

# Pathological Personality in Relation to Multiple Domains of Quality of Life and Impairment: Evidence for the Specific Relevance of the Maladaptive Poles of Major Trait Domains

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The current study examined whether personality domains have nonmonotonic relationships with functional outcomes, specifically in relation to quality of life and impairment. Four samples were utilized, which were drawn from the United States and Germany. Personality trait domains were measured via the IPIP-NEO and PID-5; quality of life (QoL) was measured with the WHOQOL-BREF, and impairment was measured using the WHODAS-2.0. The PID-5 was analyzed in all four samples. Two-line testing, which fits two spline regression lines separated at a break point, was conducted to evaluate potential nonmonotonicity of the relationship between personality traits and quality of life. Overall, results demonstrated little support for nonmonotonic relationships in the PID-5 and IPIP-NEO dimensions. Rather, our results indicate that there is one clear pathological pole of major domains of personality that is associated with lower quality of life and increased impairment.

### General Scientific Summary

This study set out to analyze potential nonmonotonicity in relations between major forms of maladaptive personality, quality of life, and impairment. Maladaptive personality traits were related to diminished QoL and increased impairment in most domains at a single pole only, with little replicable evidence for nonmonotonic associations.

**Keywords:** PID-5, IPIP-NEO, personality domains, QoL, impairment

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Personality shapes how individuals interact with the world and is thereby closely linked to the expression and nature of psychological disorders (Fowler et al., 2017), including its definitional role in personality disorders (PDs). Traditionally, PDs were conceptualized as

putatively separate categorical diagnoses associated with a multitude of criteria. This conceptualization of PD is a disjunction from how personality is more generally conceptualized in the literature (Widiger & Simonsen, 2005). Moreover, a categorical model fails

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Kelsey Ann Hobbs served as lead for formal analysis, writing—original draft, and writing—review and editing.

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Robert F. Krueger is a coauthor of the PID-5 and provides consulting services to aid users of the PID-5 in the interpretation of test scores. PID-5 is the intellectual property of the American Psychiatric Association, and he does not receive royalties or any other compensation from publication or administration of inventory.

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to account for the co-occurrence of psychiatric diagnoses and for the underlying traits related to the pattern of pathological behaviors associated with PDs. The paradigm shift from categorical models to dimensional models has slowly made its way into official nosologies such as the DSM-5 via Section III: Emerging Measures and Models (American Psychiatric Association [APA], 2013) and ICD-11 (Reed, 2018; Tyrer et al., 2019). Furthermore, traditional personality dimensions have served as one basis for incorporating dimensional models of personality into official nosologies.

### Five-Factor Model and the Personality Inventory for the DSM-5

Well-researched normative personality models serve as the foundation for creating a trait-based model of PD. The Five-Factor Model (FFM; John et al., 2008) or Big 5 has been well researched in the literature. The FFM is considered to represent a model with five overarching personality dimensions: agreeableness versus antagonism, extraversion versus introversion, conscientiousness versus disinhibition, openness (or unconventionality), and emotional stability versus neuroticism (Widiger & McCabe, 2020). Studies of the FFM have evinced associations with a wide range of important life outcomes. Some such outcomes have included longevity, well-being, and overall quality of life (Anglim & Grant, 2016; Chapman et al., 2011). Additionally, these traits have been found to be relatively stable over time (Bleidorn et al., 2022; Roberts & DelVecchio, 2000), and increase in stability with age (Mann et al., 2021). Personality trait domains can be considered as bipolar in the sense that they are defined by indicators for both high (usually adaptive) and low (usually maladaptive) trait levels. However, it has been theorized in the literature that both poles of these domains may be related to deleterious outcomes (Carter et al., 2018; Coker et al., 2002; Leising & Zimmermann, 2011). This proposition of maladaptive bipolarity (i.e., both poles relate to maladaptive behaviors) requires further empirical study, which we sought to contribute in this project.

In 2013, the Alternative Model of Personality Disorders (AMPDs) was incorporated into the DSM-5 Section III: Emerging Measures and Models (APA, 2013). The Personality Inventory for DSM-5 (PID-5; Krueger et al., 2012) was created as part and parcel of the development of the trait model aspect of the AMPD (Criterion B). The PID-5 clearly draws on one end, typically the low maladaptive end, of the bipolar domains of the FFM (i.e., disinhibition, negative affect, detachment, and antagonism). Specifically, disinhibition is thought to represent the pathological low pole of conscientiousness, negative affect of emotional stability, detachment of extraversion, and antagonism of agreeableness. For the most part, tests of the PID-5 evinced expected relationships with the FFM domains (Gore & Widiger, 2013). In contrast, the relation of openness and psychoticism in the FFM may not be consistent across measures (Ashton & Lee, 2012; Quilty et al., 2013; Suzuki et al., 2015; Watson et al., 2008, 2019, 2013; Wright & Simms, 2014). The constructs of PID-5 psychoticism and FFM openness are neither equivalent nor bipolar opposites of one underlying trait. Specifically, FFM openness represents two aspects: intellect and creativity (DeYoung et al., 2016). Only the creativity aspect relates positively to the construct of psychoticism as represented on the PID-5 (DeYoung et al., 2016). In terms of underlying facets, only the openness facet of imagination relates to the facets found in the PID-5 psychoticism

dimension (Suzuki et al., 2015). Thus, due to the PID-5's intention of capturing purely maladaptive traits, PID-5 psychoticism may be conceived of as a maladaptive variant of high creativity or imagination.

### Latent Continua

Discussions about the information captured by personality measures and the overlap of information covered by existing measures have been ongoing (e.g., Walton et al., 2008). Previously, factor analysis and related correlation-based methods were used, which usually do not fully capture how personality domains from different measures fit onto latent personality continua. However, Item Response Theory (IRT) methods particularly focus on information about locations of indicators along latent continua and are thereby used to explore how and where adaptive and maladaptive trait indicators fall along the same latent continuum (Samuel et al., 2013). For example, Walton et al. (2008) used IRT methods to look at the Multidimensional Personality Questionnaire (MPQ) and Psychopathic Personality Inventory (PPI). They found that the MPQ and PPI were largely redundant in the coverage of the maladaptive range of personality (i.e., psychopathy). This finding suggests that some measures that are seemingly covering normal range traits (e.g., the MPQ), also extend to cover the maladaptive range of traits that are typically assessed with measures designed explicitly to index PD constructs.

To date, one study has directly investigated the dimensional hypothesis that the PID-5 domains are pathological extremes of the FFM. Suzuki et al. (2015) used IRT modeling to analyze the latent continua of the personality domains measured by the PID-5 and the IPIP-NEO. They found that PID-5 typically provides more information on the extreme low end of essentially the same domains indexed by the IPIP-NEO, while the IPIP-NEO provided more information at the higher end of the domains (Suzuki et al., 2015). This suggests that these measures are complementary and that they do have somewhat different levels of measurement precision at different points along roughly the same latent continua. Additionally, Suzuki et al. (2015) provided further evidence for the disjunction of the psychoticism versus openness domain as was measured by the PID-5 and IPIP-NEO, specifically the imagination facet of openness was the only facet that fit well with the psychoticism dimension.

### Bipolarity

While IRT methods allow for the IPIP-NEO and PID-5 trait domains to be located on the same latent continua, there has been considerable interest in understanding the empirical basis for the theoretically bipolar nature of these domains. Of particular interest has been the possibility that both ends are *functionally pathological*. However, this has rarely been the focus of empirical research with some exceptions (e.g., Bipp et al., 2020; Carter et al., 2016; Le et al., 2011; Nickel et al., 2019; Walmsley et al., 2018; Williams & Simms, 2018). We now turn to describe these studies.

Williams and Simms (2018) analyzed the shape of the association, specifically with the intent of examining bipolarity, between maladaptive personality traits and overall functioning. They found that overall, most traits did not seem to be functionally pathological at both poles, but that in some cases extraversion and agreeableness were related to worse functioning in the traditionally positive pole.

Additionally, in the instance that these traits did have worse functioning in the positive end, it was a smaller decrease in functioning than in the traditional maladaptive end.

Thus far, the industrial-organizational field of psychology has demonstrated evidence for nonlinear relationships between adaptive traits and functioning. For example, Carter et al. (2016) found that being overly conscientious was a hindrance in a workplace setting and impeded one's ability to function in the workplace. Further, Le et al. (2011) found that emotional stability and conscientiousness are nonmonotonically related to job performance in that there is a dip in performance at the extreme positive end of the continua. This phenomenon has been referred to as "too much of a good thing." Contrary to these findings, other studies have found no evidence in support of nonmonotonic associations between personality and job performance, health, well-being, job satisfaction, and academic success (Bipp et al., 2020; Nickel et al., 2019; Walmsley et al., 2018).

### Maladaptive Personality, Quality of Life, and Impairment

In the extreme range of maladaptive traits, PDs have been associated with a multitude of poor health outcomes. One study suggests that avoidant, borderline, schizotypal, schizoid, and paranoid PDs were related to large decreases in QoL (Cramer et al., 2006). In fact, having a PD was more predictive of QoL than sociodemographic variables or other psychological disorders (Cramer et al., 2006). Further, the finding that PDs are related to decreased QoL is found not only in adults, but also in adolescents (Korsgaard et al., 2015). In a study that specifically looked at QoL in women with PDs, it was found that women with PDs had lower quality of life across domains compared to women with other types of psychological disorders and compared to a control group (Kavanagh et al., 2020). Given that PDs comprise constellations of maladaptive traits, those traits likely influence QoL. The literature supports the assertion that maladaptive traits are also related to decreases in psychosocial functioning (Ro & Clark, 2013). However, regarding QoL, psychoticism as assessed by Eysenck's three-factor model, which can be thought of as a combination of low agreeableness and low conscientiousness (McCrae & Costa, 1985), exhibits no relationship with overall QoL (Steel et al., 2008).<sup>1</sup> Further, maladaptive personality traits have been associated with increased levels of impairment (Díaz-Batanero et al., 2019). Previous research has also demonstrated that those with personality disorders tend to have impairment in functioning, decreased symptom remission and recovery, and increased risk of severe psychopathology (Hengartner, 2015), suggesting a higher level of dysfunction. The present study sought to better elucidate how impairment and QoL relate to personality. To the authors' knowledge, no studies have directly looked at the relationship between the maladaptive traits represented by the PID-5 and QoL. Further, to our knowledge, no studies have explored the "too much of a good thing" hypothesis or the possibility of both ends of personality domain continua being functionally pathological as it relates to QoL and impairment.

### The Present Study

QoL and impairment have exhibited relationships with various forms of adaptive and maladaptive traits. Further, QoL and

impairment are important factors to consider when assessing how psychopathology, in this case in the form of personality pathology, is impacting an individual's life. In particular, maladaptive traits via PDs have been related to worse QoL and increased levels of impairment. We set out to understand if a decrease in QoL was associated with *both ends* of personality trait domains. Specifically, the overarching aim of the present study was to investigate nonmonotonic associations of all personality domains as assessed by the PID-5 and IPIP-NEO. We hypothesized that there would be evidence of nonmonotonic effects, with lower QoL and increased impairment observed at both ends of these domains (Widiger & Crego, 2019). We set out to examine the potential of these relations to be nonmonotonic in that the slope of the regression would experience a change in sign.

## Method

### Samples

#### Sample 1

Data were collected from the University of Minnesota's Research Experience Program. Through this program, undergraduate students receive points that can count toward extra credit. Students completed the surveys online and were told that it would take between 60 and 90 min. Of the participants, 1,835 completed the surveys. Participants below the age of 18 were removed from the study, which resulted in the removal of six participants. To be conservative during analysis, if individuals had more than 10% of data missing, they were also removed from the study, which resulted in the removal of 72 individuals. To check for validity, the PID-5 response inconsistency (VRIN; Keeley et al., 2016) and overreporting scales (ORS; Sellbom et al., 2018) were utilized. The response inconsistency scale is meant to capture excessive levels of random content-independent inconsistency within an individual's answers. The overreporting scale is meant to capture individuals who answer in an extreme manner on items that were not often endorsed by individuals with psychiatric illness. Moreover, 30 individuals were removed for being above 17 on the VRIN, and 45 were removed for being above 2 on the ORS. Thus, the final sample size was 1,682. The analytic sample ranged from 18 to 58 years old with a mean age of 20.09. The majority of the sample was female (66.59%) and European American (80.14%), and the rest of the sample was 11.07% Asian American, 3.15% African American, 0.36% Native American, and 2.56% Other race/ethnicity. Demographic information can also be found in Table S1 in the online supplemental materials.

#### Samples 2 and 3

Data for these samples were drawn from the Minnesota Twin Registry (MTR). To account for the nonindependence of results that are associated with using twin samples, Sample 2 is one-half of the twin pair and Sample 3 is the other half of the twin pair. Sample 2 and Sample 3 each consist of 1,413 individuals. If individuals had more than 10% of data missing, they were removed from the study, which resulted in the removal of 346 and 390 individuals in

<sup>1</sup> Notably, when assessed with NEO and considered independently of each other, conscientiousness and agreeableness were positively related to QoL (Steel et al., 2008).

samples 2 and 3, respectively. From Sample 2, nine individuals were removed for scoring above 17 on the PID-5 response inconsistency scale (Keeley et al., 2016). Additionally, one individual was removed for scoring above 2 on the PID-5 overreporting scale (Sellbom et al., 2018). From Sample 3, 13 individuals were removed due to their scores on the response inconsistency scale and three were removed due to their scores on the overreporting scale. Thus, the final size of each sample was  $n_2 = 1,054$  and  $n_3 = 1,007$ . Samples 2 and 3 ranged from 53 to 76 years old with a mean age of 63.93. The majority of the sample was female (66.13%) and European American (99.80%), with the rest of the sample composed of 0.00% Asian American, 0.15% African American, 0.05% Native American, and 0.00% Other.

### Sample 4

Data for this sample were drawn from an inpatient psychotherapy clinic in Germany. Of the participants, 555 completed the surveys. Because a 100-item version of the PID-5 was collected in this sample, participants were not ruled out based on ORS or VRIN scores. Further, individuals below the age of 18 were not excluded as the data were collected from a psychotherapy clinic in which formal consent for minors was obtained. Exclusion criteria for Sample 4 thus solely comprised missingness criteria. If participants had greater than 10% of data missing, they were excluded. No participants in this sample met this criterion, and thus the final sample size was 555. Individuals in this sample ranged from 17 to 73 years old, with a mean age of 34.73. Majority of the sample was female (62.3%) and presumed European (>99%). Race/ethnicity is not a standard demographic variable collected in Germany, which is why it is not provided in Table S1 in the online supplementary materials.

## Measures

### Personality Inventory for the DSM-5

The PID-5 (Krueger et al., 2012) consists of 220 self-report items measuring the trait domains of the Alternative Model for Personality Disorders in the DSM-5. The PID-5 consists of 25 traits that form five overarching domains. See Table 1 for a description of which facets were included in the domains. The domains measured are antagonism, negative affectivity, disinhibition, detachment, and psychoticism. Each trait is assessed with anywhere from four to 14

items. Items are rated from 1 (*very false or often false*) to 4 (*very true or often true*). Cronbach's alpha ( $\alpha$ ) ranged from 0.85 to 0.95 in the current samples for all domains. See Table S2 in the online supplementary materials for Cronbach's alpha for all facets and domains. Further, omega total ( $\omega_t$ ) ranged from 0.85 to 0.95 providing evidence for adequate internal consistency of domains. The PID-5 is freely available and can be found at <https://www.psychiatry.org/psychiatrists/practice/dsm/educational-resources/assessment-measures>. Participants in Samples 1 through 3 completed the PID-5.

### Personality Inventory for the DSM-5-Faceted Brief Form

The German version (Zimmermann et al., 2014) of the Personality Inventory for the DSM-5-Faceted Brief Form (PID-5-FBF) (Maples et al., 2015) is a 100-item version of the PID-5. This measure captures the 25 facets of the PID-5 and yields the five overarching domain scores. The overarching domain measures are antagonism, disinhibition, negative affectivity, detachment, and psychoticism. Items are scored from 0 (*very false or often false*) to 3 (*very true or often true*). Cronbach's alpha ( $\alpha$ ) for domains ranged from 0.85 to 0.91, and  $\omega_t$  ranged from 0.89 to 0.91 for domains. Only participants in Sample 4 completed the PID-5-FBF.

### International Personality Items Pool—NEO PI-R

The International Personality Items Pool—NEO PI-R (IPIP-NEO) (Goldberg et al., 2006) is a measure of the FFM consisting of 300 self-report items. Five overarching domains are measured: openness, extraversion, conscientiousness, agreeableness, and neuroticism. Each domain consists of six facets, which in turn consist of 10 items each. For consistency among measures, items were not scaled according to the traditional IPIP-NEO scaling. Instead, items were scaled from 1 (*very false or often false*) to 4 (*very true or often true*). Cronbach's alpha ( $\alpha$ ) for trait domains ranged from 0.90 to 0.94, and  $\omega_t$  ranged from 0.90 to 0.95 in the current samples. Additionally, all items were keyed to match the direction of the PID-5 for ease of interpretation across all domains studied. Only participants in Samples 1 through 3 completed this measure.

### World Health Organization's Quality of Life Short Form

World Health Organization's Quality of Life Short Form (WHOQOL-BREF) (Skevington et al., 2004) is a 26-item self-report

**Table 1**

List of Facets for All IPIP-NEO and PID-5 Domains

Domain	Facets
IPIP—neuroticism (lack of emotional stability)	Anxiety, anger, depression, self-consciousness, vulnerability, immoderation
PID—negative affectivity	Anxiousness, emotional lability, hostility, perseveration, separation insecurity, submissiveness
IPIP—extraversion	Friendliness, gregariousness, assertiveness, activity level, excitement seeking, cheerfulness
PID—detachment	Anhedonia, intimacy avoidance, depressivity, suspiciousness, withdrawal
IPIP—agreeableness	Morality, altruism, cooperation, modesty, sympathy, trust
PID—antagonism	Attention seeking, callousness, deceitfulness, grandiosity, manipulativenss
IPIP—conscientiousness	Self-efficacy, orderliness, dutifulness, achievement striving, self-discipline, cautiousness
PID—disinhibition	Distractibility, impulsivity, irresponsibility, risk-taking
PID—psychoticism	Eccentricity, perceptual dysregulation, unusual beliefs, and experiences
IPIP—openness	Imagination, artistic interests, emotionality, adventurousness, intellect, liberalism

Note. Facets constituting domains for the IPIP-NEO and the PID-5 in all samples. IPIP-NEO = International Personality Items Pool-NEO; PID-5 = Personality Inventory for DSM-5.

measure of QoL and was completed in Samples 1 through 3. This measure is comprised of four domains of QoL: psychological, physical, social, and environment. An overall score of QoL was also derived. All domains of QoL, including the overall scale, were utilized in this study. Items are on a scale from 1 to 5 with varying anchors. Three items were reversed to match the direction of the rest of the scales, in which higher values indicate higher QoL. Cronbach's alpha ( $\alpha$ ) ranged from 0.61 to 0.93 across all samples for trait domains. Additionally,  $\omega_t$  ranged from 0.61 to 0.93. Lower Cronbach's alpha (e.g.,  $\alpha = 0.61$ ) occurred for the overall domain. However, this domain is composed of only two items which negatively impacts Cronbach's alpha. Moreover, moderate internal consistency is not only expected but desired when a small number of items are used to capture a broad content space (Boyle, 1991) as high internal consistency in such instances might be "antithetical to high validity" (Kline, 2015, p. 118). Therefore, this domain was retained in the present study. Additionally, a composite scale was added that represents the average of all 26 items on the measure for each individual. Cronbach's alpha for this scale ranged from  $\alpha = 0.91$  to  $\alpha = 0.93$  across Samples 1 through 3.

### World Health Organization Disability Assessment Schedule 2.0

The German version of the World Health Organization Disability Assessment Schedule 2.0 (WHODAS-2) is a 12-item self-report measure of health and disability (Üstün et al., 2010), thus representing an index of impairment. Participants in Sample 4 (i.e., the clinical sample) completed this measure. This measure analyzes six domains of health and disability: cognition, mobility, self-care, household activities, social, and society. All domains were used in this study. Items were on a scale of 0 to 4 in which higher scores indicate more disability/impairment and each domain is composed of two items. Cronbach's alpha and omega total coefficients for these domains ranged from 0.48 to 0.85. Again, lower reliability coefficients are a function of the small number of items per scale.

### Statistical Analysis

Each sample was analyzed separately. All facets were scored by averaging all items from each facet. Domains were formed by averaging across facets in the domain. This was done for each overarching IPIP-NEO and PID-5 domain (see Table 1 for a list of facets that formed each domain). In addition, all items on personality were keyed in the maladaptive direction. Thus, those domains that were already in the maladaptive direction (i.e., all of the PID-5 domains and neuroticism from the IPIP-NEO) were not recoded, but those that were in the positive direction (i.e., extraversion, agreeableness, openness, and conscientiousness) were recoded to be in the maladaptive direction. This was done for ease of interpretation across domains in that higher levels of all individual traits would indicate the traditionally (low) maladaptive pole of the domain. QoL domains reflect higher levels of QoL, whereas impairment domains are coded such that higher values represent higher levels of impairment.

Two-line testing was used to analyze nonmonotonicity; our approach follows the methods outlined by Simonsohn (2018). Essentially, this test fits each domain into two regression lines: one for low values of the personality domain and one for high values of the personality domain. The break point, or location where one

line ends and the second one starts, was set as the mean of the personality domain variable.<sup>2</sup> Thus, this analysis represents a form of segmented regression. Evidence of nonmonotonicity exists if there is a change in sign between the lines and both slope values themselves are significant predictors. This method is more conservative compared to traditional testing of nonmonotonic relationships, such as using quadratic regression. Additionally, it tests for nonmonotonicity without relying on assumptions of the true functional form of the variables being tested, which is not known. Thus, it may be argued that the two-lines test is able to more accurately test for nonmonotonicity compared to other approaches. Due to the number of associations being tested a significance threshold of  $p < .01$  was used for slope coefficients to decrease the likelihood of type-I errors.

### Transparency and Openness

We report all data exclusion criteria and how the final sample size was determined. All measures used in this study are reported. Data, analysis code, and research materials are available upon request to the corresponding author. Data were analyzed using R version 4.1.3. This study was not preregistered.

### Results

Table 2 conveys the results of the two-line regressions for the quality-of-life composite scale. Tables S3–S7 in the supplemental materials display results of the two-line regression for the component quality-of-life domains (i.e., overall, physical, psychological, social, and environmental). Table 3 demonstrates the results of the two-line regression in all WHODAS-2.0 domains for Sample 4. Notably, across samples and across measures of quality of life and impairment, there is little evidence for nonmonotonicity. In fact, we found only one nonmonotonic association, which did not replicate across samples.

### Monotonic Associations

Across domains of QoL and impairment in the four samples, there was a total of 210 individual analyses of 10 personality domains (IPIP-NEO and PID-5). Domains were considered to have significant monotonic associations if both lines were in the same direction and significant at  $p < .01$ . Of these analyses, 163 had significant monotonic effects (77.63%). Neuroticism (low emotional stability), (low) extraversion, and (low) conscientiousness were negatively associated with QoL across all 18 analyses for each domain. Negative affectivity and detachment consistently evinced monotonic effects, they respectively demonstrated 21 (87.50%) and 23

<sup>2</sup>We also conducted analyses using the Robin Hood algorithm as described in Simonsohn (2018), using code from that paper. Results were substantively the same, in that across all tests in all samples, there were no replicable significant deviations from monotonicity ( $p$ -values  $> .01$ ). Fourteen associations did emerge as nonmonotonic, but again none of the associations replicated across samples. Notably, the nonmonotonic associations that did emerge did not replicate cross-method either, that is, none of the nonmonotonic associations found were the same as the one nonmonotonic association found using the mean breakpoint approach. We presented the mean breakpoint analysis results to be more conservative, and because the substantive conclusions were identical in there being no replicable evidence for nonmonotonicity.

**Table 2***Two-Lines Regression Coefficients and p-Values for All PID-5 and IPIP-NEO Domains in Samples 1–3 for Quality-of-Life Composite Scale*

Predictor	Sample 1		Sample 2		Sample 3	
	Line 1( $\beta$ )	Line 2( $\beta$ )	Line 1( $\beta$ )	Line 2( $\beta$ )	Line 1( $\beta$ )	Line 2( $\beta$ )
PID—negative affectivity	−0.221***	−0.343***	−0.219***	−0.240***	−0.144***	−0.288***
<i>p</i>	.000	.000	.000	.000	.000	.000
Nonmonotonic?		No		No		No
IPIP—neuroticism	−0.330***	−0.434***	−0.282***	−0.372***	−0.315***	−0.355***
<i>p</i>	.000	.000	.000	.000	.000	.000
Nonmonotonic?		No		No		No
PID—detachment	−0.369***	−0.414***	−0.334***	−0.394***	−0.357***	−0.395***
<i>p</i>	.000	.000	.000	.000	.000	.000
Nonmonotonic?		No		No		No
IPIP—(low)-extraversion	−0.167***	−0.348***	−0.203***	−0.277***	−0.186***	−0.331***
<i>p</i>	.000	.000	.000	.000	.000	.000
Nonmonotonic?		No		No		No
PID—antagonism	−0.071***	−0.009	−0.073***	−0.106**	−0.091***	−0.045
<i>p</i>	.000	.329	.000	.002	.000	.070
Nonmonotonic?		No		No		No
IPIP—(low)-agreeableness	−0.131***	−0.106***	−0.093***	−0.190***	−0.200***	−0.178***
<i>p</i>	.000	.000	.000	.000	.000	.000
Nonmonotonic?		No		No		No
PID—disinhibition	−0.195***	−0.084***	−0.081***	−0.144***	−0.109***	−0.204***
<i>p</i>	.000	.000	.000	.000	.000	.000
Nonmonotonic?		No		No		No
IPIP—(low)-conscientiousness	−0.213***	−0.249***	−0.225***	−0.274***	−0.181***	−0.282***
<i>p</i>	.000	.000	.000	.000	.000	.000
Nonmonotonic?		No		No		No
PID—psychoticism	−0.287***	−0.207***	−0.226***	−0.166***	−0.225***	−0.189**
<i>p</i>	.000	.000	.000	.000	.000	.000
Nonmonotonic?		No		No		No
IPIP—(low)-openness	−0.074**	−0.021	−0.157***	−0.123***	−0.111***	−0.113***
<i>p</i>	.001	.472	.000	.000	.000	.000
Nonmonotonic?		No		No		No

*Note.* Results of the two-lines test are presented. Values are standardized  $\beta$  values. To be considered nonmonotonic a change in sign and significance in both  $\beta$  values at the  $p < .01$  level was needed. IPIP-NEO = International Personality Items Pool-NEO; PID-5 = Personality Inventory for DSM-5.

\*\*\* $p < .001$ . \*\* $p < .01$ . \* $p < .05$ .

(95.83%) significant monotonic effects out of 24 possible effects. All associations between negative affectivity and detachment with QoL were negative, whereas their associations with impairment were positive. (Low) Agreeableness produced 17 out of 18 possible effects (94.44%) while antagonism only produced three significantly monotonic effects out of 24 possible (12.5%). Significant monotonic effects that emerged for (low) agreeableness and antagonism were negative associations with QoL domains. Disinhibition was negatively associated with QoL domains for 18 out of 24 (75%) possible effects. Additionally, psychoticism evinced 16 significantly monotonic effects out of 24 possible (75.00%) of which associations were negative with QoL domains but positive with impairment domains. (Low) openness was negatively associated with QoL for 11 out of 18 (61.11%) possible effects. Overall, of the significant monotonic associations that did emerge, most produced negative slopes with QoL and positive slopes with impairment suggesting that across personality domains there is a clear pole that is related to worse QoL and increased impairment across domains.

Within the monotonic associations that emerged, there were some asymmetric associations in which one line of the two-lines test was notably steeper than the other. This indicates that part of the trait domain may have a stronger relationship with QoL and that even among monotonic associations, there is some variation in slope. 2.86% (6 out of 210) of associations had a difference in slope ( $\beta$ )

that was greater than 0.170. This occurred most often in the (low) extraversion domain, but did also occur for negative affectivity, disinhibition, and (low) conscientiousness and occurred across domains of QoL. For associations that exhibited this difference between lines, the steeper line was the second line which covers the more maladaptive end of the personality domain suggesting that the more highly maladaptive a trait is the stronger it is (negatively) related to QoL.

Another pattern of associations that emerged with the two-lines test was one in which one line was significant at the  $p < .01$  level but the other was not, suggesting that the domain is only related to QoL within one-half of the continuum. A nonsignificant association was most often seen in the second line and occurred in about 12.8% (27 out of 210 associations) across domains of QoL. The first line was only found to be nonsignificant 0.48% of the time (one out of 210 associations). Notably, a nonsignificant second line occurred most often in the antagonism domain (11 out of 24 associations) in which many lines were found to be nonsignificant in associations with both QoL and impairment. Additionally, this occurred frequently in the psychoticism domain (seven out of 24 associations). Disinhibition and (low) openness also exhibited this form of relationship in the second line. (Low) Agreeableness evinced one instance of only one of the two lines reaching significance, however the first line was not significant. These results suggest that for some

**Table 3**  
*Two-Lines Regression Coefficients for All PID-5 Domains and WHODAS 2.0 in Sample 4*

Predictor	Cognition		Mobility		Self-Care		Household activities		Social		Society	
	Line 1(β)	Line 2(β)	Line 1(β)	Line 2(β)	Line 1(β)	Line 2(β)	Line 1(β)	Line 2(β)	Line 1(β)	Line 2(β)	Line 1(β)	Line 2(β)
PID—negative affectivity	0.115*** .000	0.111*** .000	0.059*** .000	0.060* .015	0.103*** .000	0.016 .270	0.188*** .000	0.161** .004	0.265*** .000	0.168** .001	0.175*** .000	0.035 .135
Nonmonotonic?	No	No	No	No	No	No	No	No	No	No	No	No
PID—detachment	0.304*** .000	0.255*** .000	0.153*** .000	0.176** .003	0.149*** .000	0.196** .002	0.248*** .000	0.121* .044	0.315*** .000	0.312*** .000	0.335*** .000	0.221*** .000
Nonmonotonic?	No	No	No	No	No	No	No	No	No	No	No	No
PID—antagonism	-0.070 .389	0.104 .052	-0.135 .102	0.059 .115	-0.056 .837	0.075 .103	-0.069 .616	0.080 .086	-0.099 .123	0.156** .006	-0.017 .378	-0.006 .762
Nonmonotonic?	No	No	No	No	No	No	No	No	No	No	No	No
PID—disinhibition	0.318*** .000	0.132* .027	0.086** .004	0.076 .108	0.085*** .000	0.132** .002	0.185*** .000	0.102* .029	0.112*** .000	0.162*** .000	0.190*** .000	0.077 .252
Nonmonotonic?	No	No	No	No	No	No	No	No	No	No	No	No
PID—psychoticism	0.135*** .000	0.010 .080	0.151** .004	0.030 .981	0.113*** .000	0.131* .023	0.189*** .000	0.052 .815	0.197*** .000	0.113* .017	0.160*** .000	0.049 .459
Nonmonotonic?	No	No	No	No	No	No	No	No	No	No	No	No

*Note.* Results of the two-lines test are presented. Values are standardized β values. The impairment domains are those of the WHODAS-2.0. To be considered nonmonotonic, a change in sign and significance in both β values at the  $p < .01$  level was needed. PID-5 = Personality Inventory for DSM-5; WHODAS 2.0 = World Health Organization Disability Assessment Schedule 2.0. \*\*\* $p < .001$ . \*\* $p < .01$ . \* $p < .05$ .

personality domains, only half of the continuum is related to QoL and impairment.

**Nonmonotonic Associations**

One association emerged as nonmonotonic (0.48%). This association was found for disinhibition and overall QoL in Sample 2 in which the first line was a positive association, and the second line was a negative association indicating that higher disinhibition is related to lower QoL. Notably, for PID-5 antagonism in Sample 4, there was some evidence of sign changes between Lines 1 and 2, but these changes were not statistically significant at  $p < .01$  and, thus, did not fully satisfy the criteria for a nonmonotonic association in the present study. Given that these findings did not replicate across samples or across domains of QoL, overall, there is little evidence supporting nonmonotonic associations between personality domains, QoL, and impairment in the present study.

**Discussion**

The present study sought to elucidate the nature of associations connecting personality domains with several areas of QoL in Samples 1–3 (i.e., composite, overall, physical, psychological, social, and environmental) and impairment in Sample 4 (i.e., cognition, mobility, household activities, social, and society). Specifically, we sought to determine if personality domains as measured by PID-5 and IPIP-NEO have nonmonotonic associations with QoL and impairment. Several authors have posited that trait domains are functionally bipolar, in that both ends of a domain (i.e., extremely high and low scores) are perhaps related to worse outcomes. While there has been extensive work on how the traditionally maladaptive pole relates to various forms of well-being, how this end specifically relates to QoL and impairment has been less well researched. Additionally, few studies have empirically studied how the adaptive pole, in the extreme, relates to QoL and impairment. It has been theorized, however, that having too much of a traditionally adaptive trait could be pathological (Widiger & Crego, 2019). This has been termed “too much of a good thing” (Grant & Schwartz, 2011). The present study explored nonmonotonicity in both poles of major personality trait domains.

Overall, there was not strong evidence for the specific form of nonmonotonic associations studied among the personality domains and QoL domains, indicating the hypotheses of this study were not supported. Additionally, the PID-5 domains, or traditionally maladaptive personality traits, evinced relationships that were largely related to poorer QoL and increased impairment. The IPIP-NEO domains, keyed in the maladaptive direction, also exhibited associations related to poorer QoL. This study failed to offer support for the idea of maladaptive bipolarity, implying that both poles are related to deleterious outcomes (e.g., worse QoL or increased impairment). This is consistent with previous literature supporting that the PID-5 captures the low maladaptive end of the personality continua. This provides further evidence for the PID-5 trait domains being meaningful predictors of various domains of quality of life as demonstrated across multiple general population samples, as well as the PID-5 trait domains being meaningful predictors of impairment as demonstrated in a clinical sample.

Only one nonmonotonic association emerged, and it did not replicate across all three samples with the same measures.

Conscientiousness and emotional stability (opposite of neuroticism) have sometimes been found to demonstrate “too much of a good thing” in the Industrial/Organizational Psychology literature, although findings were generally mixed across studies. *Le et al. (2011)* found that conscientiousness and emotional stability, respectively, and both had a nonmonotonic relationship with job performance. Conscientiousness has further been found to have a nonmonotonic relationship with job satisfaction (*Carter et al., 2016*). *Le et al. (2011)* theorized that conscientiousness may relate to rigidity which could result in impairment. However, nonmonotonicity was not supported in studies related to job performance, health, well-being, job satisfaction, and academic success (*Bipp et al., 2020; Nickel et al., 2019; Walmsley et al., 2018*). Regarding the present study, the results did not support the “too much of a good thing” hypothesis for QoL or impairment. These findings add to the literature in that both impairment and QoL did not provide evidence for nonmonotonicity. While one nonmonotonic association did emerge as significantly related to the domains found in previous work (i.e., disinhibition which is the opposite pole of conscientiousness), it did not replicate across all samples nor did it emerge in many domains of QoL and impairment, thus, not providing strong evidence that this association is robust. This illustrates why replication efforts are needed in exploring these complex relationships.

While most domains did not demonstrate the specific form of nonmonotonic association studied, many did evince some form of monotonic association indicating that personality does meaningfully predict QoL and impairment. However, PID—antagonism evinced few significant slope values, suggesting it was typically best fit to a horizontal line or only half of the domain was associated with QoL. However, (low) IPIP—agreeableness did evince many significantly monotonic associations suggesting that low agreeableness may behave differently than antagonism. These findings indicate that PID—antagonism does not meaningfully relate to most areas of QoL, which is consistent with the literature on antagonism and functioning. A previous study found that most facets of antagonism (i.e., grandiosity, attention seeking, manipulativeness, and callousness) were not associated with the WHOQOL-BREF domains (*Boland et al., 2018*). Deceitfulness was the only facet that evinced moderate associations with the QoL domains (*Boland et al., 2018*). Further, past work that has looked at antagonism and QoL in adolescents found that antagonism had no association with most domains of QoL (*De Caluwé et al., 2019*).

The results of the present study broadly support previous work done by *Williams and Simms (2018)*. The authors found that none of the associations evinced relationships that were truly nonmonotonic in nature. However, their results did indicate possible “asymmetric” nonmonotonicity of agreeableness and conscientiousness with various dysfunction indicators (*Williams & Simms, 2018*). That is, the traditionally adaptive end of these domains was less strongly related to dysfunction compared to the traditionally maladaptive end. While we did find evidence of asymmetric relationships, these varied in form and were not consistent across samples. Therefore, we could only reliably demonstrate that the traditionally maladaptive end was related to worse QoL and increased impairment.

Replication was a key component and strength of the current study. Only one nonmonotonic association emerged and it did not replicate across samples. However, monotonic associations showed

a high degree of replication across trait domains for neuroticism, (low) extraversion, (low) conscientiousness, negative affectivity, detachment, and (low) agreeableness. Overall, this study supports that pathological personality traits are related to worse QoL and increased impairment, but that the opposing pole is likely not related to worse QoL or impairment.

While this study has many strengths (e.g., replication across samples), it is not without its limitations. First, only one clinical sample was included, and this sample did not complete a measure of Big 5 personality traits (e.g., IPIP-NEO). Clinical samples are important because these persons likely experience a greater degree of psychopathology meaning more people are likely to be in the extreme ends of the domains. Given the assumption of personality traits following a normal curve, future studies should oversample in the tails of the distribution to better depict the relationships in the extreme. This could be helped through the use of a clinical sample of individuals with personality disorders. While the present study did include a clinical sample, this sample was of a broad range of psychopathology rather than specific individuals high in personality pathology. Somewhat related to this, the provided samples lacked racial and ethnic diversity. Thus, our conclusions likely cannot be extended to the general population more broadly. Future studies should make use of more diverse samples.

An additional limitation was that the measures used are all evaluatively unbalanced (see also *John & Robins, 1993*). That is, high levels of the trait (e.g., extraversion) are described with positively worded items and low levels of the trait (e.g., detachment) are described with negatively worded items. In other words, our measures did not include items that describe a high level of the trait maladaptively (e.g., maladaptive extraversion) and a low level of the trait adaptively (e.g., adaptive detachment). As such, we do not know what the relationships would be with a fully balanced measure (*Borkenau & Ostendorf, 1989*). Additionally, the two-lines test was only able to assess for nonmonotonic relationships, not other forms of curvilinearity. Future studies should assess if other forms of curvilinearity, like a sigmoid curve, may be occurring in the association between personality and QoL. The final limitation to note is that all data is drawn from self-report, which could inflate associations. Future studies should make use of varied reporting methods such as an interview or using informant reports.

The current study was the first to analyze nonmonotonic relationships for PID-5 and IPIP-NEO domains with QoL and impairment. Further, results were tested across four samples allowing for a look at the replicability of the relationships. Additionally, a clinical sample was incorporated to assess if these relationships were similar in a sample that likely experiences more personality pathology. Results indicate that overall, there was no consistent evidence for the “too much of a good thing” hypothesis as it relates to QoL or impairment.

## Conclusions

This study was the first to explicitly analyze the potential nonmonotonicity of the relationship between personality trait domains and QoL, as well as impairment. Further, the replicability of results was tested across samples. PID-5 personality domains and IPIP-NEO personality domains did not demonstrate nonmonotonic relationships. These findings suggest that overall, traditionally maladaptive

domains of personality (i.e., PID-5) are related to worse QoL and higher levels of impairment. This has implications for better understanding QoL in individuals with personality pathology.

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