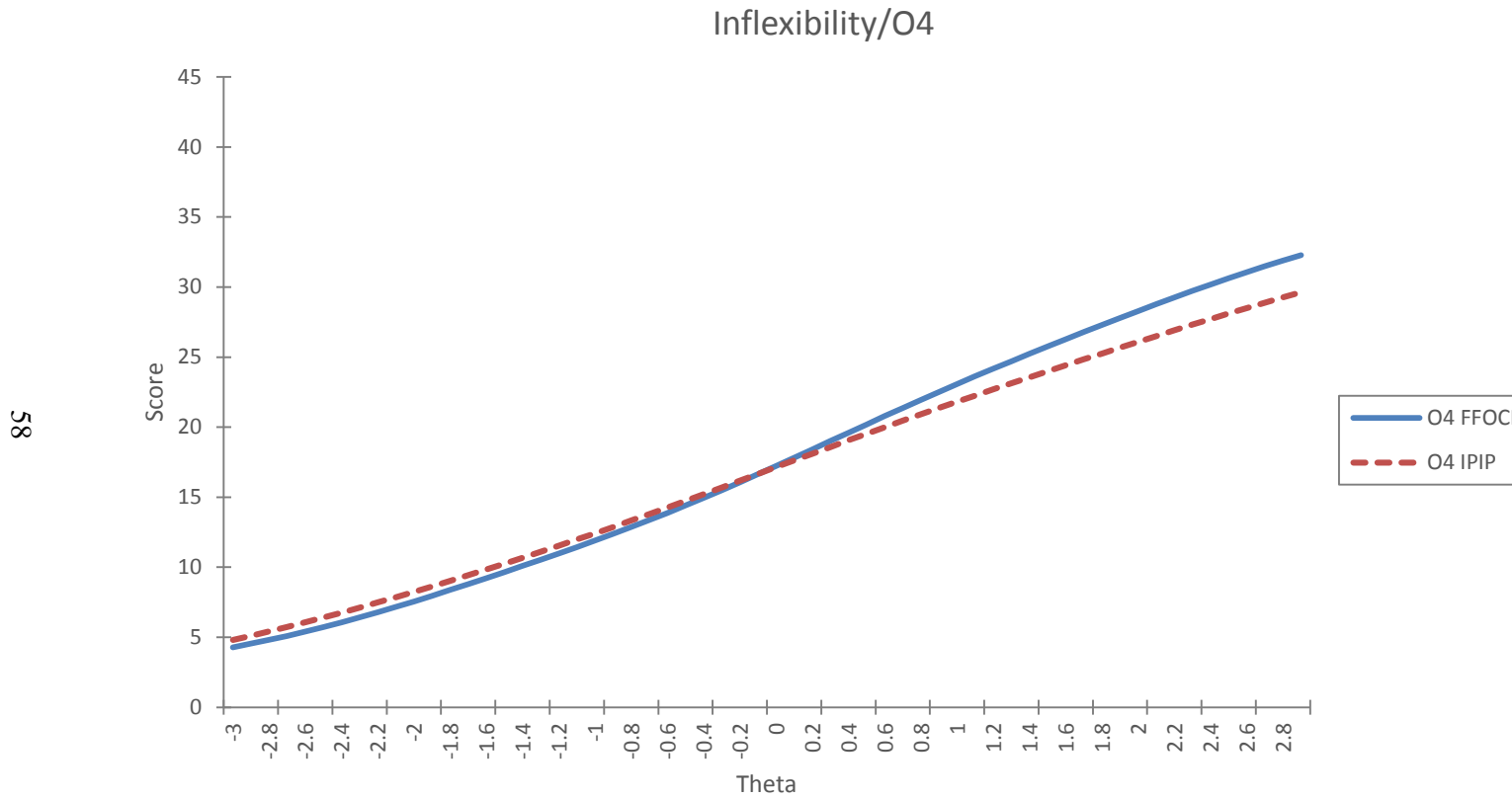
Figure 21
Item Response Curves for FFOCI and IPIP O4: Differences in Alpha



Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

Figure 22

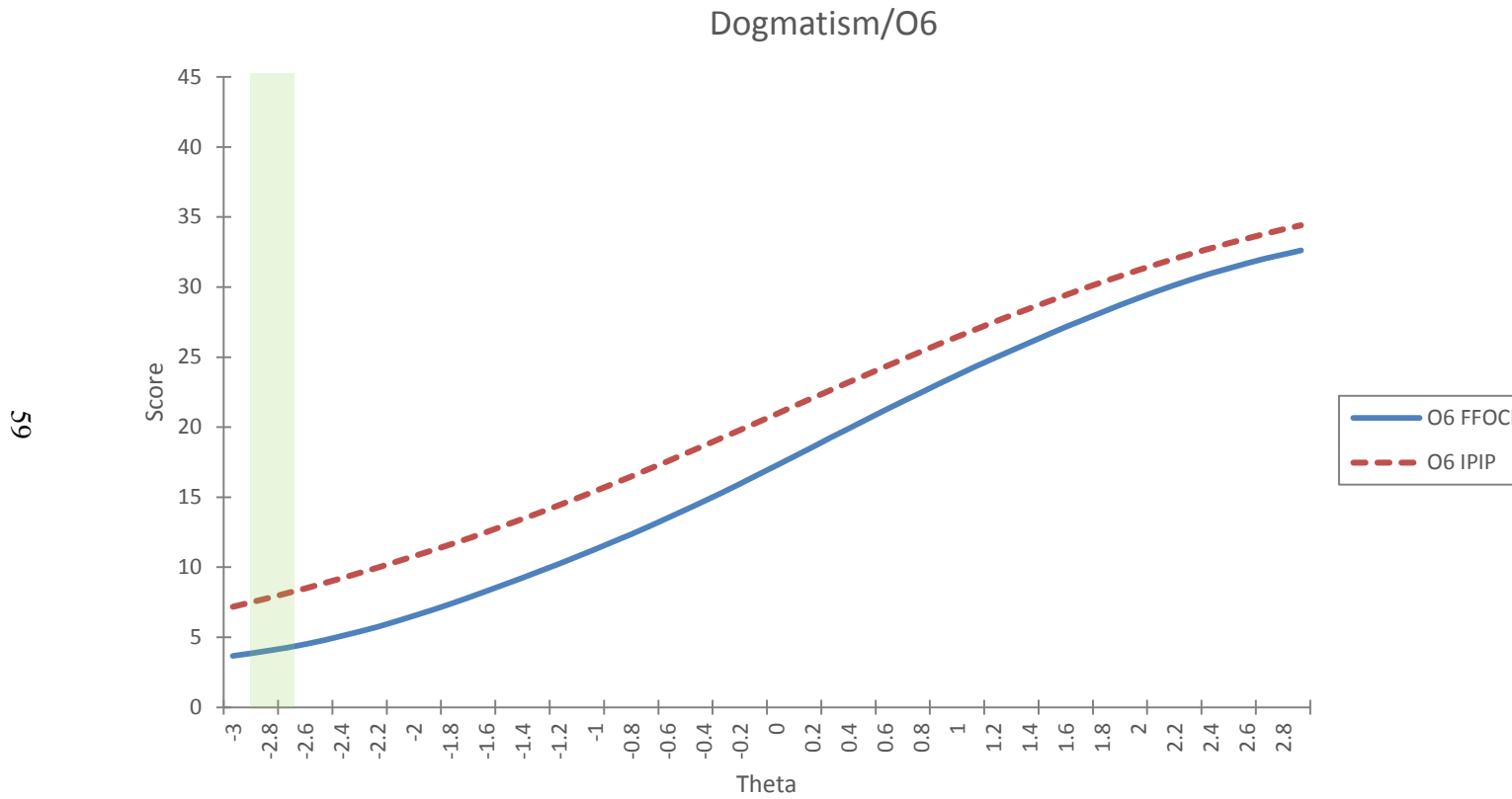
Item Response Curves for FFOCI and IPIP O4: Differences in Beta



Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

Figure 23

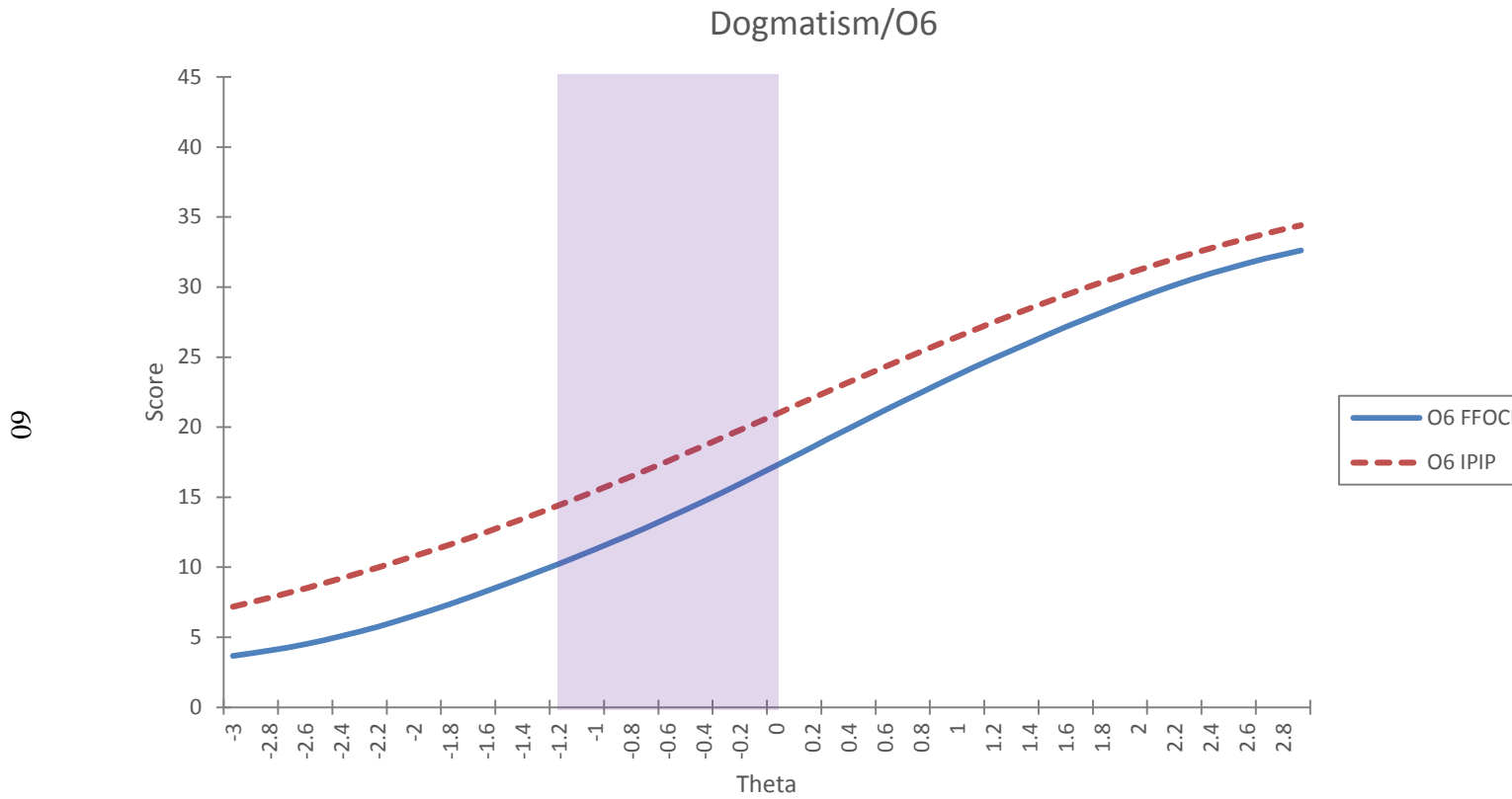
Item Response Curves for FFOCI and IPIP O6: Differences in Alpha



Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

Figure 24

Item Response Curves for FFOCI and IPIP O6: Differences in Beta



Note: FFOCI = Five Factor Obsessive-Compulsive Inventory (Samuel, et al., 2012). IPIP = International Personality Item Pool (Goldberg, 1999).

Chapter 5 Discussion and Conclusions

The 12 FFOCI scales are hypothesized to be assessing maladaptive and/or extreme variants of facets of the FFM as provided within the NEO PI-R (Costa & McCrae, 1992). Consistent with this hypothesis, each of the FFOCI scales correlated significantly with its companion NEO PI-R scale and each pair of scales formed a common unidimensional latent trait. It was further predicted that the six FFOCI scales within the domain of conscientiousness would have greater fidelity for the coverage of the more extreme variants of this trait, whereas the respective IPIP-NEO facet scale would have greater coverage of the lower range. This was not predicted to occur for the FFOCI scales within the domains of neuroticism, introversion, or low openness because the IPIP-NEO is already assessing for maladaptive variants of these traits (Haigler & Widiger, 2001). In these instances, the FFOCI scales could be assessing simply alternative variants of these maladaptive scales that are relatively more specific to OCPD. In contrast, when the IPIP-NEO scales are assessing normal, adaptive variants of a respective facet, the FFOCI maladaptive scales are more readily understood to be assessing extreme variants of the common latent construct.

The current study though obtained mixed results for these hypotheses. As predicted, the FFOCI Punctiliousness and Workaholism scales demonstrated larger values of α at the higher end of the latent trait (when coupled with IPIP-NEO Dutifulness and Achievement-Striving, respectively), and IPIP-NEO Deliberation demonstrated larger values of α at the low end of the latent trait (when coupled with FFOCI Ruminative Deliberation). Also as predicted, the IPIP-NEO scales of Competence, Order, Achievement-Striving, and Deliberation demonstrated higher values of β at the low end

of the latent shared with FFOCI Perfectionism, Fastidiousness, Workaholism, and Ruminative Deliberation, respectively. Moreover, as predicted, no differences were observed in either α or β values for FFOCI Risk Aversion, Constricted, or Inflexibility. The significantly higher value of β at the high end of the latent trait of FFOCI Fastidiousness as compared to IPIP Order is most representative of the differences predicted by the current study (see Figure 4). As a whole, visual inspection of each of the IRT curve pairs demonstrates that both the IPIP-NEO and the FFOCI are providing comparable coverage of the latent traits for their respective scales.

Failing to support hypotheses, however, no differences in α or β were noted for FFOCI Doggedness when coupled with IPIP-NEO Self-Discipline. Contrary to predictions, FFOCI Ruminative Deliberation demonstrated larger levels of β at the low end of the latent trait with IPIP-NEO Deliberation, and IPIP-NEO Dutifulness and Deliberation demonstrated larger levels of β for the high end of the latent trait with Punctiliousness and Ruminative Deliberation, respectively. Overall, 24 predictions of significant differences were made, seven of which were supported, 14 which were unsupported, and three cases in which significant differences in the opposite direction were observed. Twenty-four predictions of no significant difference were also made; nineteen of these were supported. No predictions were made regarding significant differences in the mid-range of the traits, but significant differences were observed in seven cases.

The current study does not stand in isolation when considering the difficulty in applying Item Response Theory to personality data. As previously discussed, Walton et al. (2008) were surprised at the level of overlap in coverage between measures of normal

(Multidimensional Personality Questionnaire) and maladaptive (Personality Psychopathy Inventory) personality. Walton et al. explored the relationship of a measure of general personality with psychopathy rather than a DSM-IV-TR personality disorder, but they also found little support for the assessment of psychopathy covering unique variance at the high end of a common latent trait with general personality functioning

Lynam et al. (2011) also reported mixed success with their IRT analyses of the FFAvA scales (Lynam et al., 2012). They did find that the FFAvA scales Evaluation Apprehension, Despair, Mortifications, Social Dread, and Risk-Averse provided more information at the higher levels of the latent trait than did the respective NEO PI-R scales but they found little to no difference for FFAvA Overcome, Shrinking, Joylessness, and Timorous. It was suggested in the current study that this was perhaps due to the fact that the NEO PI-R neuroticism and introversion scales cover much of the same maladaptive range of avoidant personality traits that is covered by the FFAvA scales. It was for this reason that more success was expected for the FFOCI conscientiousness scales, as there very little coverage of maladaptive conscientiousness within the IPIP-NEO.

Limitations of IRT

It may be the case that personality assessments are not as well-suited to IRT analyses as previously hoped. As discussed previously, IRT was developed in the 1950s and primarily used for educational and proficiency testing. Apart from select applications (Bejar, 1977; Carter & Wilkinson, 1984; de Jong-Gierveld & Kamphuis, 1985; Sapinkopf, 1977), IRT was not being applied to personality measures until 1990, when Reise and Waller applied the two-parameter (2PL) model to the Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982). Since that time, researchers have

increasingly implemented IRT in analyses of personality and psychopathology data (cf. Woods, 2006). Although the 2PL model is considered suitable for dichotomous responses, many personality and psychopathology instruments (including FFM measures) use Likert-type scales. When analyzing ordered polytomous response data, the overwhelming trend has been to employ Samejima's graded response model (GRM; Samejima, 1969). Examples include IRT analyses of the Hare Psychopathy Checklist-Revised (PCL-R; Hare, 1991; Cooke & Michie, 1997), the Structured Interview for DSM-IV Personality (SIDP-IV; Pfohl, Blum, & Zimmerman, 1997; Jane, Oltmanns, South, & Turkheimer, 2007), self-report attachment scales (Fraley, Brennan, & Waller, 2000), and the five-factor model (Walton, et al., 2008; Stepp et al., 2012). The current study followed in this practice, as using Samejima's GRM appears to be the standard for IRT analysis of polytomous data.

Despite the above supporting evidence, a review of the IRT literature uncovers some dissent regarding the confidence with which we can apply and interpret Samejima's model. In fact, confusion exists surrounding the term "graded response model," as Samejima herself appears to use it differently than is the general understanding (Hambleton, van der Linden, & Wells, 2010; Ostini & Nering, 2010; Samejima, 2010). Aside from terminology, the application of the GRM to personality and psychopathology measures is complicated by a number of issues, such as concerns with questions of multidimensionality, model fit, and the existence of latent response classes.

Unidimensionality is one of the primary assumptions of IRT, but no universally accepted guidelines exist for determining dimensionality. In a comparison of decision-making rules regarding both strict and essential unidimensionality, Slocum-Gori and

Zumbo (2011) found that no individual rule or index could be considered best for all sets of conditions. Additionally, despite best efforts to define conceptually distinct dimensions, some personality constructs may be inherently multidimensional (Fraley, Waller, & Brennan, 2000), indicating the need for multidimensional versions of polytomous IRT models (Reckase, 1997). For example, it is well established that psychopathy and each of the DSM-IV-TR personality disorders are quite heterogeneous (Clark, 2007). Factor analyses of the personality disorders have consistently yielded multiple-factor solutions. Rarely is it suggested that a respective personality disorder consistent of one, single factor. Yet, IRT has been applied to measures of DSM-IV-TR personality disorders and psychopathy (Cooke & Michie, 1997; Jane et al., 2007; Walton et al., 2008).

Another underlying assumption when interpreting results of IRT analyses is adequate model fit, which necessitates the use of goodness-of-fit analyses (Fraley, Waller, & Brennan, 2000). Unfortunately, as noted by Ostini and Nering (2010), “lack of adequate fit tests might be considered the Achilles’ heel of polytomous IRT” (p. 10). Using multiple datasets, Cook, Kallen, & Amtmann (2009) empirically compared the performance of five goodness-of-fit statistics: comparative fit index (CFI), non-normed fit index/Tucker-Lewis Index (NNFI/TLI), root-mean-square error of approximation (RMSEA), standardized root-mean-square residual (SRMR), and weighted root-mean-square residual (WRMR). They determined that model fit for the same dataset ranged from “very good fit” to “very poor fit,” depending on the choice of fit statistics reported.

Although classical test theory may demonstrate a normal distribution of population scores, distribution of theta is unobservable. It may be presumptuous to

assume normal distribution of theta, particularly in personality and psychopathology (Woods, 2006). This, in addition to possible multidimensionality, may be affecting IRT results (Cherneyshenko, Stark, Chan, Drasgow, & Williams, 2001), particularly parameter estimates (Riese, Horan, & Blanchard, 2011). Nonparametric approaches may provide more accurate representations of the data, but have largely been avoided, perhaps due to the limitations of applications as compared to parametric IRT models (Hambleton et al., 2010). Parametric models have demonstrated poor fit to FFM data specifically (Cherneyshenko et al., 2001; but see Maydeu-Olivares, 2005), as compared to nonparametric models. This may be due to multidimensionality (Maydeu-Olivares, 2005), but could also be a result of non-monotonic response functions (Cherneyshenko 2001).

Non-monotonic response functions may occur due to differences in scale perception. Latent classes, including those represented by response process, can also decrease model-data fit (Stark, Chernyshenko, Drasgow, & Williams, 2006). Although items may use the same Likert scale, respondents may perceive the scale differently than expected. For each individual, the actual intervals between adjacent categories (such as “strongly agree” and “agree” vs. “disagree” and “strongly disagree”) are generally unknown in advance (Muraki, 1990). The distinction between passing a threshold and responding to a category may lead to misinterpretation regarding the operation of polytomous models (Ostini & Nering, 2010). Understanding latent classes may not be intuitive; characteristics which appear to be associated with differential item functioning (DIF) are not necessarily identical to latent classes (Cohen & Bolt, 2005).

Maij de Meij, Kelderman, and van der Flier (2008) attempted to address the problem of latent classes through the implementation of Mixture Item Response Theory Models. They did observe a difference in prediction of external criteria for neuroticism (but not for extraversion). In a similar effort, Chernyshenko et al. (2001) hypothesized an “ideal point response process.” Ideal point scale construction was further promoted (Stark et al., 2006) and developed (Chernyshenko et al., 2007), and was recommended especially for measurement of high or low scoring individuals. In the context of dimensional personality models, high or low scoring would be associated with personality disordered individuals. Reise et al. (2011) went so far as to say that trying to apply a latent variable measurement model to traditionally-developed scale may be like “old wine in new skins” (p.13). Extant assessments, like “old wine,” have richness and value that is not readily discarded; investment in newer, less mature forms of assessment likely requires significant patience before a similar yield can be expected. These approaches may be the future; the current study builds towards this future with the available tools of the present.

Study limitations and future research

As discussed above, using the existing IRT models to examine polytomous personality data has inherent limitations. Additionally, the current study would have benefitted from a clinical sample. Although the student sample was oversampled for individuals who scored highly on OCPD measures, a clinical sample might be more likely to include those whose extreme personality traits have been demonstrated to be associated with impairment. Problems in living have been considered an important part of conceptualizing personality disorder (Mullins-Sweatt & Widiger, 2010), and could

possibly contribute to differences in assessment at high levels of the latent trait (particularly if it was found to be non-monotonic).

Although IRT is increasing in visibility and application, the current study stands alongside a limited number of similar published findings. IRT requires a large number of participants and the use of specialized software; this may discourage researchers from embarking on comparably ambitious projects. Taking into account the challenges of publishing studies with mixed results, it is also possible that the “file-drawer problem” obscures the true state of the art. Future research may benefit from using IRT and ideal-point response process to develop and refine assessments of personality disorder from a FFM perspective. This approach could combine the “bottom up” strategies of factor analysis with the “top down” parameters of non-classical test theory, as suggested by Chernyshenko et al. (2007) and Reise et al. (2011).

Conclusion

The assessment and diagnosis of obsessive-compulsive personality disorder present ongoing challenges to psychologists and other mental health practitioners. Our understanding of this collection of personality traits will continue to evolve, as will the tools intended to carve the nature of OCPD at its joints. The current study provides strong evidence that the traits underlying OCPD symptoms fall along the continuum of general personality traits as conceptualized by the five-factor model. Additionally, a portion of these findings suggests that when a traditionally “adaptive” trait (such as conscientiousness) exists at the extreme levels found in personality disorders, it may not be well-captured by assessments originally developed for “normal” personality. The

Five-Factor Obsessive-Compulsive Inventory (FFOCI) provides a bridge between the limitations of established general personality measures and the demand for improved assessment of personality disorder.

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CURRICULUM VITAE

Education

- **University of Kentucky, Lexington, KY**
Master of Arts in Clinical Psychology, awarded February 2008
- **Winthrop University, Rock Hill, SC**
Bachelor of Arts, Cum Laude, May 2000
Major: Psychology
Major: Modern Languages (French)

Clinical Experience

- **Clinical Internship**
 - **VA Connecticut Healthcare System, West Haven, CT**
Dates: July 2014 – present; expected completion July 2015
- **Practicum Experience**
 - **Lexington VA Medical Center, Lexington, KY**
Dates: October 2009 – May 2010
 - **Atwood Satellite Prison Camp, Lexington, KY**
Dates: September 2009 – May 2010
 - **Hope Center Recovery Program for Women, Lexington, KY**
Dates: September 2008 – December 2008; June 2009 – August 2009
 - **Jesse G. Harris Psychological Services Center, Lexington, KY**
Dates: July 2007 – July 2009
 - **Jesse G. Harris Psychological Services Center, Lexington, KY**
Dates: August 2006 – August 2011
 - **C. C. Allen Psychological Services Center, Lexington, KY**
Dates: August 2006 – May 2008

- ***Clinically-Oriented Employment***
 - **Clara Maass Hospital, Belleville, NJ**
Dates: April 2012 – June 2014.
 - **Mental Health Recovery Services of Warren & Clinton Counties, Lebanon, OH**
Dates: August 2003 – July 2005
 - **Park Ridge Hospital – HOPE Behavioral Health Services, Fletcher, NC**
Dates: July 2000 – July 2002

Teaching Experience

- **Instructor, Introduction to Personality, University of Kentucky**
Summer 2008
- **Teaching Assistant, Research in Personality, University of Kentucky**
Spring 2007, Fall 2007, Spring 2008, Fall 2009, Fall 2010, Spring 2011
- **Teaching Assistant, Cognitive Psychology, University of Kentucky**
Summer 2010
- **Teaching Assistant, Experimental Psychology, University of Kentucky**
Spring 2010
- **Teaching Assistant, Introduction to Statistics, University of Kentucky**
Fall 2006, Summer 2007
- **Teaching Assistant, Introduction to Psychology, University of Kentucky**
Summer 2011

Honors and Awards

- Recipient of the Presidential Fellowship, 2008-2009
 - Merit-based fellowship
- Outstanding Clinical Service Award, 2008
- Recipient of the Daniel R. Reedy Quality Achievement Fellowship, 2005-2008
 - Merit-based fellowship
- Recipient of the Kentucky Opportunity Fellowship, 2005-2006
 - Merit-based fellowship
- Recipient of Winthrop Scholar Award, 1996-2000
 - Merit-based full-tuition scholarship

Professional Publications

- Widiger, T.A., & **Presnall, J.R.** (2013). Clinical application of the Five-Factor Model. *Journal of Personality, 81*(6), 515–527.

- **Presnall, J.R.** (2012). Disorders of personality: Clinical treatment from a five factor model perspective. In T.A. Widiger & P.T. Costa, Jr. (Eds.), *Personality disorders and the five-factor model of personality* (3rd ed.). Washington, DC: American Psychological Association.
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