



2013

# Personality and Personality Disorder in Adults with Intellectual Disabilities

Sara E. Boyd

University of Kentucky, sarabethboyd@gmail.com

[Click here to let us know how access to this document benefits you.](#)

## Recommended Citation

Boyd, Sara E., "Personality and Personality Disorder in Adults with Intellectual Disabilities" (2013). *Theses and Dissertations--Psychology*. 30.

[https://uknowledge.uky.edu/psychology\\_etds/30](https://uknowledge.uky.edu/psychology_etds/30)

This Doctoral Dissertation is brought to you for free and open access by the Psychology at UKnowledge. It has been accepted for inclusion in Theses and Dissertations--Psychology by an authorized administrator of UKnowledge. For more information, please contact [UKnowledge@sv.uky.edu](mailto:UKnowledge@sv.uky.edu).

## **STUDENT AGREEMENT:**

I represent that my thesis or dissertation and abstract are my original work. Proper attribution has been given to all outside sources. I understand that I am solely responsible for obtaining any needed copyright permissions. I have obtained and attached hereto needed written permission statements(s) from the owner(s) of each third-party copyrighted matter to be included in my work, allowing electronic distribution (if such use is not permitted by the fair use doctrine).

I hereby grant to The University of Kentucky and its agents the non-exclusive license to archive and make accessible my work in whole or in part in all forms of media, now or hereafter known. I agree that the document mentioned above may be made available immediately for worldwide access unless a preapproved embargo applies.

I retain all other ownership rights to the copyright of my work. I also retain the right to use in future works (such as articles or books) all or part of my work. I understand that I am free to register the copyright to my work.

## **REVIEW, APPROVAL AND ACCEPTANCE**

The document mentioned above has been reviewed and accepted by the student's advisor, on behalf of the advisory committee, and by the Director of Graduate Studies (DGS), on behalf of the program; we verify that this is the final, approved version of the student's dissertation including all changes required by the advisory committee. The undersigned agree to abide by the statements above.

Sara E. Boyd, Student

Dr. Thomas Widiger, Major Professor

Dr. David T.R. Berry, Director of Graduate Studies

PERSONALITY AND PERSONALITY DISORDER IN ADULTS WITH INTELLECTUAL  
DISABILITIES

---

DISSERTATION

---

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

By

Sara E. Boyd

Lexington, Kentucky

Director: Dr. Thomas Widiger, Ph.D., Professor of Psychology

Lexington, Kentucky

2013

Copyright © Sara E. Boyd 2013

## ABSTRACT OF DISSERTATION

### PERSONALITY AND PERSONALITY DISORDER IN ADULTS WITH INTELLECTUAL DISABILITIES

Very little research has examined the role of personality in important life outcomes and support needs of adults with intellectual disabilities. This exploratory study includes a sample of 102 community-dwelling adults with intellectual and developmental disabilities, and begins to evaluate the relative contributions of general personality and personality disorder as it they concern their adaptive functioning, Axis I psychopathology symptoms, and residential and vocational supports.

Observer ratings of personality disorder and Five Factor Model and Reiss Profile general personality functioning were obtained from direct service providers who knew the participants well, and archival file data (e.g., IQ, adaptive functioning scores, medications prescribed, and diagnoses) were collected after informed consent and assent were obtained from the participants. The results suggest that both personality and personality disorder, relate the intensity of supports required, the number of psychiatric medications prescribed, maladaptive behavior, and the amount of Axis I psychopathology exhibited by the participants. Results of the study are discussed with reference to implications for service delivery and planning and future research.

**KEYWORDS:** Intellectual Disabilities, Developmental Disabilities, Personality Disorder, Five Factor Model, Adaptive Functioning

Sara E. Boyd

July 2013

PERSONALITY AND PERSONALITY DISORDER IN ADULTS WITH INTELLECTUAL  
DISABILITIES

By

Sara E. Boyd

Thomas Widiger, Ph.D.  
Director of Dissertation

David T. Berry, Ph.D.  
Director of Graduate Studies

July 2013

## ACKNOWLEDGMENTS

My deep gratitude, first and foremost, goes to my dissertation chair, Dr. Thomas Widiger, Ph.D. His assistance, guidance, and feedback have been instrumental throughout not only this dissertation process, but my entire time in graduate school at the University of Kentucky. Harold Kleinert, Ed.D., has provided me with more help, support, and encouragement, not to mention so many opportunities for professional and personal growth, than I can fully and thoroughly acknowledge here.

My committee members and outside reader have also contributed, not only to this dissertation but also to my thinking about this topic and the field of psychology generally. Thank you to Rich Milich, Ph.D., Suzanne Segerstrom, Ph.D., and Thomas Prout, Ph.D.

Tory Eisenlour-Moul and Karen Derefinko, Ph.D., were invaluable resources and sounding boards as I was thinking through my results, not to mention encouraging cheerleaders as I made my way through this daunting task.

The participants in the research project have my regard and my gratitude for their patience and their willingness to let me into their lives to conduct this research. I sincerely hope that some of this work assists, at least in some small way, in the improvement of the lives of people with developmental and intellectual disabilities. Thank for your giving me the opportunity to meet and work with you. It was a genuine pleasure.

Last but not least, I would like to acknowledge my parents, Melissa Boyd, M.S.W., and Jerry Boyd, Ph.D. I was unbelievably fortunate to be raised in a household with such a bounty of compassion for and curiosity about people and support for education. My brother, Justin Boyd, is my best friend and always will be. I would never have been able to do this without you all.

## TABLE OF CONTENTS

Acknowledgments.....	iii
Table of Contents.....	iv
List of Tables.....	vi
Chapter One: Introduction.....	1
Personality disorder and general personality functioning in adults with ID.....	1
Chapter Two:	
Methods.....	5
Participants.....	5
Collection of observer ratings.....	5
File data collection.....	5
Instruments.....	5
Inventory for Client and Agency Planning (ICAP).....	5
Psychiatric Assessment Schedule for Adults with Developmental Disabilities—Checklist (PAS Checklist).....	6
Standardised Assessment of Personality (SAP).....	6
NEO-PI-R Form R.....	6
Reiss Profile Mental Retardation/Developmental Disability (MR/DD) Version.....	6
Analyses.....	6
Chapter Three: Results.....	7
Hypothesis One.....	7
Hypothesis Two.....	10
Hypothesis Three.....	11
Hypothesis Four.....	16
Hypothesis Five.....	24
Hypothesis Six.....	24
Chapter Four: Discussion.....	33
Instruments for assessing general personality in people with ID.....	33

Axis I psychopathology and personality functioning.....	34
General personality and personality disorder.....	34
FFM personality and life outcomes.....	35
Use of personality assessment in developing support plans for adults with ID.....	36
Limitations.....	36
References.....	38
Vita.....	42

## LIST OF TABLES

Table 1, Bivariate correlations between NEO PI-R facets and Reiss Profile MR/DD motives.....	7
Table 2, Bivariate correlations between NEO PI-R domains/facets and dependent variables.....	11
Table 3, Bivariate correlations between Reiss Profile MR/DD motives and dependent variables.....	14
Table 4, Bivariate correlations between SAP scales and dependent variables.....	15
Table 5, Hierarchical regression of ICAP Total Service Score; Reiss predictors entered in last step.....	17
Table 6, Hierarchical regression of ICAP Total Service Score; NEO PI-R predictors entered in last step.....	18
Table 7, Hierarchical regression of ICAP Social Skills and Communication; Reiss predictors entered in last step.....	19
Table 8, Hierarchical regression of ICAP Social Skills and Communication; NEO PI-R predictors entered in last step.....	20
Table 9, Hierarchical regression of ICAP Maladaptive Behavior on IQ, total SAP score, and NEO PI-R predictors.....	21
Table 10, Hierarchical regression of Psychiatric Assessment Schedule Checklist, Reiss predictors entered in last step.....	22
Table 11, Hierarchical regression of the Psychiatric Assessment Schedule Checklist, NEO PI-R predictors entered in last step.....	23
Table 12, Hierarchical regression of number of psychiatric diagnoses, Reiss predictors entered last.....	25
Table 13, Hierarchical regression of number of psychiatric diagnoses, NEO PI-R predictors entered in last step.....	26
Table 14, Hierarchical regression of number of psychotropic medications, Reiss motives entered in last step.....	27
Table 15, Number of psychotropic medications, NEO PI-R predictors entered in last step.....	28
Table 16, Bivariate correlations between NEO PI-R facets/domains and the Standardized Assessment of Personality.....	29
Table 17, Correlated correlations between Samuel & Widiger (2008) and ID sample.....	32

## Chapter One: Introduction

The importance of personality for understanding human behavior is well established (Matthews et al., 2009; Johns, Robins, & Pervin, 2008). Personality traits are central in predicting a wide array of important life outcomes, such as subjective well-being, social acceptance, relationship conflict, marital status, academic success, criminality, unemployment, physical health, mental health, and job satisfaction (Lahey, 2009; Ozer & Benet-Martinez, 2006; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007); even mortality years into the future (Deary, Weiss, & Batty, 2011). However, to date, personality and personality assessment-related research has been restricted largely to samples of individuals of average or above-average intelligence, with very little research concerning individuals with intellectual disability (ID).<sup>1</sup>

Approximately seven to eight million individuals with ID are living in the United States. These individuals experience mental disorder at a rate of 2-4 times that of the general population, with one-third or more of people with ID exhibiting mental, behavioral, and/or personality disorders significant enough to warrant mental health services (Nezu, Nezu, & Gill-Weiss, 1992). People with co-occurring ID and mental disorder have been characterized as one of the most underserved populations in the United States (Fletcher, Loschen, Stavrakaki, & First, 2007). One factor likely contributing to the underserved status is the phenomenon of *diagnostic overshadowing* whereby clinicians tend to attribute mental disorder symptoms to the ID instead of a separate diagnostic condition (Reiss, Levitan, & Szyszko, 1982).

The concerted efforts of advocates and researchers though have drawn attention to the importance of acknowledging aspects of cognitive and emotional functioning beyond the deficiencies in intellectual functioning. In recent years, the federal government has also drawn greater attention to the mental health disparities experienced by individuals with ID (National Institutes of Health, 2001), as well as the need for an improved integration of assessment findings with treatment interventions and service systems (U.S. Department of Health and Human Services, 2002). Although these developments are encouraging, at the present time there are serious limitations in the ability of clinicians to appropriately assess the functioning of adults with ID. Consequently, because access to treatments, services, and supports are linked to adequate assessment, individuals with ID frequently lack access to interventions that could alleviate suffering and promote better life functioning (Fletcher, et al., 2007).

### Personality Disorder and General Personality Functioning in Adults with ID

What research that has been conducted within the ID population has suggested that personality disorder is notable for its broad and serious impact on the lives of adults with ID (Cowley, et al., 2004) (Lidher, Martin, Jayaprakash, & Roy, 2005). Some authors have argued that, for individuals with ID, the presence of a personality disorder has the potential to be more disabling than the intellectual disability itself (Panek & Wagner, 1993) (Torr, 2003). In a five year follow-up survey of individuals with ID living in the community, Lidher and colleagues (Lidher, et al., 2005) found that individuals diagnosed with a personality disorder were more likely to receive psychotropic drugs, show increased offending behavior, and have more hospital admissions. Several other researchers (Ballinger & Reid, 1988) (Deb & Hunter, 1991) (Lidher, et al., 2005) have observed that personality disorder seems to be a prominent factor in the ability of individuals with ID to successfully transition to and remain in the community.

Personality disorder may also be linked to the development and expression of other mental disorders in individuals with ID. Lidher and colleagues (Lidher, et al., 2005) found that

individuals with a personality disorder diagnosis were likely to have additional psychiatric disorders, and Goldberg (1995) also found increased prevalence of Axis I disorders in individuals with ID and personality disorder. This is consistent with the literature on comorbidity of personality disorder and Axis I disorders in the general population (Clark, 2007). Similarly, the personality traits of individuals with intellectual disability, both normal and pathological, may influence the manifestation and form of Axis I disorders, as well as the use of coping strategies (Dosen, 2005). In other words, general personality functioning, in addition to personality disorder, should perhaps also be of interest to investigators.

Beyond the negative effects of personality disorder, researchers have provided evidence for the role of general personality functioning in several significant life outcomes for adults with typical intelligence, including degree of disability (Grant, et al., 2004), mental health (Trull & Sher, 1994); (Lahey, 2009), physical health and longevity (Ozer & Benet-Martínez, 2006), occupation choice (Larson, Rottinghaus, & Borgen, 2002) (Lahey, 2009) (Ozer & Benet-Martínez, 2006), job performance (Barrick & Mount, 1991), prosocial behavior such as volunteerism (Penner, 2002), and quality and valence of interpersonal relationships (Ozer & Benet-Martínez, 2006). These outcomes are of particular interest to researchers of and advocates for people with ID, as there are documented disparities for these persons in many, if not all, of the aforementioned domains. For example, individuals with ID experience three-to-four times the unemployment rate compared to individuals without disabilities (Yamaki & Fujiura, 2002), and they are more likely to work in segregated/sheltered settings (Olney & Kennedy, 2001).

With respect to community participation, individuals with ID have been found to have less participation in community groups, and their leisure activities have been characterized by researchers as “solitary and passive” (Verdonschot, de Witte, Reichrath, Buntinx, & Curfs, 2009). Although it is true that environmental factors such as poverty, limited access to transportation and education, and social devaluation bear much of the responsibility for these disparities (along with the ID), it is also possible that understanding more about individual differences within the ID population could promote tailoring of employment and community opportunities for individuals with ID.

Although a few instruments for assessing personality in adults within ID exist, almost none are based on broad, general theories of personality developed for use with the general population. Instead, nearly all of the existing personality assessment instruments for adults with ID are based upon theories developed specifically with respect to individuals with ID (e.g., the EZ-Personality Questionnaire; Zigler, Bennet-Gates, Hodapp, and Henrich, 2002), as though personality functions in some qualitatively different manner within this population.

An exception to this pattern is the Reiss Profile of Fundamental Goals and Motives, MR/DD version (Reiss & Havercamp, 2001). Although the MR/DD version varies from the Reiss Profile developed for use with intellectually typical individuals, the underlying theory is essentially the same. The Reiss Profile of Fundamental Goals and Motivational Sensitivities Mental Retardation Version is a relatively widely-used observer rating scale instrument based upon Reiss’ theory of fundamental motives (Reiss & Havercamp, 1997). This theory emphasizes the role of intrinsic, universal motives in human behavior. It is noteworthy that the theoretical conceptualization of motives and their role in behavior is the same for people with and without intellectual disabilities. The 16 fundamental motives assessed by the Reiss Profile (e.g., power, affiliation, order) are modeled in part after the 14 fundamental needs assessed by the Personality Research Form (Jackson, 1976), a dimensional model of personality developed for the general population. This is the more parsimonious approach, using a single theory about human personality/motivation to generate assessment instruments that meet the needs of specific populations.

The Reiss Profile MR/DD has stimulated several validity-related studies, examining and supporting the instrument's inter-rater reliability (Lecavalier & Havercamp, 2004), factor structure (Reiss & Havercamp, 1998), and stability of motivational profile (Lecavalier & Tasse, 2002). The Reiss Profile has not been comprehensively compared to other measures of personality, such as the NEO Personality Inventory-Revised (NEO PI-R; Costa & McCrae, 1992), either in intellectually typical populations or with samples of individuals with intellectual disability, and the Reiss Profile of Fundamental Goals and Motives has had only a limited impact in research and assessment of personality within the general population. Olsen and Weber (2004) did though conduct an investigation at the domain level. This study found that the Reiss motives related to NEO PI-R domains in logical patterns; for example, the Reiss motive of Social Contact showed a strong positive relationship with the NEO PI-R Extraversion, the motive of Curiosity significantly correlated with NEO PI-R Openness, and the motive of Order was significantly correlated with NEO PI-R Conscientiousness.

A comparison of the Reiss Profile to the NEO PI-R is appropriate given the predominance of the NEO PI-R within general personality research. The NEO PI-R assesses the five factor model of personality (FFM). The FFM consists of extraversion, agreeableness, neuroticism, conscientiousness/constraint, and openness to experience (McCrae & Costa, 2003). Costa and McCrae (Costa & McCrae, 1992) have further differentiated the five broad domains in terms of more specific facets through their research and development of the NEO PI-R. The FFM does appear to be the predominant dimensional model of general personality structure, certainly overshadowing the theoretical model of the Personality Research Form and Reiss Profile (Caspi, Roberts, & Shiner, 2005; Deary et al., 2011; John & Naumann, 2010; John, Naumann, & Soto, 2008; Ozer & Benet-Martinez, 2006). The FFM is bolstered by a considerable body of basic scientific research to support the validity of this classification of personality, including well-documented childhood antecedents (Caspi, Roberts, & Shiner, 2005; Widiger, De Clercq, & De Fruyt, 2009; Mervielde, De Clercq, De Fruyt, & Van Leeuwen, 2005), lifespan temporal stability (Roberts & DelVecchio, 2000), multivariate behavioral genetic support for the personality structure (Yamagata, et al., 2006), molecular genetic support for neuroticism (Widiger & Mullins-Sweatt, 2009), and both emic (Ashton, et al., 2004) and etic (Allik, 2005) cross-cultural evidence. Clark (2007) suggests it is "widely accepted as representing the higher-order structure of both normal and abnormal personality traits" (p.246).

The FFM is an appealing candidate for the conceptualization and assessment of personality in individuals with intellectual disability given its successful use in integrating disparate personality trait research in a wide range of fields (Goldberg, 1993; John & Naumann, 2010; John, et al., 2008; Ozer & Reise, 1994). The FFM also has an advantage of an observer rating form (NEO PI-R Form R) that would be useful in the study of persons within an ID population, and there is extant evidence for its validity when used with comparably cognitively impaired populations. Although the FFM has not been specifically validated for use with individuals with ID, researchers have utilized successfully FFM measures with individuals with traumatic brain injury (Kurtz, Putnam, & Stone, 1998) (Lannoo, de Deyne, Colardyn, de Soete, & Jannes, 1997), functionally impaired elderly individuals (Weiss & Costa, 2004), and military recruits who obtained low scores on a measure of general cognitive ability (Allik & McCrae, 2004).

If the use of the FFM personality assessment of individuals with ID can be supported, then the extensive research on FFM personality can be profitably utilized with respect to the mental health, medical, occupational, and social concerns of individuals with ID, just as it has been for intellectually typical individuals. This dissertation describes a study of personality functioning in a sample of adults with intellectual disability in order to evaluate the potential use

of the NEO PI-R with individuals with ID and to examine the relationship of personality characteristics and IQ with mental disorder (Axis I and personality) and adaptive life skills. The specific hypotheses for this study are: 1) The FFM domains and facets will related to the Reiss MR/DD motives in a theoretically rational manner, consistent with previous research findings; 2) general personality functioning and personality disorder will demonstrate a significant increment in predicting adaptive functioning variance, over and above IQ; 3) general personality traits and personality disorder will account for a significant amount of variance in Axis I symptoms, over and above IQ; 4) personality-related predictors will achieve significant incremental validity over and above IQ and personality disorder symptomology when accounting for adaptive functioning and Axis I psychopathology; 5) The NEO PI-R will outperform the Reiss MR/DD version in accounting for variance in the adaptive functioning and Axis I dependent variables, over and above IQ and personality disorder; and 6) the pattern of correlations between the SAP PD scales and the NEO PI-R facets will largely mirror the findings of Samuel and Widiger's (2008) meta-analysis of 16 studies (18 samples) of intellectually typical individuals.

Copyright Sara E. Boyd 2013

## Chapter Two: Methods

### Participants

One-hundred two participants were recruited from two community-based agencies in rural Central Illinois. Approval for this study was obtained from the University of Kentucky Institutional Review Board. Fifty-three participants were female; 49 were male. Nearly all participants were Caucasian (98 Caucasian, 2 African-American, and 2 Latino participants), and ages at time of study recruitment and data collection ranged from 21 to 88, with a mean age of 41.1 years. All but three participants were their own legal guardians. The guardians of the other three participants provided consent on their behalf, but research personnel also sought and obtained assent from these individuals. IQs ranged from 20 to 70, with an average IQ of 54.0 (SD = 10.2). Twenty participants had a diagnosed genetic syndrome, the most common of which was Down syndrome (N = 13). Many participants (55.9%) were living in group home residential settings at the time of data collection; the remaining participants were residing with family (24.5%), or in larger residential facilities (19.6%).

### Collection of observer ratings.

The author contacted staff members at the residential settings of the participants to invite their participation in the study as informants and to establish their eligibility. Staff raters were required to have had weekly contact with the individual being rated for at least 3 months and must be at least 18 years of age; staff participants reported knowing the individuals being rated for an average of 6 years. Individuals who agreed to participate were provided with study materials including the following: the Reiss Profile MR/DD version (Reiss & Havercamp, 1998) the NEO PI-R Form R (Costa & McCrae, 1992), the PAS Checklist (Prosser, et al., 1998), and a revised observer-rating version of the Standardised Assessment of Personality (Mann, Jenkins, Cutting, & Cowen, 1981). Upon completion of the study materials, the staff member was compensated for his or her time with a payment of \$25.

In order to assess for effects associated with individual observers, the SAS statistical software program (PROC MIXED command) was used to calculate an intraclass correlation coefficient for unbalanced data (because there was not a consistent number of ratings provided per observer). Of the personality variables (NEO PI-R calculated only at the domain level), only Openness to Experience was significant for the percent of variance accounted for by rater (39%). Given that few facets of openness emerged as significantly correlated with dependent variables, additional statistical procedures were not undertaken to account for rater effect, and Openness facets were not included in regression analyses.

### File Data Collection.

For all participants, files were reviewed and data collected (see the File Data Collection Form measure description) concerning demographic information, ICAP scores, diagnosis of genetic syndrome, IQ scores, previous adaptive testing results, major medical and psychiatric diagnoses, and medications.

### Instruments.

*Inventory for Client and Agency Planning (ICAP)*. The ICAP (Bruininks, et al., 1986) is a widely-used measure of adaptive and maladaptive behaviors to determine the type and intensity of assistance required by individuals with disabilities. The ICAP assesses motor skills, social and communication skills, personal living skills, and current support services utilized. The ICAP is usually completed by an observer who knows the individual well (e.g., teacher, parent, or case

manager). The ICAP has a computerized scoring system which provides scores in each domain as well as a service score indicating the intensity and type of support required by the individual being rated. ICAP data was obtained via file data collection.

***Psychiatric Assessment Schedule for Adults with Developmental Disability Checklist (PAS Checklist)***. This measure, developed for use with adults with developmental disabilities (Prosser, et al., 1998), was designed to be completed by direct care staff or by informant interview. The PAS-Checklist consists of 25 items rated on a four-point scale. Scales include Depression, Anxiety, Mania/Hypomania, Obsessive-Compulsive Disorder, Psychosis, Autism, and Unspecified Disorder.

***Standardised Assessment of Personality (SAP)***. The SAP (Mann, et al., 1981) is originally a semi-structured interview conducted (face-to-face or via telephone) with an informant. The measure provides DSM-IV-TR personality disorder diagnosis and has good inter-rater ( $\kappa = .76$ ) and temporal ( $\kappa = .54-.75$ ) reliability (McKeon, Roa, & Mann, 1984) (Pilgrim, Mellers, Boothby, & Mann, 1993). The SAP has been previously utilized with samples of adults with ID (Flynn, Matthews, & Hollins, 2002). For this study, the interview was converted to an observer-report measure.

***NEO PI-R Form R***. The NEO PI-R is one of the most commonly used measures of the FFM. The observer-report version (Form R) is comprised of 240 questions, each one rated on a five point scale, and it produces scores for both the five factors, or domains, of general personality functioning: Neuroticism/Emotional Instability, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. Each domain is comprised of six facets, and the instrument can provide scores for all 30 facets (such as Angry Hostility, Altruism, Self-Discipline, Openness to Aesthetics, and Gregariousness). The manual for the NEO-PI-R provides the internal consistency statistics for the measure; the coefficient alphas for Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness are .92, .89, .87, .86, and .90, respectively. Inter-rater reliability of the NEO PI-R observer rating is also good at both the facet (intraclass coefficient range = .71- .98) and domain levels (intraclass coefficient range = .94-.97) (Costa & McCrae, 1992).

***Reiss Profile Mental Retardation/Developmental Disability (MR/DD) Version***. The Reiss Profile MR/DD is a rating instrument developed for use with adults with intellectual and/or developmental disabilities, based upon the Reiss Profile of Fundamental Goals and Sensitivities (for adults of typical intellectual functioning), completed by an informant, and comprised of 100 items distributed across 15 scales (e.g., Food, Help Others, Frustration, Acceptance). Ratings are based upon a 5 point Likert scale. Interrater reliability evidence is acceptable (intraclass correlation coefficient average = .52), and internal consistency is good (average alpha = .84) (Lecavalier & Haverkamp, 2004). The Reiss Profile MR/DD has been utilized in Person-Centered Planning interventions and crisis planning (Reiss, manuscript in preparation) as well as roommate-matching (Wiltz & Reiss, 2003).

## **Analyses**

Analyses are described for each hypothesis in the results section. With the exception of the intraclass correlation coefficient noted in the foregoing, Stata IC 10.0 was used for all analyses.

Copyright Sara E. Boyd 2013

## Chapter Three: Results

### Hypothesis 1

To examine the relations between NEO PI-R domains/facets and Reiss Profile motives, pairwise correlation analyses were performed (full results presented in Table 1). The results were overall consistent with expectations; the patterns of correlation were a) rational, and b) generally consistent with previous results from both ID (Boyd, 2012) and non-ID (Olsen & Weber, 2004) samples. Reiss scales with obvious and intuitive relations to NEO PI-R facets and domains emerged as significantly correlated. For example, Reiss Social Contact, described by Reiss as “Desire for friends/interaction with other people” (Reiss and Havercamp, 1998) was positively correlated with the NEO PI-R domain of Extraversion ( $r = .70, p < .001$ ) and Agreeableness ( $r = .43, p = .002$ ); the most rationally linked NEO PI-R facets, gregariousness and warmth obtained strong correlations ( $r = .61, p < .001$ ; and  $r = .77, p < .001$ , respectively).

Table 1. Bivariate correlations between NEO PI-R facets and Reiss Profile MR/DD motives.

	Veng- eance	Help Others	Food	Rejection	Pain	Sex	Order	Frustration	Independ- ence	Curiosity	Attention	Anxiety	Social Contact	Morality
N1	.07	.08	-.07	<b>.40</b>	<b>.37</b>	-.13	-.01	.04	-.02	-.22*	-.06	<b>.40</b>	-.13	-.02
N2	<b>.76</b>	-.34*	.22*	.01	.33*	.17	<b>.37</b>	<b>.76</b>	.16	-.17	<b>.41</b>	.25*	-.34*	-.30*
N3	<b>.44</b>	-.27*	.01	.32*	.34*	-.01	.19	<b>.44</b>	-.10	-.27*	-.08	<b>.44</b>	-.33*	-.30*
N4	-.15	.03	-.20	<b>.40</b>	.11	-.10	-.05	-.08	-.11	-.03	<b>-.41</b>	.25*	-.05	-.08
N5	<b>.38</b>	-.31*	<b>.60</b>	-.09	.21*	.14	.01	.25*	-.02	-.03	<b>.52</b>	-.01	.12	-.27*
N6	<b>.41</b>	-.16	-.12	.22*	.25*	.03	.09	.34*	-.28*	<b>-.58</b>	.05	<b>.40</b>	<b>-.37</b>	-.14
E1	<b>-.51</b>	<b>.53</b>	-.05	.09	-.21*	.18	-.22*	-.36*	.16	<b>.52</b>	.30*	<b>-.45</b>	<b>.77</b>	.25*
E2	-.36*	<b>.58</b>	-.05	.06	.00	.17	<b>-.39</b>	-.33*	-.08	.26*	.13	-.29*	<b>.61</b>	<b>.38</b>
E3	.31*	-.07	.09	-.12	.29*	.07	.26*	.35*	<b>.40</b>	.18	<b>.60</b>	-.20*	.12	-.19
E4	-.19	-.16	.01	<b>-.44</b>	-.20*	-.09	.13	.03	.02	-.14	.10	-.02	-.17	-.05
E5	.04	.19	.19	-.16	.18	.27	-.09	.09	<b>.40</b>	<b>.45</b>	<b>.53</b>	<b>-.42</b>	<b>.51</b>	.00
E6	<b>-.53</b>	<b>.48</b>	.17	-.12	-.17	.17	-.21	<b>-.42</b>	.22	<b>.44</b>	.16	<b>-.46</b>	<b>.54</b>	.30
O1	.16	.18	.24*	.06	.00	.34*	-.06	-.10	.08	.06	.28*	-.11	.15	.12
O2	-.18	.15	.08	-.08	-.10	.10	-.05	-.25*	.22*	<b>.38</b>	.12	-.30*	.26*	.15
O3	.12	.10	-.01	.26*	.23*	.24*	.06	.20*	.24*	.32*	.30*	.03	.36*	-.20*
O4	-.21*	-.03	.22*	-.26*	-.28*	-.14	<b>-.50</b>	<b>-.40</b>	-.12	.21*	.14	-.24*	.24*	-.02

Table 1 (continued).

	Veng- eance	Help Others	Food	Rejection Pain	Sex	Order	Frustration	Independ- ence	Curiosity	Attention	Anxiety	Social Contact	Morality	
O5	.04	.15	.11	-.22*	-.07	.12	.14	-.13	<b>.41</b>	.34*	.03	-.13	-.11	.09
O6	-.28*	.16	-.23*	-.04	-.30*	-.14	<b>-.40</b>	-.20	-.24	.00	-.19	-.03	.16	.11
A1	<b>-.67</b>	<b>.43</b>	-.08	.04	-.34*	.01	-.25*	<b>-.46</b>	.05	<b>.38</b>	.01	<b>-.39</b>	<b>.58</b>	.27*
A2	<b>-.54</b>	.15	-.34*	-.02	<b>-.55</b>	-.31*	-.25*	-.35*	<b>-.37</b>	-.14	<b>-.60</b>	-.09	-.09	.27*
A3	<b>-.78</b>	<b>.51</b>	-.29*	.15	-.28*	.05	<b>-.37</b>	<b>-.48</b>	.08	<b>.45</b>	-.11	-.31*	<b>.63</b>	.21*
A4	<b>-.71</b>	.35*	-.27*	.17	-.25*	-.22*	-.33	<b>-.62</b>	-.34*	-.07	-.36	-.04	.30*	.31*
A5	<b>-.53</b>	.30*	-.36*	.08	.33*	-.16	-.30	<b>-.49</b>	<b>-.37</b>	-.02	<b>-.65</b>	.19	.09	.29*
A6	<b>-.57</b>	<b>.54</b>	<b>-.44</b>	.26	-.31*	.06	.16	<b>-.47</b>	.00	.20	-.09	-.09	<b>.47</b>	.29*
C1	<b>.42</b>	<b>.48</b>	-.07	.00	-.24*	-.09	.12	<b>-.40</b>	.29*	<b>.45</b>	-.08	-.14	.20*	<b>.42</b>
C2	-.01	.29	-.08	.07	-.10	.09	.34*	.06	.37	.37	-.03	-.21*	.08	.29*
C3	<b>-.52</b>	.09	-.21*	-.10	-.26*	-.27*	.00	-.30*	-.23*	-.03	<b>-.37</b>	.22*	-.06	.11
C4	-.32*	.29*	-.04	-.10	-.25*	.01	.22*	-.21*	.28*	<b>.42</b>	-.06	-.30*	.15	.35*
C5	<b>-.49</b>	<b>.49</b>	-.19	.03	-.22*	-.12	-.03	<b>-.38</b>	.24*	<b>.53</b>	-.10	-.31*	<b>.38</b>	<b>.38</b>
C6	<b>-.57</b>	.27*	<b>-.38</b>	.15	<b>-.40</b>	-.22*	.00	<b>-.41</b>	-.05	.14	<b>-.47</b>	-.03	.10	.34*

∞

Table 1 (continued).

	Veng- eance	Help Others	Food	Rejection Pain	Sex	Order	Frustration	Independ- ence	Curiosity	Attention	Anxiety	Social Contact	Morality	
N	<b>.56</b>	-.27*	.12	.29*	<b>.42</b>	.05	.19	<b>.52</b>	-.07	-.34*	.15	<b>.44</b>	-.32*	-.29*
E	-.35*	<b>.46</b>	-.01	-.15	-.06	.23*	-.13	-.18	.34*	<b>.55</b>	<b>.48</b>	<b>-.55</b>	<b>.70</b>	.21*
O	-.10	.27*	.16	-.09	-.16	.23	-.21	-.30*	.30*	<b>.50</b>	.19	-.32*	.36*	.10
A	<b>-.83</b>	<b>.48</b>	<b>-.37</b>	.13	<b>-.45</b>	-.13	<b>-.37</b>	<b>-.62</b>	-.21*	.18	<b>-.39</b>	-.17	<b>.43</b>	.35*
C	<b>-.54</b>	<b>.43</b>	-.25*	.02	-.34*	-.14	.14	<b>-.37</b>	.19	<b>.40</b>	-.26*	-.15	.20	<b>.42</b>

NOTE: Values marked with an asterisk (\*) are statistically significant at  $p < .05$ ; values in bold are statistically significant at  $p < .01$ .

## Hypothesis 2

This set of analyses examined the relative contributions of personality and personality disorder in accounting for adaptive functioning, over and above IQ, with the hypothesis that general personality functioning and personality disorder would demonstrate a significant increment in predicting adaptive functioning variance, over and above IQ. First, the personality trait and personality disorder variables were correlated with the respective measure of adaptive functioning. These results are provided in Tables 2-4. Then, the personality and personality disorder variables that obtained a statistically significant bivariate correlation were entered into a regression equation for each dependent variable to determine if the significance held after accounting for IQ. In cases wherein there was substantial multicollinearity among the personality variables, the personality variables which were consistent with previous pilot study research (Boyd, 2012) were selected.

With respect to ICAP Total Service Score, the NEO PI-R predictor (Self-Discipline) accounted for a statistically significant increase in  $R^2$  when entered in a hierarchical regression after IQ ( $\Delta$  in  $R^2 = .05, p = .03$ ). Only one Reiss motive obtained a statistically significant correlation with ICAP Service Score (Pain), and this motive did account for a statistically significant increase in incremental validity when entered in a hierarchical regression after IQ ( $\Delta$  in  $R^2 = .19, p = .003$ ). None of the SAP scales were significantly correlated with ICAP Total Service Score; therefore they were not included in the hierarchical regressions.

The same analyses were completed for each of the other dependent variables in turn. For ICAP Social Skills and Communication, the NEO PI-R predictor (Activity) did not account for a statistically significant increase in  $R^2$  when entered in a hierarchical regression after IQ ( $\Delta$  in  $R^2 = .01, p = .33$ ). The three Reiss motive predictors (Help Others, Rejection, Morality) did not account for a statistically significant increase in  $R^2$  over IQ, however ( $\Delta$  in  $R^2 = .02, p = .99$ ). The SAP scale predictors (Histrionic and Schizotypal) also did not account for a statistically significant increase in  $R^2$  over IQ ( $\Delta$  in  $R^2 = .04, p = .25$ ).

With regard to the ICAP Maladaptive Behavior scale, the NEO PI-R predictors of Compliance and Self-Discipline accounted for a statistically significant increase in  $R^2$  when entered in a hierarchical regression after IQ ( $\Delta$  in  $R^2 = .21, p < .001$ ). No Reiss motives produced statistically significant correlations with the ICAP Maladaptive Behavior scale, so no analyses were performed. The SAP scale predictors (Paranoid, Antisocial, Histrionic, Borderline, and Narcissistic) also did not account for a statistically significant increase in  $R^2$  over IQ ( $\Delta$  in  $R^2 = .02, p = .99$ ).

## Hypothesis 3

Axis I symptoms were examined via three dependent variables: total score on the PAS Checklist, number of psychiatric diagnoses listed in the individual's agency records, and number of psychotropic medications being prescribed to the individual. For these analyses, it was predicted that general personality traits and personality disorder would account for a significant amount of variance in Axis I symptoms, over and above IQ. NEO PI-R facets, Reiss motives, and personality disorder scores were first correlated with each of the Axis I variables (results provided in Tables 2-4). Personality traits and disorders that obtained a statistically significant bivariate correlation were then entered into a regression equation. In cases wherein there was substantial multicollinearity among the personality variables, the personality variables which were consistent with previous pilot study research (Boyd, 2012) were selected. For example, this occurred concerning the number of psychotropic meds prescribed—both Compliance and Tendermindedness were correlated with this dependent variable, but they were also highly

Table 2. Bivariate correlations between NEO PI-R domains/facets and dependent variables

	ICAP Total Service	ICAP Social Skills	ICAP Maladaptive Behavior	# of psychotropic medications	# of diagnoses	Total SAP	Total PAS
N1	-.05	.02	-.01	.00	.04	<b>.44</b>	.23*
N2	-.09	.19	<b>-.36</b>	.24*	.24*	<b>.65</b>	.25*
N3	-.11	.16	-.20	.14	-.01	<b>.29</b>	<b>.27</b>
N4	.01	.11	.17	-.01	-.07	.10	.13
N5	-.02	.15	<b>-.36</b>	.15	.18	<b>.46</b>	.12
N6	-.19	.11	-.34	.20	.16	<b>.46</b>	.22*
E1	-.02	-.06	.08	-.11	-.05	-.24*	-.08
E2	-.02	-.02	.06	.06	.05	-.15	-.02
E3	.03	.02	-.18	.06	.01	.25*	.19
E4	.05	-.23*	-.03	-.17	-.13	.01	.15
E5	.04	-.18	-.13	.05	-.00	.18	.05
E6	.00	-.07	-.01	-.05	-.05	-.14	.18
O1	-.14	-.16	-.16	.19	.16	.19	.18
O2	-.04	.05	.07	-.17	-.22	-.05	.12
O3	-.11	.04	-.16	.09	.01	.20	.21*
O4	-.09	-.03	-.17	-.04	.03	-.01	-.03

Table 2 (continued).

	ICAP Total Service	ICAP Social Skills	ICAP Maladaptive Behavior	# of psychotropic medications	# of diagnoses	Total SAP	Total PAS
O5	.03	-.04	.01	.01	.02	.04	.26*
O6	.09	.25*	.00	.05	.09	-.14	-.09
A1	-.03	-.09	.05	-.17	-.14	<b>-.51</b>	-.24*
A2	.04	-.05	.26*	-.17	-.14	<b>-.46</b>	-.16
A3	.03	-.05	.22*	-.06	-.12	<b>-.29</b>	-.19
A4	.08	-.07	<b>.39</b>	<b>-.32</b>	-.18	<b>-.51</b>	-.25*
A5	.11	.10	.15	-.03	-.00	<b>-.44</b>	-.11
A6	-.09	.07	.21*	-.23*	-.11	<b>-.32</b>	-.12
C1	.11	.06	.22*	-.15	.02	-.22*	.01
C2	.20*	.14	<b>.28</b>	-.18	-.08	-.18	.01
C3	.10	-.10	.26*	-.24*	-.19	<b>-.32</b>	-.14
C4	.14	.18	<b>.27</b>	-.20	-.12	<b>-.28</b>	.05
C5	.22*	.08	<b>.37</b>	<b>-.29</b>	-.14	<b>-.44</b>	-.16
C6	.09	.04	<b>.31</b>	-.17	-.13	<b>-.47</b>	-.11

Table 2 (continued).

	ICAP Total Service	ICAP Social Skills	ICAP Maladaptive Behavior	# of psychotropic medications	# of diagnoses	Total SAP	Total PAS
N	-.11	.15	<b>-.30</b>	.20	.14	<b>.60</b>	<b>.30</b>
E	.03	-.12	-.05	-.03	-.04	-.04	.13
O	-.09	.00	-.12	.05	.00	.19	.26*
A	.04	-.03	<b>.29</b>	-.24*	-.14	<b>-.56</b>	<b>-.24*</b>
C	.18	.08	<b>.36</b>	-.26*	-.13	<b>-.41</b>	-.08

NOTE: Values marked with an asterisk (\*) are statistically significant at  $p < .05$ ; values in bold are statistically significant at  $p < .01$ .

Table 3. Bivariate correlations between Reiss Profile MR/DD motives and dependent variables

	ICAP Total Service	ICAP Social & Communication	ICAP Behavior	# Meds	# Dx	Total SAP	Total PAS
Vengeance	-.02	.01	-.14	.27*	.13	<b>.54</b>	<b>.32</b>
Help Others	.11	.27*	-.03	.07	.37*	-.20	-.23
Food	-.04	-.07	-.14	.01	-.04	.31	.08
Rejection	-.04	<b>.32</b>	-.01	.03	-.02	.13	-.10
Pain	.27*	.07	.15	.16	-.02	<b>.56</b>	.15
Sex	-.01	.09	.05	.23	.22	.13	-.03
Activity	.06	.22	.08	-.10	-.06	-.25	-.04
Order	-.06	.07	-.11	-.09	-.13	<b>.33</b>	.28*
Frustration	-.11	-.03	-.20	.23	.01	<b>.55</b>	.18
Independence	.10	.17	.08	-.03	-.11	.11	.04
Curiosity	.02	.26	.02	.05	.02	-.08	-.22
Attention	.02	.05	-.06	-.07	.01	<b>.39</b>	.01
Anxiety	.13	.03	.09	-.13	-.13	.24	-.10
Social Contact	.05	.22	.05	.00	-.04	-.15	<b>-.35</b>
Morality	.15	<b>.34</b>	.06	-.16	<b>.28</b>	<b>-.45</b>	-.16

Table 4. Bivariate correlations between SAP scales and dependent variables.

	Paranoid	Schizoid	Antisocial	Borderline	Histrionic	OCPD	Avoidant	Dependent	Narcissistic	Schizotypal	Total SAP score
ICAP service	-.05	-.07	-.16	-.13	-.11	-.02	-.05	-.07	-.09	-.03	-.10
ICAP social	.13	-.13	-.11	-.03	-.22*	-.04	-.04	-.11	.03	-.24*	-.09
ICAP behavior	<b>-.29</b>	-.16	<b>-.47</b>	<b>-.42</b>	<b>-.27</b>	-.18	.13	.00	-.26*	-.14	<b>-.32</b>
Number meds	.25*	.01	<b>.38</b>	<b>.27</b>	.12	.15	-.04	-.11	.19	.05	.21
Number dx	<b>.28</b>	.10	<b>.34</b>	<b>.31</b>	.09	.21	.01	-.08	.21*	.13	.23*

NOTE: Values marked with an asterisk (\*) are statistically significant at  $p < .05$ ; values in bold are statistically significant at  $p < .01$ .

correlated with one another (expected given that they are both facets of Agreeableness;  $r = .47, p < .001$ ). Additionally, Angry Hostility was correlated with both the dependent variable and Compliance. Because the facet of Compliance emerged as a significant predictor for multiple dependent variables in the pilot study, Compliance was selected, and Angry Hostility and Tendermindedness were discarded. For each of these dependent variables, the incremental validity of NEO PI-R facets, Reiss motives, and personality disorder (as measured by total scores on the SAP) over and above IQ was examined using hierarchical regression.

For the total PAS Checklist score, the NEO PI-R facet predictor of Depression did not achieve significant incremental validity over IQ ( $\Delta \text{ in } R^2 = .04, p = .06$ ). The Reiss motive predictors of Helping Others and Morality also did not achieve incremental validity over IQ ( $\Delta \text{ in } R^2 = .14, p = .05$ ). Total score on the SAP, however, did achieve incremental validity over IQ ( $\Delta \text{ in } R^2 = .08, p = .008$ ).

For the number of psychiatric diagnoses, the NEO PI-R predictor of Angry Hostility did not account for a statistically significant increase in  $R^2$  when entered in a hierarchical regression after IQ ( $\Delta \text{ in } R^2 = .04, p = .06$ ). The Reiss motive predictors of Help Others and Morality did not account for a statistically significant increase in  $R^2$  over IQ ( $\Delta \text{ in } R^2 = .14, p = .05$ ). The SAP scale predictors (Paranoid, Antisocial, Obsessive-Compulsive, Narcissistic, and Borderline) accounted for a statistically significant increase in  $R^2$  over IQ ( $\Delta \text{ in } R^2 = .19, p = .004$ ).

For the number of psychotropic medications prescribed, the NEO PI-R predictors of Compliance and Self-Discipline accounted for a statistically significant increase in  $R^2$  when entered in a hierarchical regression after IQ ( $\Delta \text{ in } R^2 = .10, p = .01$ ). The SAP scale predictors (Paranoid, Antisocial, and Borderline) also accounted for a statistically significant increase in  $R^2$  over IQ ( $\Delta \text{ in } R^2 = .15, p = .003$ ). The Reiss motive predictor of Vengeance also accounted for a statistically significant increase in  $R^2$  over IQ ( $\Delta \text{ in } R^2 = .10, p = .04$ ).

#### **Hypothesis 4**

Hypothesis 4 concerns the incremental validity achieved by personality-related predictors over and above IQ and personality disorder symptomology when accounting for adaptive functioning and Axis I psychopathology, with the prediction that this increment would be statistically significant.

The ICAP scales were used as the adaptive functioning dependent variables. For ICAP Total Service Score, the NEO PI-R predictor of Self-Discipline did not achieve statistically significant incremental validity over and above IQ and total SAP score ( $\Delta \text{ in } R^2 = .03, p = .11$ ; see Table 5); however, the Reiss motive predictor of Pain did ( $\Delta \text{ in } R^2 = .38, p = .002$ ; see Table 6). With respect to ICAP Social Skills and Communication, the NEO PI-R predictors achieved incremental validity over IQ and total SAP score ( $\Delta \text{ in } R^2 = .08, p = .01$ ; see Table 7); the Reiss motive predictors of Help Others, Rejection, and Morality did not ( $\Delta \text{ in } R^2 = .13, p = .90$ ; see Table 8). For the ICAP Maladaptive Behavior Index, the NEO PI-R predictors of Compliance and Self-Discipline achieved incremental validity over IQ and total SAP score ( $\Delta \text{ in } R^2 = .09, p = .01$ ; see Table 9); no Reiss motives obtained significant correlations with the ICAP Maladaptive Behavior scale, therefore no regression analyses were conducted.

The PAS Checklist total score, number of psychiatric diagnoses, and number of psychotropic medications were used as measures of Axis I psychopathology. For the PAS Checklist, the NEO PI-R predictor Depression achieved incremental validity over IQ and SAP total score ( $\Delta \text{ in } R^2 = .05, p = .04$ ; see Table 10), but the Reiss motives predictors of Vengeance and Social Contact did not ( $\Delta \text{ in } R^2 = .23, p = .09$ ; see Table 11). With respect to the number of

Table 5. Hierarchical regression of ICAP Total Service Score; Reiss predictors entered in last step.

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
IQ	-.14	.52	-.03	-.27	.53	-.06	.48	.22	.30
SAP total score	-.15	.16	-.10	-.01	.18	-.01	-.25	.08	-.52
Self-Discipline				14.25	8.84	.20	-.50	4.40	-.02
Pain							12.24	3.52	.53
Total R <sup>2</sup>		.01			.04			.39	
$\Delta$ in R <sup>2</sup>		--			.03			.35	
<i>p</i> of $\Delta$ in R <sup>2</sup>		--			.11			.99	

Table 6. Hierarchical regression of ICAP Total Service Score; NEO PI-R predictors entered in last step.

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
IQ	-.14	.52	-.03	.47	.21	.29	.48	.22	.30
SAP total score	-.15	.16	-.10	-.25	.07	-.51	-.25	.08	-.52
Pain				12.27	3.46	.53	12.24	3.52	.53
Self-Discipline							-.50	4.40	-.02
Total R <sup>2</sup>		.01			.38			.38	
$\Delta$ in R <sup>2</sup>		--			.37			.00	
<i>p</i> of $\Delta$ in R <sup>2</sup>		--			.002			.99	

Table 7. Hierarchical regression of ICAP Social Skills and Communication; Reiss predictors entered in last step

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
IQ	1.29	.25	.51	1.24	.25	.49	.76	.31	.38
SAP total score	-.09	.08	-.11	-.10	.08	-.12	-.19	.10	-.32
Activity				-3.93	3.59	-.11	-5.77	4.04	-.23
Help Others							-0.04	5.45	-.01
Rejection							2.63	6.32	.08
Morality							2.05	7.71	.05
Total R <sup>2</sup>		.27			.28			.43	
$\Delta$ in R <sup>2</sup>		--			.01			.15	
<i>p</i> of $\Delta$ in R <sup>2</sup>		--			.28			.99	

Table 8. Hierarchical regression of ICAP Social Skills and Communication; NEO PI-R predictors entered in last step.

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
IQ	1.29	.25	.51	.86	.30	.43	.76	.31	.38
SAP total score	-.09	.08	-.11	-.21	.10	-.34	-.19	.10	-.32
Help Others				.76	5.51	.02	-.04	5.45	-.01
Rejection				6.47	5.80	.19	2.63	6.32	.08
Morality				-.72	7.58	-.02	2.05	7.71	.05
Activity							-5.77	4.04	-.23
Total R <sup>2</sup>		.27			.39			.43	
$\Delta$ in R <sup>2</sup>		--			.13			.04	
<i>p</i> of $\Delta$ in R <sup>2</sup>		--			.99			.16	

Table 9. Hierarchical regression of ICAP Maladaptive Behavior on IQ, total SAP score, and NEO PI-R predictors.

Variable	Step 1			Step 2		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
IQ	.03	.09	.04	.04	.09	.05
SAP total score	-.09	.03	-.32	-.03	.03	-.11
Compliance				3.04	1.38	.26
Self-Discipline				2.41	1.56	.18
Total R <sup>2</sup>		.10			.19	
$\Delta$ in R <sup>2</sup>		--			.09	
<i>p</i> of $\Delta$ in R <sup>2</sup>		--			.01	

Table 10. Hierarchical regression of Psychiatric Assessment Schedule Checklist, Reiss predictors entered in last step.

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
IQ	-.01	.07	-.015	-.01	.07	-.01	-.12	.10	-.18
SAP total score	.07	.02	.30	.05	.02	.23	.03	.04	.15
Depression				2.71	1.32	.23	1.02	2.26	.08
Order							1.14	1.89	.10
Vengeance							1.15	2.01	.11
Social Contact							-3.49	1.68	-.32
Total R <sup>2</sup>		.09			.14			.33	
$\Delta$ in R <sup>2</sup>		--			.05			.19	
<i>p</i> of $\Delta$ in R <sup>2</sup>		--			.04			.62	

Table 11. Hierarchical regression of the Psychiatric Assessment Schedule Checklist, NEO PI-R predictors entered in last step.

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
IQ	-.01	.07	-.015	-.12	.10	-.18	-.12	.10	-.18
SAP total score	.07	.02	.30	.03	.04	.18	.03	.04	.15
Order				1.14	1.89	.10	1.14	1.89	.10
Vengeance				1.15	2.01	.13	1.15	2.01	.11
Social Contact				-3.49	1.69	-.33	-3.49	1.68	-.32
Depression							1.02	2.26	.08
Total R <sup>2</sup>		.09			.32			.33	
$\Delta$ in R <sup>2</sup>		--			.23			.01	
<i>p</i> of $\Delta$ in R <sup>2</sup>		--			.09			.65	

psychiatric diagnoses, the NEO PI-R predictor of Angry Hostility did not achieve incremental validity over and above IQ and SAP total score ( $\Delta$  in  $R^2 = .01, p = .59$ ; see Table 12); whereas the Reiss motive predictors of Help Others and Morality did not ( $\Delta$  in  $R^2 = .08, p = .71$ ; see Table 13). Lastly, for the number of psychotropic medications prescribed, the NEO PI-R predictors of Compliance and Self-Discipline obtained statistically significant incremental validity over IQ and SAP total score ( $\Delta$  in  $R^2 = .10, p = .01$ ; see Table 14); The Reiss motive predictor of Vengeance did not ( $\Delta$  in  $R^2 = .08, p = .12$ ; see Table 15).

### **Hypothesis 5**

Hypothesis five concerns the additional variance accounted for by the NEO PI-R and Reiss motives, respectively, over and above IQ, personality disorder symptoms, and each other, with the prediction that the NEO PI-R would likely outperform the Reiss profile overall. To that end, hierarchical regressions were utilized for each dependent variable (adaptive functioning and Axis I symptomatology), entering IQ and SAP total score in step one, then entering the Reiss motive predictors in step two, then entering the NEO PI-R predictors in step three. After these analyses were completed, the order of the general personality predictors was reversed (i.e., NEO PI-R predictors were entered in step two and Reiss motive predictors entered in step three).

The only set of general personality predictors that achieved incremental validity over all other predictors (IQ, personality disorder, and other general personality traits) for any dependent variable was the set of NEO PI-R predictors utilized to predict the number of psychotropic medications prescribed (step three  $\Delta$  in  $R^2 = .28, p = .026$ ; see table 15).

### **Hypothesis 6**

Hypothesis six predicted that the pattern of correlations between the SAP PD scales and the NEO PI-R facets would largely mirror the findings of Samuel and Widiger (2008) meta-analysis of 16 studies (18 samples) of intellectual typical individuals. Overall, the pattern of correlations obtained between NEO PI-R facets and SAP personality disorder scales is consistent with the findings of Samuel and Widiger. For example: In this sample of adults with ID, Dependent PD obtained significant correlations with Anxiety, Depression, Self-Consciousness, Vulnerability to Stress, Openness to Fantasy, and Openness to Feelings (see Table 16 for detailed results), whereas in Samuel and Widiger (2008), Dependent PD obtained a significant effect size in relation to Anxiety, Depression, Self-Consciousness, Vulnerability to Stress, Assertiveness, Competence, and Self-Discipline. When the results of the Samuel and Widiger (2008) meta-analysis were correlated with the correlations between SAP PD scales and NEO PI-R facets from this study, the results showed good convergent validity and mixed divergent validity (see Table 17 for detailed results). Given diagnostic overlap between the DSM-IV PDs (Widiger & Trull, 2007), it is not surprising to see several significant correlations across PDs. For example, in this sample, the pattern of correlations between NEO facets and the SAP Borderline PD scale obtained a high correlation with the Samuel and Widiger results for Borderline PD ( $r = .87, p < .001$ ) as well as Antisocial PD ( $r = .86, p < .001$ ), Paranoid PD ( $r = .78, p < .001$ ), Schizotypal ( $r = .74, p < .001$ ), Narcissistic PD ( $r = .74, p < .001$ ), Avoidant ( $r = .48, p = .006$ ), and Dependent ( $r = .51, p = .003$ ). The SAP Obsessive-Compulsive PD scale did not significantly correlate with Samuel and Widiger's results ( $r = .17, p = .38$ ). The SAP Obsessive-Compulsive PD scale is the only SAP PD scale that did not obtain a statistically significant correlation with its corresponding Samuel and Widiger PD result.

Copyright Sara E. Boyd 2013

Table 12. Hierarchical regression of number of psychiatric diagnoses, Reiss predictors entered last.

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
IQ	.01	.01	.15	.01	.01	.14	< .01	.02	.02
SAP total score	.01	.01	.23	.01	.01	.17	< .01	.01	.08
Angry Hostility				.10	.19	.08	.15	.36	.10
Help Others							.57	.29	.38
Morality							-.65	.42	-.35
Total R <sup>2</sup>		.07			.08			.16	
$\Delta$ in R <sup>2</sup>		--			.01			.08	
<i>p</i> of $\Delta$ in R <sup>2</sup>		--			.59			.75	

Table 13. Hierarchical regression of number of psychiatric diagnoses, NEO PI-R predictors entered in last step.

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
IQ	.01	.01	.15	.01	.01	.24	< .01	.02	.02
SAP total score	.01	.01	.23	.01	.01	.15	< .01	.01	.08
Help Others				.56	.27	.37	.57	.29	.38
Morality				-.70	.39	-.38	-.65	.42	-.35
Angry Hostility							.15	.36	.10
Total R <sup>2</sup>		.07			.15			.16	
$\Delta$ in R <sup>2</sup>		--			.08			.01	
<i>p</i> of $\Delta$ in R <sup>2</sup>		--			.71			.68	

Table 14. Hierarchical regression of number of psychotropic medications, Reiss motives entered in last step.

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
IQ	< .01	.02	< .01	< .01	.02	-.02	-.02	.03	-.13
SAP total score	.01	.01	.21	< .01	< .01	< .01	< .01	.01	.03
Compliance				-.56	.23	-.29	-.74	.57	-.29
Self-discipline				-.34	.27	-.16	-.12	.55	-.04
Vengeance							.16	.60	.06
Total R <sup>2</sup>		.04			.15			.17	
$\Delta$ in R <sup>2</sup>		--			.11			.02	
<i>p</i> of $\Delta$ in R <sup>2</sup>		--			.01			.99	

Table 15. Number of psychotropic medications, NEO PI-R predictors entered in last step.

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
IQ	< .01	.02	< .01	-.03	.26	-.18	-.02	.03	-.13
SAP total score	.01	.01	.21	.01	.01	.12	< .01	.01	.03
Vengeance				.59	.51	.23	.16	.60	.06
Compliance							-.74	.58	-.29
Self-discipline							-.12	.55	-.04
Total R <sup>2</sup>		.04			.13			.17	
$\Delta$ in R <sup>2</sup>		--			.08			.04	
<i>p</i> of $\Delta$ in R <sup>2</sup>		--			.12			.42	

Table 16. Bivariate correlations between NEO PI-R facets/domains and the Standardized Assessment of Personality.

	Paranoid	Schizoid	Antisocial	Borderline	Histrionic	OCPD	Avoidant	Dependent	Narcissistic	Schizotypal	Total SAP
N1	<b>.35</b>	.21	.13	<b>.45</b>	<b>.29</b>	.18	<b>.26</b>	<b>.37</b>	.12	<b>.29</b>	<b>.45</b>
N2	<b>.64</b>	<b>.33</b>	<b>.55</b>	<b>.66</b>	<b>.42</b>	<b>.42</b>	.22	.15	<b>.54</b>	<b>.31</b>	<b>.65</b>
N3	<b>.30</b>	.24	.08	<b>.35</b>	.13	.12	.22	<b>.26</b>	.05	.12	<b>.29</b>
N4	.16	-.03	-.15	.14	.02	-.03	<b>.32</b>	<b>.35</b>	<b>-.28</b>	.15	.10
N5	<b>.44</b>	.08	<b>.54</b>	<b>.56</b>	.43	.15	.00	.19	.44	.17	<b>.46</b>
N6	<b>.46</b>	.30	.32	<b>.52</b>	.27	.09	.29	<b>.32</b>	.26	.16	<b>.46</b>
E1	-.21	-.48	-.04	-.13	.19	-.10	-.24	.09	-.16	<b>-.27</b>	-.24*
E2	-.20	-.39	.09	-.07	.17	-.21	-.11	.11	-.04	-.12	-.15
E3	<b>.27</b>	.03	<b>.32</b>	.16	.26	.21	-.17	-.19	<b>.45</b>	.04	<b>.25</b>
E4	-.07	-.04	.14	.08	.08	.07	-.09	-.08	.12	.08	.01
E5	.05	-.16	.30	.11	.39	.16	-.09	-.04	.37	-.02	.18
E6	-.13	-.40	.06	.00	.27	-.06	-.28	.04	-.07	-.10	-.14
O1	.29	.01	.28	<b>.40</b>	.38	.21	.12	<b>.28</b>	.22	.22	<b>.39</b>
O2	-.11	-.16	-.10	.00	.14	.01	-.06	.12	-.01	-.02	-.05
O3	.31	-.09	.31	<b>.40</b>	.39	.06	.06	.23	.21	.11	<b>.30</b>
O4	-.07	-.02	.12	.03	.04	-.09	-.10	-.08	.04	.02	-.01

Table 16 (continued).

	Paranoid	Schizoid	Antisocial	Borderline	Histrionic	OCPD	Avoidant	Dependent	Narcissistic	Schizotypal	Total SAP
O5	.04	-.04	-.08	.14	.04	.18	-.08	.05	.02	.04	.04
O6	.01	-.24	.07	.07	-.11	-.30	-.24	-.16	-.06	-.08	-.14
A1	<b>-.53</b>	-.43	-.25	-.44	-.12	-.24	-.29	-.08	-.40	-.35	<b>-.51</b>
A2	<b>-.36</b>	-.16	-.53	-.41	-.45	-.25	.01	.03	-.62	-.14	<b>-.46</b>
A3	<b>-.31</b>	-.42	-.20	-.24	.00	-.14	-.14	.12	-.40	-.18	<b>-.29</b>
A4	<b>-.55</b>	-.25	<b>-.51</b>	<b>-.53</b>	<b>-.32</b>	<b>-.35</b>	-.02	.04	<b>-.55</b>	-.22	<b>-.51</b>
A5	<b>-.23</b>	-.19	-.37	-.21	-.45	-.32	-.12	-.08	-.62	-.12	<b>-.44</b>
A6	<b>-.27</b>	-.44	-.20	-.23	-.09	-.25	-.17	.05	-.32	-.26	<b>-.32</b>
C1	-.11	-.21	-.27	-.21	-.13	.06	-.09	-.07	-.21	-.11	-.22*
C2	-.09	-.13	-.29	-.14	-.16	.08	-.03	-.10	-.16	-.09	-.18
C3	<b>-.29</b>	-.11	-.38	-.25	-.35	-.07	-.01	.06	-.44	-.12	<b>-.32</b>
C4	-.14	-.27	-.26	-.19	-.21	.04	-.16	-.10	-.19	-.19	<b>-.28</b>
C5	<b>-.31</b>	-.31	-.41	-.38	-.33	-.12	-.23	-.21	-.39	-.22	<b>-.44</b>
C6	<b>-.29</b>	-.20	<b>-.56</b>	-.44	-.43	-.19	-.09	-.13	-.48	-.20	<b>-.47</b>

Table 16 (continued).

	Paranoid	Schizoid	Antisocial	Borderline	Histrionic	OCPD	Avoidant	Dependent	Narcissistic	Schizotypal	Total SAP
N	<b>.60</b>	<b>.29</b>	<b>.40</b>	<b>.67</b>	<b>.40</b>	.25*	<b>.33</b>	<b>.38</b>	<b>.32</b>	<b>.29</b>	<b>.60</b>
E	-.07	<b>-.41</b>	.22*	.03	<b>.35</b>	.02	<b>-.28</b>	-.02	.17	-.12	-.04
O	.15	-.14	.16	<b>.32</b>	<b>.29</b>	.08	-.07	.17	.14	.10	.19
A	<b>-.51</b>	<b>-.40</b>	<b>-.47</b>	<b>-.47</b>	<b>-.33</b>	<b>-.34</b>	-.15	-.02	<b>-.65</b>	<b>-.27</b>	<b>-.56</b>
C	<b>-.26</b>	<b>-.26</b>	<b>-.47</b>	<b>-.34</b>	<b>-.34</b>	-.05	-.13	-.11	<b>-.40</b>	-.19	<b>-.41</b>

NOTE: Values marked with an asterisk (\*) are statistically significant at  $p < .05$ ; values in bold are statistically significant at  $p < .01$ .

Table 17. Correlated correlations between Samuel & Widiger (2008) and ID sample.

	SW Paranoid	SW Schizoid	SW Antisocial	SW Borderline	SW Histrionic	SW OCPD	SW Avoidant	SW Dependent	SW Narcissistic	SW Schizotypal
<b>SAP scales</b>										
Paranoid	<b>.84</b>	<b>.50</b>	<b>.80</b>	<b>.86</b>	.21	.06	<b>.53</b>	<b>.49</b>	<b>.75</b>	<b>.77</b>
Schizoid	<b>.71</b>	<b>.62</b>	.43*	<b>.68</b>	-.17	.17	<b>.60</b>	<b>.53</b>	.33	<b>.69</b>
Antisocial	<b>.52</b>	.06	<b>.91</b>	<b>.67</b>	<b>.57</b>	<b>-.48</b>	.13	.26	<b>.80</b>	.45*
Borderline	<b>.78</b>	.42*	<b>.86</b>	<b>.87</b>	.28	-.21	<b>.48</b>	<b>.51</b>	<b>.75</b>	<b>.75</b>
Histrionic	.44*	-.04	<b>.83</b>	<b>.60</b>	<b>.62</b>	<b>-.48</b>	.10	.27	<b>.78</b>	.39
OCPD	<b>.67</b>	.31	<b>.65</b>	<b>.57</b>	.27	.17	.25	.15	<b>.83</b>	<b>.65</b>
Avoidant	<b>.83</b>	<b>.75</b>	.34	<b>.79</b>	-.31	.26	<b>.85</b>	<b>.81</b>	.24*	<b>.84</b>
Dependent	<b>.57</b>	.41*	.39*	<b>.71</b>	-.05	-.12	<b>.65</b>	<b>.80</b>	.21	<b>.67</b>
Narcissistic	<b>.56</b>	.09	<b>.89</b>	<b>.62</b>	<b>.58</b>	-.32	.10	.15	<b>.92</b>	.44*
Schizotypal	<b>.85</b>	<b>.56</b>	<b>.75</b>	<b>.85</b>	.10	-.03	<b>.59</b>	<b>.53</b>	<b>.66</b>	<b>.81</b>
Total SAP	<b>.79</b>	.41*	<b>.86</b>	<b>.85</b>	.30	-.17	.46*	<b>.49</b>	<b>.79</b>	<b>.73</b>

NOTE: Values marked with an asterisk (\*) are statistically significant at  $p < .05$ ; values in bold are statistically significant at  $p < .01$ .

## Chapter Four: Discussion

There is strong and growing evidence that personality traits such as neuroticism and conscientiousness are relatively stable (Roberts & DelVecchio, 2000), heritable (Jang, McCrae, Angleitner, Reimann, & Livesley, 1998), and related to important interpersonal, quality-of-life, and occupational outcomes (Ozer & Benet-Martinez, 2006) in intellectually typical adults. There has been little examination, however, of whether or not this holds true for adults with ID. Given how much effort has been dedicated to developing theories and a body of scientific literature on personality, and no compelling reason to assume that personality must function differently in people with IQs below 70, it is sensible to evaluate the possibility that the personalities of people with ID can be understood within existing theoretical frameworks. The FFM is a particularly attractive framework, given the convincing evidence for utility in understanding both normal and maladaptive personality functioning.

In order to evaluate the suitability of the FFM for people with ID, researchers might look for the following: 1) How does the FFM relate to personality measures currently being utilized with this population? 2) How do the FFM and Reiss Profile relate to Axis I psychopathology? 3) Does the FFM within the ID population reproduce findings obtained within the intellectually typical population, with respect to personality disorder? 4) Is FFM related to important life outcomes for people with ID? This study begins to address these questions.

### Instruments for Assessing General Personality in People with ID

This study utilized the NEO PI-R and the Reiss Profile, MR/DD version as measures of personality functioning, because the NEO PI-R is the most widely-used FFM measure with an observer-rating form and because the Reiss Profile was developed specifically for use with the ID/DD population. In this study, the Reiss motives and NEO PI-R facets and domains related according to predictions (based on preliminary data collections) and in a rational fashion. For example, the Reiss motive of Vengeance obtained statistically significant correlations with NEO PI-R Neuroticism, Agreeableness, and Conscientiousness in the Olsen and Weber (2004) sample of intellectually typical undergraduates. In the Boyd (2012) sample of adults with ID, Reiss Vengeance also obtained correlations with (high) Neuroticism, (low) Agreeableness, and (low) Conscientiousness. In this sample of adults with ID, Reiss Vengeance also obtained significant correlations with NEO PI-R (high) Neuroticism, (low) Agreeableness, and (low) Conscientiousness; highest facet-level correlations were obtained with (high) Angry Hostility and (low) Altruism. It's notable that the Reiss motive of Vengeance obtained a correlation with Conscientiousness in the opposite direction (i.e., a positive correlation was obtained in the Olsen & Weber study, whereas both of the samples of adults with ID produced negative correlations). It may be that these constructs relate differently in the population of individuals with ID compared to intellectually typical individuals, but it is also the case that while the Reiss Profile MR/DD version purports to measure similar constructs, it is significantly modified from the non-ID version (i.e., Reiss Profile of Fundamental Motives).

Overall, these instruments performed comparably well with respect to their abilities to account for variance in adaptive functioning. Each instrument has its own merits. The NEO PI-R can draw upon a much larger literature and a theoretical model with substantial empirical support. However, the Reiss Profile has been utilized more widely with individuals with ID/DD, is shorter, and has items which were developed specifically to address the common concerns and life circumstances of people with ID/DD. It is important, however, not to confuse the instrument with the theory; a version of the NEO PI-R with items written to be more applicable to people with lower intellectual functioning, education, and opportunities to exercise autonomy and choice

would likely perform much better than the NEO PI-R utilized in this study. For example, the NEO PI-R contains items such as “He doesn’t take civic duties like voting very seriously” (Dutifulness). However, many state voting laws effectively prohibit individuals with ID/DD from voting, so a low endorsement of that item may in fact reflect these external limitations to exercise that right than a personality trait located within the individual. And for items like “Poetry has little or no effect on him,” (intended to assess Openness to Feelings), low endorsement rates are more likely a reflection of the cognitive ability and functional literacy of the person being rated than a lack of interest in the arts in general. The NEO-PI R could easily be modified to more accurately assess these constructs in this population. In the two examples mentioned in the foregoing, for example, items could be rephrased as “it’s important to him to keep his promises to others,” and “he enjoys artistic activities, like painting, drawing, or making music.” The scope and length of such a revision to the NEO PI-R should be determined by taking the factor structure of personality in people with ID into account as well as the utility of facets in predicting life outcomes and communicating valuable information about the individual’s unique preferences and interpersonal style. To that end, larger samples individuals with ID should be recruited in order to assess factor structure, and individuals with ID, their families, and their services providers should be included in the research development process, so that research programs can more effectively address the needs of this population and their supports.

### **Axis I psychopathology and personality functioning**

Mental illness appears to be over-represented in people with ID/DD (Matson & Shoemaker, 2011), and there is evidence that personality traits may serve to increase risk for, exacerbate the symptoms, and influence the course and outcome of, psychopathology in intellectually typical individuals (Clark, 2007; Widiger & Trull, 1992). In this sample of individuals with ID, general personality functioning significantly contributed to the prediction of Axis I disorder as measured by the SAP, number of psychiatric diagnoses recorded in the clients’ charts, and number of psychotropic medications prescribed at the time of data collection. This was true even when personality disorder and IQ were accounted for in the regression equations. Due to the small number of any particular type of Axis I disorder diagnoses available in this sample, it was not possible to examine the relations between FFM traits and specific diagnoses (e.g., generalized anxiety disorder). One should also be cautious about drawing conclusions about FFM traits and Axis I psychopathology based on the number of psychotropic medications prescribed and number of psychiatric diagnoses in the participant’s medical records. Little information was available in participants’ records regarding how diagnoses were made or the rationales for prescribing any particular medication, and psychotropic medications have been prescribed as treatments for “problematic” behavior in people with ID, as opposed to as a treatment for specific Axis I disorder (Matson & Neal, 2008). This pattern of prescribing has been criticized for years as a form of chemical restraint and as lacking in an evidence base (McGillivray & McCabe, 2004; Tsiouris, 2010)

### **General personality and personality disorder**

Personality disorder, as measured by the modified SAP, was not significantly correlated with the primary index of adaptive functioning (ICAP Service Score), but three personality disorder scales (Paranoid Antisocial, and Borderline) obtained significant correlations with the ICAP Maladaptive Behavior Index, number of psychiatric diagnoses in the participants’ charts, and number of psychotropic medications prescribed. FFM instruments, most notably the NEO PI-R, typically are designed to capture more general personality functioning variance and less maladaptive personality variance, with the exception of the FFM instruments designed for PDs (see, for example, Samuel, Riddell, Lynam, Miller, & Widiger, 2012). In this study, the NEO PI-R produced good convergent validity with respect to the pattern of relations between the FFM

facets and the personality disorder scales of the modified SAP, when these relations were compared to Samuel and Widiger's (2008) meta-analysis results. In the Samuel and Widiger study, independent weighted mean effect sizes were calculated to summarize the results of 16 studies (18 samples) of the correlations between FFM facets and DSM-IV TR PDs. In other words, for adults with ID, the FFM appears to relate to PD in a pattern largely mirroring how FFM and PD relate in the intellectually typical population. It would be worthwhile to examine, in more detail, how FFM model measures (particularly those specifically developed to capture more maladaptive variance) relate to personality disorder in individuals with ID who have received a more in-depth and multi-method assessment and diagnosis of personality disorder (for example, following Widiger's four-step diagnostic procedure).

### **FFM personality and life outcomes**

With respect to the relationship between FFM personality and life outcomes, adaptive functioning is a useful criterion because it reflects the individual's ability to independently navigate life's social, physical, communication, self-care, and psychological challenges. Within the field of intellectual disability study, adaptive functioning is evaluated and considered separately from intellectual functioning, based on the appreciation for the relatively dynamic nature of adaptive functioning and the acknowledgement that adaptive functioning is likely impacted by a number of factors in addition to IQ (Shalock et al., 2010). Impairment in adaptive functioning is a primary criterion, separate from significantly subaverage intellectual functioning, in the diagnosis of Intellectual Disability (AAIDD, 2002, p. 8). In this sample, the personality-related predictors frequently achieved a statistically significant increment in prediction of ICAP scale scores, over and above IQ. When comparing the types of personality-related predictors to one another, however (i.e., comparing NEO PI-R facets or domains to Reiss motives), it wasn't possible to clearly identify a superior measure—neither set of predictors achieved incremental validity over the other for any ICAP scale scores.

Aside from adaptive functioning as measured by the ICAP, this study examined the ability of personality to predict residential setting and vocational placement, as these variables relate to degree of community integration (i.e., a group home in a neighborhood is more integrated than a placement in a more institutional setting, just as supported employment is virtually always more integrated and less restrictive than a sheltered workshop). Community integration is an important external criterion for people with ID/DD, linked to social functioning and health, even mortality (Heller, Miller, & Hsieh, 2002). However, personality traits measured by the NEO PI-R and Reiss profile did not contribute significantly to the prediction of residential setting or vocational setting. This may be because residential and vocational placements are better explained by environmental/external factors such as family involvement, staff attitudes, and the opportunity to make choices, as these characteristics have been associated with community integration of people with ID/DD (Verdonschot, de Witte, Reichrath, Buntix, & Curfs, 2009). In circumstances where service plans were truly person-centered, that is, where service plans were developed based on the personal characteristics, needs, and preferences of the person receiving services, it is more likely that personality would figure more prominently in selection of residential and vocational supports and settings.

It is notable that the NEO PI-R Compliance, a facet within the domain of Agreeableness, emerged as a predictor across adaptive functioning- and Axis I psychopathology-related dependent variables. Compliance may be more important in group living environments and other settings where support services are provided by direct care staff (such as sheltered workshops). The size of the relations between compliance and adaptive functioning did vary between residential and vocational settings in this sample. In the largest of the residential settings, ICF-DD, the correlation between Compliance and ICAP Total Service Score was  $r = .47$  ( $p = .05$ ),

whereas in the smaller group home setting, the correlation between Compliance and ICAP Total Service Score was  $r = .08$  ( $p = .70$ ). The difference across vocational settings was less pronounced; in the least community integrated vocational setting (daytime activity center), the correlation between Compliance and ICAP Total Service Score was  $r = .44$  ( $p = .05$ ), whereas for individuals competitively employed in the community, the correlation between Compliance and ICAP Total Service Score was  $r = .33$  ( $p = .053$ ).

The relations between Compliance and adaptive functioning varied depending on the sex of the individual with ID, as well, with women also rated significantly less compliant as a group ( $t = -2.83$ ,  $p = .003$ ). This is surprising given that most studies of sex differences in the FFM have found women to be, on average, higher on Agreeableness (Costa, Terracciano, & McCrae, 2001).

### **Use of personality assessment in developing support plans for adults with ID**

It is easy to imagine how personality assessment might inform the selection of residential and vocational supports; for example, an extraverted individual might prefer a group living environment over living in a one-bedroom apartment, or he or she might be more inclined to select a residential option in a more urban area for the socialization opportunities. Some initial work is being done in this area: Personality traits of people with ID have been proposed as a variable in roommate selection for both community and institutional settings (Wiltz & Kalnins, 2008).

Aside from more narrow processes such as roommate-matching, personality assessment data has the potential to be integrated into the Person-Centered Planning (PCP) process. Person-Centered Planning is a widely-utilized team-based approach for identifying interventions and supports (such as vocational training, residential placement, and psychological or behavioral treatment) for individuals with ID. Personality assessment is likely to have practical utility for PCP, given that a hallmark of the PCP process is that “the person’s activities, services, and supports are based upon his or her dreams, interests, preferences, strengths, and capacities” (Holburn, Jacobson, Vietze, & Sersen, 2000, p. 403). Assessment of general personality functioning would provide information relevant to several of these characteristics. Future research should focus on strategies for utilizing personality data in the PCP process, while staying mindful of caveat that service providers may see personality assessment as a shortcut around meaningful consumer choice—using the personality assessment data to determine supports while ignoring the individual’s desire to choose among his or her options. Specifically, FFM personality assessment results could be utilized with the ID/DD population in ways that parallel their use with the intellectually typical population: 1) to inform the selection of career/vocational paths (see, for example, Hammond, 2001); to assist in selection among residential options (e.g., consider multiple-roommate living arrangements for extraverted, agreeable individuals) and/or roommate compatibility. This type of translational prospective study could provide guidance for community providers, families, and individuals with ID as they strive to build systems of supports that maximize both autonomy and quality of life. It is a natural next step once the validity of the use of FFM assessment of personality in people with ID is established.

### **Limitations**

This study did not include multiple ratings of the same individuals by different raters or across time, so the inter-rater and test-retest reliability of the NEO PI-R observer rating instrument for this population is unknown. Future studies should evaluate these reliability-related psychometrics of the NEO PI-R with respect to this population. Additionally, this study included only observer-report, due to concerns about low literacy and ability to discern/self-report personality in people with significantly subaverage intellectual functioning, but it would be worthwhile to investigate

methods for seeking some form of self-report of personality from the individuals with ID themselves—Lindsay and colleagues attempted this and found that self-report, even of a simplified NEO PI-R, was a substantial challenge for individuals with ID, and produced substantial inconsistencies between self- and other-report (Lindsay, Rzepecka, & Law, 2007). In this study, the observer ratings of personality came only from support staff who knew the individuals well, but their ratings may differ from the ratings that family members would have provided, and so choice of rater cannot be ruled out as a potential source of variance until different categories of raters can be compared in inter-rater reliability studies.

Lastly, future research should further evaluate the relationship between Axis I psychopathology and personality functioning, utilizing standardized, normed assessments which have some validity for this population, and multiple methods. Studies of individuals who meet criteria for Axis I and II disorders may further illuminate the role that general personality plays in the etiology, maintenance, and treatment of Axis I disorders, with potentially useful implications for clinicians who treat psychological problems in individuals with ID.

Copyright Sara E. Boyd 2013

## References

- Allik, J. (2005). Personality dimensions across cultures. *J Pers Disord*, 19(3), 212-232.
- Allik, J., & McCrae, R. R. (2004). Escapable conclusions: Toomela (2003) and the universality of trait structure. *Journal of Personality and Social Psychology*, 87(2), 261-265.
- Ashton, M. C., Lee, K., Perugini, M., Szarota, P., de Vries, R. E., Di Blas, L., et al. (2004). A six-factor structure of personality-descriptive adjectives: solutions from psycholexical studies in seven languages. *Journal of Personality and Social Psychology*, 86(2), 356-366.
- Ballinger, B. R., & Reid, A. H. (1988). Standardised assessment of personality disorders in mental handicap. *British Journal of Psychiatry*, 152, 577.
- Barrick, M. R., & Mount, M. K. (1991). The Big Five personality dimensions and job performance: a meta-analysis. *Personality Psychology*, 44, 1-26.
- Boyd, S. E. (2012). Five Factor Model personality functioning in adults with intellectual disabilities. In T.A. Widiger & P.T. Costa (Eds.), *Personality Disorders and the Five Factor Model of Personality* (3<sup>rd</sup> ed.) (pp. 209 - 217). Washington, D.C.: American Psychological Association.
- Bruininks, R. H., Hill, B. K., Weatherman, R., & Woodcock, R. W. (1986). *Inventory for Client and Agency Planning*. Chicago, IL: Riverside.
- Caspi, A., Roberts, B. W., & Shiner, R. L. (2005). Personality development: stability and change. *Annual Review of Psychology*, 56, 453-484.
- Clark, L. A. (2007). Assessment and diagnosis of personality disorder: perennial issues and an emerging reconceptualization. *Annual Review of Psychology*, 58, 227-257.
- Costa, P. T., & McCrae, R. R. (1992). *The NEO personality inventory manual*. Odessa, FL: Psychological Assessment Resources.
- Costa, P. T., Terracciano, A., & McCrae, R. R. (2001). Gender differences in personality traits across cultures: robust and surprising findings.
- Cowley, A., Holt, G., Bouras, N., Sturmey, P., Newton, J. T., & Costello, H. (2004). Descriptive psychopathology in people with mental retardation. *Journal of Nervous Mental Disorders*, 192(3), 232-237.
- Deb, S., & Hunter, D. (1991). Psychopathology of people with mental handicap and epilepsy. III: Personality disorder. *British Journal of Psychiatry*, 159, 830-834.
- Dosen, A. (2005). Applying the developmental perspective in the psychiatric assessment and diagnosis of persons with intellectual disability: part II--diagnosis. *Journal of Intellectual Disability Research*, 49(Pt 1), 9-15.
- Fletcher, R., Loschen, E., Stavrakaki, C., & First, M. (2007). Introduction. In R. Fletcher, E. Loschen, C. Stavrakaki & M. First (Eds.), *Diagnostic Manual-Intellectual Disability: A textbook of diagnoses in persons with intellectual disability*. Kingston, NY: The National Association for the Dually Diagnosed.
- Flynn, A., Matthews, H., & Hollins, S. (2002). Validity of the diagnosis of personality disorder in adults with learning disability and severe behavioural problems. Preliminary study. *British Journal of Psychiatry*, 180, 543-546.
- Grant, B. F., Hasin, D. S., Stinson, F. S., Dawson, D. A., Chou, S. P., Ruan, W. J., et al. (2004). Prevalence, correlates, and disability of personality disorders in the United States: results from the national epidemiologic survey on alcohol and related conditions. *Journal of Clinical Psychiatry*, 65(7), 948-958.
- Hammond, M.S. (2001). The use of the Five-Factor Model of Personality as a therapeutic tool in career counseling. *Journal of Career Development*, 27(3), 153-165.
- Heller, T., Miller, A. B., & Hsieh, K. (2002). Eight-year follow-up of the impact of environmental characteristics on well-being of adults with developmental disabilities. *Mental Retardation*, 40, 368-378.

- Jang, K. L., McCrae, R. R., Angleitner, A., Riemann, R., Livesley, W. J. (1998). Heritability of facet-level traits in a cross-cultural twin sample: support for a hierarchical model of personality. *Journal of Personality and Social Psychology*, 74, 1556-1565.
- Kurtz, J. E., Putnam, S. H., & Stone, C. (1998). Stability of normal personality traits after traumatic brain injury. *Journal of Head Trauma Rehabilitation*, 13(3), 1-14.
- Lahey, B. B. (2009). Public health significance of neuroticism. *American Psychologist*, 64, 241-256.
- Lannoo, E., de Deyne, C., Colardyn, F., de Soete, G., & Jannes, C. (1997). Personality change following head injury: assessment with the NEO Five-Factor Inventory. *Journal of Psychosomatic Research*, 43(5), 505-511.
- Larson, L. M., Rottinghaus, P. J., & Borgen, F. H. (2002). Meta-analyses of Big Six interests and Big Five personality factors. *Journal of Vocational Behavior*, 61, 217-239.
- Lecavalier, L., & Havercamp, S. M. (2004). Are caregivers' reports of motivation valid? reliability and validity of the Reiss Profile MR/DD. *Journal of Intellectual Disability Research*, 48(3), 217-224.
- Lidher, J., Martin, D. M., Jayaprakash, M. S., & Roy, A. (2005). Personality disorders in people with learning disabilities: follow-up of a community survey. *Journal of Intellectual Disability Research*, 49(Pt 11), 845-851.
- Lindsay, W. R., Rzepecka, H., & Law, J. (2007). An exploratory study of the use of the Five Factor Model of Personality with individuals with intellectual disabilities. *Clinical Psychology and Psychotherapy*, 14, 428-437.
- Mann, A. H., Jenkins, R., Cutting, J. C., & Cowen, P. J. (1981). The development and use of standardized assessment of normal personality. *Psychological Medicine*, 11(4), 839-847.
- Matson, J., & Neal, D. (2009). Psychotropic medication use for challenging behaviors in persons with intellectual disabilities: an overview. *Research in Developmental Disabilities*, 30, 572-586.
- Matson, J., & Shoemaker, M. E. (2011). Psychopathology and intellectual disability. *Current Opinion in Psychiatry*, 24, 367-371.
- McCrae, R. R., & Costa, P. T. (2003). *Personality in Adulthood: A Five-Factor Theory perspective*. New York: Guilford.
- McGillivray, J. A., & McCabe, M. P. (2004). Pharmacological management of challenging behavior of individuals with intellectual disability. *Research in Developmental Disabilities*, 25, 523-537.
- McKeon, J., Roa, B., & Mann, A. (1984). Life events and personality traits in obsessive-compulsive neurosis. *British Journal of Psychiatry*, 144, 185-189.
- Mervielde, I., De Clercq, B., De Fruyt, F., & Van Leeuwen, K. (2005). Temperament, personality, and developmental psychopathology as childhood antecedents of personality disorders. *Journal of Personality Disorders*, 19(2), 171-201.
- National Institutes of Health. (2001). Emotional and Behavioral Health in Persons with Mental Retardation/Developmental Disabilities. Washington, DC: U.S. Government Printing Office. Retrieved June 26, 2011 from: [http://www.ninds.nih.gov/news\\_and\\_events/proceedings/Emotional\\_Behavioral\\_Health\\_2001.htm#summaty](http://www.ninds.nih.gov/news_and_events/proceedings/Emotional_Behavioral_Health_2001.htm#summaty).
- Nezu, A. M., Nezu, C. M., & Gill-Weiss, M. J. (1992). *Psychopathology of persons with mental retardation: Clinical guidelines for assessment and treatment*. Champaign, IL: Research press.
- Olney, M. F., & Kennedy, J. (2001). National estimates of vocational service utilization and job placement rates for adults with mental retardation. *Ment Retard*, 39(1), 32-39.
- Ozer, D. J., & Benet-Martínez, V. (2006). Personality and the prediction of consequential outcomes. *Annual Review of Psychology*, 57, 401-421.

- Panek, P. E., & Wagner, E. E. (1993). Hand test characteristics of dual diagnosed mentally retarded older adults. *Journal of Personality Assessment*, 61(2), 324-328.
- Penner, L. A. (2002). Dispositional and organization differences in sustained volunteerism: an interactionist perspective. *Journal of Social Issues*, 58, 447-467.
- Pilgrim, J. A., Mellers, J. D., Boothby, H. A., & Mann, A. H. (1993). Interrater and temporal reliability of the Standardized Assessment of Personality and the influence of informant characteristics. *Psychological Medicine*, 23(3), 779-776.
- Prosser, H., Moss, S., Costello, H., Simpson, N., Patel, P., & Rowe, S. (1998). Reliability and validity of the Mini PAS-ADD for assessing psychiatric disorders in adults with intellectual disability. *Journal of Intellectual Disability Research*, 42 ( Pt 4), 264-272.
- Reiss, S., & Havercamp, S. M. (1998). Toward a comprehensive assessment of fundamental motivation: Factor structure of the Reiss Profiles. *Psychological Assessment*, 10(2), 97-106.
- Reiss, S., Levitan, G. W., & Szyszko, J. (1982). Emotional disturbance and mental retardation: diagnostic overshadowing. *American Journal of Mental Deficiency*, 86(6), 567-574.
- Roberts, B. W., & DeVecchio, W. F. (2000). The rank-order consistency of personality traits from childhood to old age: a quantitative review of longitudinal studies. *Psychological Bulletin*, 126(1), 3-25.
- Samuel, D., Riddell, A. D. B., Lynam, D., Miller, J.D., & Widiger, T. A. (2012). A five-factor measure of obsessive-compulsive personality traits. *Journal of Personality Assessment*, DOI:10.1080/00223891.2012.677885.
- Torr, J. (2003). Personality disorder in intellectual disability. *Current Opinion in Psychiatry*, 16, 517-521.
- Trull, T. J., & Sher, K. J. (1994). Relationship between the five-factor model of personality and Axis I disorders in a nonclinical sample. *Journal of Abnormal Psychology*, 103(2), 350-360.
- Tsouris, J. A. (2010). Pharmacotherapy for aggressive behaviours in persons with intellectual disabilities: treatment or mistreatment? *Journal of Intellectual Disability Research*, 54, 1-16.
- U.S. Department of Health and Human Services. (2002). Closing the Gap: A National Blueprint to Improve the Health of Persons with Mental Retardation: Report of the Surgeon General's Conference on Health Disparities and Mental Retardation. Washington, DC: U.S. Government Printing Office. Retrieved June 26, 2011 from Pubmed) at: <http://www.ncbi.nlm.nih.gov/books/NBK44346/>.
- Verdonschot, M. M., de Witte, L. P., Reichrath, E., Buntinx, W. H., & Curfs, L. M. (2009). Community participation of people with an intellectual disability: a review of empirical findings. *Journal of Intellectual Disability Research*, 53(4), 303-318.
- Verdonschot, M. M., de Witte, L. P., Reichrath, E., Buntinx, W. H., & Curfs, L. M. (2009). Impact of environmental factors on community participation of persons with an intellectual disability: a systematic review. *Journal of Intellectual Disability Research*, 53, 54-64.
- Weiss, A., & Costa, P. T. (2004). Domain and facet personality predictors of all-cause mortality among Medicaid patients aged 65 to 100. *Psychosomatic Medicine*, 67(5), 724-733.
- Widiger, T. A., De Clercq, B., & De Fruyt, F. (2009). Childhood antecedents of personality disorder: an alternative perspective. *Developmental Psychopathology*, 21(3), 771-791.
- Widiger, T. A., & Mullins-Sweatt, S. N. (2009). Five-factor model of personality disorder: a proposal for DSM-V. *Annual Review of Clinical Psychology*, 5, 197-220.
- Widiger, T.A., & Trull, T. (2007). Plate tectonics in the classification of personality disorder. *American Psychologist*, 62(2), 71-83.
- Wiltz, J., & Reiss, M. (2003). Compatibility of housemates with mental retardation. *American Journal of Mental Retardation*, 108, 173-180.

- Yamagata, S., Suzuki, A., Ando, J., Ono, Y., Kijima, N., Yoshimura, K., et al. (2006). Is the genetic structure of human personality universal? A cross-cultural twin study from North America, Europe, and Asia. *Journal of Personality and Social Psychology*, 90(6), 987-998.
- Yamaki, K., & Fujiura, G. T. (2002). Employment and income status of adults with developmental disabilities living in the community. *Mental Retardation*, 40(2), 132-141.

**SARA ELIZABETH BOYD**

Clinical Psychology  
University of Kentucky

**EDUCATION**

---

**Graduate:**

**Master of Science**, Clinical Psychology, University of Kentucky, 2010.  
Thesis title: A Comparison of the Reiss Profile and the NEO PI-R Assessment of Personality.

**Master of Science**, Counseling Psychology, University of Kentucky, 2006.

**Certificate in Developmental Disabilities**, University of Kentucky, 2005.

**Undergraduate:**

**Bachelor of Science**, Psychology, University of Illinois, August 2003.

**CLINICAL EXPERIENCE—PROFESSIONAL POSITIONS**

---

**Westchester Jewish Community Services, APA-Accredited Internship, Psychology Fellow**, Yonkers and Hartsdale, New York, July 2012 to July 2013

**Bluegrass Mental Health/Mental Retardation Board, Eastern State Hospital, Forensic/Inpatient Psychology Trainee**, Lexington, Kentucky, June 2010 to July 2011.

**University of Kentucky, Harris Psychological Services Center, Graduate Student Therapist**, Lexington, Kentucky, July 2007 to July 2011.

**University of Kentucky, Harris Psychological Services Center, Social Skills Group Co-Leader**, Lexington, Kentucky, September 2008 to December 2008.

**University of Kentucky, Harris Psychological Services Center, Assessment Coordinator**, Lexington, Kentucky, July 2007 to August 2008.

**Bluegrass Rape Crisis Center, Crisis Counselor Trainee**, Lexington, Kentucky, September 2005 to September 2006.

**Center for Women, Children, and Families, Counseling Psychology Trainee**, Lexington, Kentucky, January 2006 to May 2006.

**TEACHING & TRAINING EXPERIENCE—PROFESSIONAL POSITIONS**

---

**Westchester Jewish Community Services, Instructor**, Yonkers and Hartsdale, New York, September 2012 to present.

**University of Kentucky, University Center for Excellence in Developmental Disabilities, Curriculum Development and Project Coordinator**, Lexington, Kentucky, January 2012 to July 2012.

**University of Kentucky, Teaching Assistant**, Lexington, Kentucky, 2011.

**University of Kentucky, Human Development Institute, Instructor**, Lexington, Kentucky, 2008 to 2011.

**Migrant Network Coalition, Workshop Co-Leader**, Lexington, Kentucky, August 2010.

**University of Kentucky, Department of Behavioral Sciences, Graduate Student Trainee**, Lexington, Kentucky, August 2007 to May 2009.

**University of Kentucky, Human Development Institute, Project Supervisor**, Lexington, Kentucky, November 2007 to July 2008.

**University of Kentucky, Preservice Health Training, Project Assistant**, Lexington, Kentucky, August 2005 to June 2008.

**Project SAFE (Safety and Accessibility for Everyone), Coordinator**, Frankfort, Kentucky, September 2005 to September 2006.

**Commonwealth of Kentucky, Coalition of State Disability and Employment Agencies, Training Facilitator**, Frankfort, Kentucky, April 2005 to June 2005.

## **HONORS**

---

**2012 Research Endowment Award**, \$750, from the Human Development Institute, University of Kentucky.

**2011 Research Funding Award**, \$750, from the Department of Psychology, University of Kentucky.

**2010 Travel Award**, \$750, from the Department of Psychology, University of Kentucky.

**2008 Winner, American Psychological Association (APA) of Graduate Students ethics paper contest.**

Awarded at the APA annual conference in Boston, MA, August 2008. Paper, co-authored with Z.W. Adams, titled: Ethical Considerations in Psychotherapy with Adults with Intellectual Disabilities.

**2008 Research Funding Award**, \$500, from the Department of Psychology, University of Kentucky.

**2007 Burberry Award**, from the Human Development Institute, University of Kentucky, a University Center for Excellence in Developmental Disabilities.

This award recognizes outstanding academic achievement and advocacy efforts in graduate student trainees.

**2006 Travel Award**, \$750, from the Department of Psychology, University of Kentucky.

**2006 Anne Rudiger Award**, from the Association of University Centers on Disability (AUCD).

This national award recognizes academic and advocacy-related achievement among graduate student trainees in the AUCD network.

**1998-1999 James Scholar Honors Program**, University of Illinois.

## **PUBLICATIONS**

---

**Boyd, S. E.** (2012). Five Factor Model personality functioning in adults with intellectual disabilities. In T.A. Widiger & P.T. Costa (Eds.), *Personality Disorders and the Five Factor Model of Personality* (3<sup>rd</sup> ed.) (pp. 209 - 217). Washington, D.C.: American Psychological Association.

**Boyd, S. E., & Adams, Z.** (2010). Ethical challenges in the treatment of individuals with intellectual disabilities. *Ethics and Behavior*, 20, 407-418.

**Boyd, S., Sanders, C., Kleinert, H., Huff, M., Lock, S., Johnson, S., et al.** (2008). Virtual patient training to improve reproductive healthcare for women with intellectual disabilities. *Journal of Midwifery and Women's Health*, 53, 453-460.

Kleinert, H. K., Fisher, S., Sanders, C., & **Boyd, S.** (2007). Improving physician assistant competencies in developmental disabilities using virtual patient modules. *Journal of Physician Assistant Education*, 18, 33-40.

Kleinert, H. K., Sanders, C. B., Mink, J., Nash, D., Johnson, J., **Boyd, S., et al.** (2007). Improving student dentist competencies and comfort in delivering care to children with developmental disabilities using a virtual patient module. *Journal of Dental Education*, 71, 279-286.

Knudsen, H. K., Studts, J. L., **Boyd, S. E., & Roman, P. M.** (2010). Structural and cultural barriers to the adoption of smoking cessation services in addiction treatment organizations. *Journal of Addictive Diseases*, 29, 294-305.

Knudsen, H. K., **Boyd, S. E., Studts, J. L.** (2010). Substance abuse treatment counselors and tobacco use: a comparison of comprehensive and indoor-only smoking bans. *Nicotine and Tobacco Research*, 12, 1151-1155.

Sanders, C. L., Kleinert, H. K., Free, T. F., Slusher, I., Clevenger, K., Johnson, S., **Boyd, S. E.** (2007). Caring for children with intellectual and developmental disabilities: Virtual patient instruction improves students' knowledge and comfort level. *Journal of Pediatric Nursing*, 22, 457-466.

Sanders, C. L., Kleinert, H. K., Free, T. F., Slusher, I., Clevenger, K., **Boyd, S., et al.** (2007). Caring for children with intellectual and developmental disabilities: Virtual patient instruction improves students' knowledge and comfort level. *Journal of Pediatric Nursing*, 22, 457-466.

Sanders, C. L., Kleinert, H. K., Boyd, S. E. Herren, C., Theiss, L., & Mink, J. (2008). Virtual patient instruction for dental students: can it improve dental care access for persons with special needs? *Special Care Dentistry*, 28, 205-213.

- Sanders, C. L., Kleinert, H. K., Free, T. F., Slusher, I., Clevenger, K., **Boyd, S.**, et al. (2008). Developmental disabilities: improving competence in care using virtual patients. *Journal of Nursing Education*, 47, 66-73.
- Widiger, T. A., & **Boyd, S.** (2009). Personality disorder assessment instruments. In J. N. Butcher (Ed.), *Oxford handbook of personality assessment (3rd ed.)*(pp. 336-363). New York: Oxford University Press.
- Zurkovsky, L., Brown, S. L., **Boyd, S.**, & Korol, D. L. (2007). Estrogen modulates learning in female rats by acting directly at distinct memory systems. *Neuroscience*, 144, 26-37.