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Maladaptive Personality Traits and Romantic Relationship Satisfaction: A Monozygotic Co-Twin Control Analysis

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Abstract

The recent inclusion of an alternative model for personality disorders in the *Diagnostic and Statistical Manual of Mental Disorders–Fifth Edition (DSM-5)* (American Psychiatric Association, 2013) highlights the importance of extreme variants of personality for psychopathology. The maladaptive personality traits described in the alternative model comprise 5 higher-order domains and 25 lower-order facets that capture pathological levels of personality. The present report adds to a growing body of research on the implications of maladaptive personality traits for functioning by demonstrating significant associations between each of the higher-order domains (Negative Affect, Detachment, Antagonism, Disinhibition, Psychoticism) and most of the lower-order facets and lower romantic relationship satisfaction in a population-based sample of 284 monozygotic (MZ) adult twins. We further capitalized upon co-twin differences in levels of personality pathology in a causally informative approach, the MZ co-twin control study design. Co-twin control analyses indicated that higher levels of Negative Affect, Detachment, Disinhibition, Psychoticism, as well as several lower-order facets, were associated with lower romantic relationship satisfaction even after accounting for the genetic and environmental factors shared by twins that confer liability toward personality pathology and psychosocial dysfunction. The present results lend support to the potentially causal implications of personality pathology for interpersonal functioning, even in a community sample unlikely to be evidencing clinical levels of pathology, by suggesting that extreme variants of personality, manifested by comparably extreme deviations in thinking, feeling, behaving, and interacting with others, may lead to impaired functioning in important domains.

Keywords

Personality pathology; Personality Inventory for the *DSM-5* (PID-5); romantic relationship; co-twin control study design

The importance of extreme variants of personality for psychopathology was highlighted by the inclusion in the most recent edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)* (American Psychiatric Association, 2013a) of an alternative model for personality disorders. Personality disorder diagnoses have historically been made using diagnostic criterion sets and thresholds. The alternative model instead classifies personality disorders by significant impairment in personality (self and interpersonal) functioning and specific patterns of pathological personality traits, delineated using five broad domains of

personality–Negative Affectivity (versus emotional stability), Detachment (versus extraversion), Antagonism (versus agreeableness), Disinhibition (versus compulsivity), Psychoticism (versus lucidity)—and 25 lower-order facets. Problems in personality functioning include impairments in “self” functioning, such as issues with identify, self-concept, and self-direction, and “interpersonal” functioning, such as issues with interpersonal relatedness, intimacy, empathy, and communal behavior. In the present report, we add to a growing body of research on the implications of personality pathology traits, conceptualized using this alternative model, for functioning in important domains. Specifically, we examined associations between maladaptive personality traits and romantic functioning in a population-based sample of adult twins. We further extended the existing research by capitalizing upon co-twin differences in levels of personality pathology using a causally informative approach, the monozygotic (MZ) co-twin control study design, which afforded a means of disentangling potentially causal effects of personality pathology on romantic functioning from the confounding influences of genetic and environmental liability toward dysfunction shared by twins.

The similarity between the alternative model of personality disorders and Big Five models of normal-range personality is readily apparent. For example, the Five Factor Model, among the most widely accepted and empirically supported models of normal-range personality (Digman, 1990; McCrae & Costa, 1987; McCrae & John, 1992), comprises 5 higher-order domains that are directly comparable to, albeit capturing less extreme levels of, the 5 higher-order domains in the alternative model: Neuroticism, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience. Notably, there is evidence of phenotypic and genetic overlap in the higher-order and lower-order traits in the alternative model of personality disorders and normal-range personality models (Gore & Widiger, 2013; Kendler et al., 2016; Suzuki, Samuel, Pahlen, & Krueger, 2015; Z. E. Wright, Pahlen, & Krueger, 2017), suggesting that the maladaptive personality traits captured by the alternative model reflect extreme variants of normal-range personality traits.

Decades of research demonstrate that normal-range personality traits are associated with varied domains of functioning, including well being and life satisfaction, psychopathology, physical health, criminality, academic and occupational performance, and the quality of interpersonal relationships (see Ozer & Benet-Martinez, 2006; Paunonen, 2003; Roberts et al., 2007). If the maladaptive personality traits assessed by the PID-5 do, in fact, measure different levels of the same continuous constructs captured by normal-range personality models, we would expect these more extreme variants of personality to be manifested in comparably extreme deviations in thinking, feeling, behaving, and interacting with others, with negative implications for the quality of functioning in important domains. Although still in its relative infancy, the emerging evidence on the alternative model for personality disorders seems to bear this expectation out. The maladaptive personality traits described in the alternative model for personality disorders are operationalized in the Personality Inventory for the *DSM-5* (PID-5; Krueger et al., 2012), a self-report measure of pathological levels of personality. Although the PID-5 was only recently developed, it has been the focus of a growing body of research examining associations with functioning in important domains. Three studies have found that PID-5 traits were generally associated with impaired psychosocial functioning, including lower life satisfaction, less participation in society,

increased mobility/self-care limitations, and greater impulse-control problems, work problems, and relationship problems (Chmielewski, Ruggero, Kotov, Liu, & Krueger, 2017; Simms & Calabrese, 2016; A. G. C. Wright et al., 2015). Five studies have found that PID-5 traits were generally associated with greater interpersonal problems (Fossati, Borroni, Somma, Markon, & Krueger, 2017; Simms & Calabrese, 2016; Williams & Simms, 2016; Williams, Thomas, Donnellan, & Hopwood, 2014; A. G. C. Wright et al., 2012), as well as romantic relationship satisfaction (Decuyper, Gistelinck, Vergauwe, Pancorbo, & DeFruyt, in press) and intimate partner violence (Dowgwillo, Menard, Krueger, & Pincus, 2016). These findings for the PID-5 dovetail with those for other measures of personality pathology, such as the Schedule for Nonadaptive and Adaptive Personality (SNAP; e.g., Stroud, Durbin, Saigal, & Knobloch-Fedders, 2010) and the Dimensional Assessment of Personality Pathology (DAPP; e.g., Decuyper et al., in press), as well as personality disorder diagnoses and symptoms (Wilson, Stroud, & Durbin, 2017).

In the present report, we add to this growing literature by examining associations between maladaptive personality traits, measured using the PID-5, and romantic relationship satisfaction, assessed in a population-based sample of adult twins. We further extend the existing research in a novel way, by capitalizing upon co-twin differences in levels of personality pathology in a causally informative approach. An important limitation to much of the existing literature is that the vast majority of studies has been cross-sectional, meaning that the causal nature of the association between personality pathology and functioning remains unclear (for a notable exception, see A. G. C. Wright et al., 2015). It is reasonable to expect that higher levels of personality pathology are causally related to lower romantic relationship satisfaction through more dysfunctional patterns of thinking, feeling, behaving, and interacting that increase the likelihood of maladaptive behaviors with one's romantic partner: "Fundamentally, personality pathology irritates and complicates day-to-day interpersonal situations and, over time, relationships" (Hopwood, A. G. C. Wright, Ansell, & Pincus, 2013, p. 273). However, the existing cross-sectional research cannot rule out the possibility that impaired romantic functioning instead leads to personality pathology. It is also plausible that associations between personality pathology and romantic functioning are actually accounted for by an underlying liability toward dysfunction. Of particular note is evidence of the heritability of maladaptive personality traits (Z. E. Wright et al., 2017), as well as the finding that romantic relationship satisfaction moderates genetic and environmental influences on normal-range personality traits (South, Krueger, Elkins, Iacono, & McGue, 2016).

The MZ co-twin control study design offers greater causal inference than the typical cross-sectional study design by taking advantage of a "naturally" occurring control within a correlational framework (McGue, Osler, & Christensen, 2010; Rutter, 2007). Although biometric models that partition phenotypic variance into genetic and environmental components are often applied in twin studies, the co-twin control study design instead focuses on twin differences in a construct of interest to explore the basis of individual differences in behavior. Because MZ co-twins share both genes and environmental experiences, any differences between them necessarily reflect nongenetic, nonshared environmental experiences. As such, MZ co-twins provide built-in controls for the genetic and shared environmental factors that are confounded with personality pathology and

romantic relationship satisfaction. Differences in levels of personality pathology in co-twin pairs allows us to isolate potentially causal effects of personality pathology on romantic relationship satisfaction, accounting for liability toward dysfunction. If twins with higher levels of personality pathology show lower romantic relationship satisfaction relative to their co-twins with lower levels of personality pathology, this is consistent with a potentially causal effect of personality pathology on functioning. In contrast, if romantic relationship satisfaction is comparable among co-twins who differ in their levels of personality pathology, this is inconsistent with a potentially causal effect and instead suggests that the association is due to underlying liability toward dysfunction.

We examined romantic functioning because the romantic relationship is the primary interpersonal domain for a majority of adults and romantic commitment is considered a fundamental milestone in adult development. In a recent meta-analysis of associations between personality disorders, defined using the traditional personality disorder diagnoses, and interpersonal functioning, we found a lack of significant associations with functioning in the romantic relationship domain, with the one exception of borderline personality disorder, which showed a modest association (Wilson et al., 2017). However, we speculated that associations may be stronger using the alternative model for personality disorders, rather than personality disorder diagnoses, given the stronger psychometric properties of the PID-5 relative to categorical approaches to personality disorders (e.g., Simms & Calabrese, 2016). Recently, Decuyper et al. (in press) found that personality pathology, measured using the PID-5, was associated with self and partner reports of relationship satisfaction in dating and married couples. However, only the higher-order domains were included in that study. In the present report, we examined both the higher-order domains and lower-order facets, and expected maladaptive personality traits to be generally associated with lower romantic relationship satisfaction.

Although the MZ co-twin control study design offers greater causal inference than the typical cross-sectional study design, it is still only quasi-experimental—random assignment to personality pathology groups would be necessary for a true experimental design (though unethical to do, even if it were possible). As such, the co-twin control study design cannot definitely rule out other plausible explanations for associations between personality and romantic relationship functioning, including reverse causation (see McGue et al., 2010). Greater confidence in the co-twin control approach comes from longitudinal assessments that can lend temporal support for possibly causal relationships and help rule out the possibility of reverse causation. Because the PID-5 was developed only recently, we could not explicitly test whether twin differences in maladaptive personality traits, measured using the PID-5, predicted romantic relationship satisfaction in the present sample. However, we were able to take advantage of our longitudinal assessment of romantic functioning in this sample. Specifically, we conducted a set of secondary prospective analyses that examined whether twin differences in normal-range personality traits predicted later romantic relationship satisfaction, as well as whether twin differences in romantic relationship satisfaction predicted later maladaptive personality traits. Evidence that twin differences in normal-range personality traits predict romantic relationship satisfaction, in conjunction with concurrent twin differences for maladaptive personality traits, would bolster the interpretation that twin differences in personality have a potential causal effect on romantic

functioning. Evidence that twin differences in romantic relationship satisfaction fail to predict maladaptive personality traits would help to rule out reverse causation as a possible interpretation for the association between personality pathology and romantic functioning.

Methods

Participants and Procedures

Participants were 284 MZ twins (including 105 intact twin pairs, 51% female) from the Minnesota Twin Family Study (MTFS). The MTFS is an ongoing community-based, longitudinal study of reared-together twins and their parents, and is one of several ongoing studies that comprise the Minnesota Center for Twin and Family Research (MCTFR); the study design and sample have been described extensively elsewhere (see Iacono, Carlson, Taylor, Elkins, & McGue, 1999; Iacono & McGue, 2002; Iacono, McGue, & Krueger, 2006) and are only briefly reviewed here. The present report includes a subset of participants from a cohort of twins who first participated at age 11 ($M = 11.72$, $SD = 0.43$), with follow-up assessments targeting ages 14 ($M = 14.80$, $SD = 0.53$), 17 ($M = 17.83$, $SD = 0.69$), 20 ($M = 21.10$, $SD = 0.82$), 24 ($M = 25.01$, $SD = 0.90$), 29 years ($M = 29.42$, $SD = 0.65$), and 34 years ($M = 34.69$, $SD = 1.26$); data collection for the age-34 follow-up assessment is ongoing. Rates of retention across follow-up waves has been universally high (over 88% across assessments). Consistent with the demographic makeup of Minnesota during the targeted birth years, twins are predominately Caucasian (95%). The present report includes data on twins' maladaptive personality traits and romantic relationship satisfaction, collected at the most recent assessment at age 34; 277 participants provided data on normal-range personality and 230 participants also provided data on romantic relationship satisfaction at age 29 that were used in secondary analyses, as described below. This study was approved by the research ethics committee at the University of Minnesota (IRB protocol #8704M00020).

Measures

Maladaptive personality traits—Participants reported on their maladaptive personality traits at age 34 using the 220-item Personality Inventory for the *DSM-5* (PID-5; Krueger et al., 2012). The PID-5 comprises 5 higher-order domains (measured by 21 to 33 items) and 25 lower-order facets (measured by 4 to 14 items)¹. We computed scores on the lower-order facets by taking the average across items assigned to each facet, after reverse coding, as appropriate (see APA, 2013b). The higher-order domains are delineated by the lower-order facets. We computed scores for the higher-order domains by taking the average of the assigned lower-order facets (see APA, 2013b): Negative Affectivity (emotional lability, anxiousness, separation insecurity), Detachment (withdrawal, anhedonia, intimacy avoidance), Antagonism (manipulativeness, deceitfulness, grandiosity), Disinhibition (irresponsibility, impulsivity, distractibility), Psychoticism (unusual beliefs, eccentricity, perceptual dysregulation). We grouped the remaining lower-order facets to higher-order domains conceptually, following previous research (A. G. C. Wright et al., 2012; A. G. C.

¹The PID-5 also includes 2 validity items to ensure careful responding ("I was born on the moon," "Two plus two equals four"). $n = 20$ participants failed to respond correctly to one or both of these validity items and were removed from the sample.

Wright et al., 2015). Internal consistency, indexed by Cronbach's alpha, was in the adequate-to-excellent range for all domains and facets (median alpha = .86), with the one exception of the suspiciousness facet (alpha = .62) (see Table 1).

Normal-range personality traits—Participants reported on their normal-range personality traits at age 29 using a brief 133-item version of the Multidimensional Personality Questionnaire (MPQ; Tellegen & Waller, 2008). The brief version includes 6 lower-order facets (stress reaction, alienation, aggression, well being, control, harm avoidance). We computed scores on the lower-order facets by taking the average across items assigned to each facet, after reverse coding, as appropriate (see Tellegen & Waller, 2008). Internal consistency, indexed by Cronbach's alpha, was in the good-to-excellent range for all facets (median alpha = .90) (see Table 1).

Romantic relationship quality—Participants currently involved with (married, living with, or dating for at least 3 months) a romantic partner reported on their overall romantic relationship quality (affection, disagreements, satisfaction) at ages 29 and 34 using a brief 12-item version of the Dyadic Adjustment Scale (DAS; Spanier, 1976). We computed an overall romantic relationship satisfaction score by taking the average of the 12 items after reverse scoring, as appropriate. Internal consistency, indexed by Cronbach's alpha, was .84 at age 29 and .88 at age 34 (see Table 1).

Data Analyses

We first conducted preliminary analyses, including descriptive statistics and zero-order correlations, for maladaptive personality traits assessed using the PID-5 at age 34, normal-range personality traits assessed using the MPQ at age 29, and romantic relationship satisfaction assessed using the DAS at ages 29 and 34; we also conducted inter-twin correlations on maladaptive personality traits and romantic relationship satisfaction at age 34. We then conducted a series of individual-level linear mixed models to examine associations between maladaptive personality traits and romantic relationship satisfaction at age 34, followed by co-twin control analyses for significant individual-level associations that isolated twin difference (consistent with potentially causal) effects of personality pathology on romantic functioning. Finally, we conducted two sets of secondary analyses. We conducted a series of individual-level and co-twin control analyses to examine first whether normal-range personality traits at age 29 predicted romantic relationship satisfaction at age 34, and second whether romantic relationship satisfaction at age 29 predicted maladaptive personality traits at age 34.

Individual-level analyses—Individual-level linear mixed models were conducted in R version 3.3.1 (R Core Team, 2015) using lmer from the lme4 package (Bates et al., 2015) with denominator degrees of freedom adjusted using the Kenward-Roger approximation from the lmerTest package (Kuznetsova, Brockhoff, & Christensen, 2014). Random intercepts were included at the twin pair level to account for the interdependence of the twin data (i.e., resemblance between twins in a twin pair). All models included participant age and sex as covariates; potential interactions with participant sex were examined by including a trait $\times$ sex interaction term in models.

Co-twin control analyses—Co-twin control analyses were also conducted using lmer from the lmer4 package in R, specifying random intercepts at the twin pair level to account for the interdependent twin data. Co-twin control analyses decompose each individual twin's level on maladaptive personality traits into that which makes co-twins within a twin pair different (i.e., twin difference effects) and that which makes co-twins within a twin pair alike (i.e., genetic and shared environmental effects) (see Begg & Parides, 2003; McGue et al., 2010). Doing so allows us to isolate twin difference effects—an individual twin's deviation from the twin-pair mean. This approach is akin to group-mean centering, in which the difference between an individual (i.e., twin) score and the group (i.e., twin pair)-level mean is computed in order to remove group-level effects (see Kreft, Leeuw, & Aiken, 1995). In the co-twin control approach used here, these twin difference effects reflect nonshared environmental effects of maladaptive personality traits unconfounded by shared genetic or environmental influences; significant twin difference effects are consistent with potentially causal effects of pathological personality traits on romantic relationship satisfaction.

Results

Preliminary Analyses

Descriptive statistics for the PID-5 higher-order domains and lower-order facets at age 34, MPQ lower-order facets at age 29, and DAS romantic relationship satisfaction at ages 29 and 34 are presented in Table 1. As would be expected, given that this is a population-based sample, PID-5 domains and facets were generally positively skewed, though none showed extreme skewness or kurtosis. Higher levels on PID-5 domains and facets were generally associated with lower relationship satisfaction, as indicated by modest-to-moderate negative zero-order correlations. MPQ facets were also generally associated with relationship functioning, with higher levels of stress reaction, alienation, and aggression, and lower levels of well being and control associated with lower relationship satisfaction. Intra-pair correlations, indexing within-pair similarity, on the PID-5, MPQ, and DAS were significant for all but one variable; the median correlations of .32 for PID-5 variables and .75 for MPQ variables indicates that members of a twin pair showed a moderate-to-strong degree of similarity across maladaptive and normal-range personality traits.

Individual-Level Associations Between Maladaptive Personality Traits and Romantic Relationship Satisfaction

Individual-level analyses examined associations between maladaptive personality traits and romantic relationship satisfaction among the full sample of twins (i.e., these analyses consider twins as individuals and are comparable to analyses that would be conducted in a sample of singletons). Results of these individual-level analyses indicated that each of the five higher-order domains was significantly and negatively associated with romantic relationship satisfaction (see Table 2). That is, higher levels of Negative Affectivity, Detachment, Antagonism, Disinhibition, and Psychoticism were associated with lower romantic relationship satisfaction. In addition, the lower-order facets were all negatively associated with romantic relationship satisfaction, with 18 out of the 25 lower-order facets examined showing a significant association (see Table 2). There were no significant interactions with sex, with one exception, for risk taking, $p = .006$: Higher levels of risk

taking were associated with lower romantic satisfaction among males, $\beta = -0.21$, $SE = .10$, $p = .040$, but higher romantic satisfaction among females, $\beta = 0.29$, $SE = .15$, $p = .058$, though the latter effect was marginally significant. Taken together, and as expected, results of these individual-level analyses indicate that maladaptive personality traits are generally associated with lower romantic relationship satisfaction.

Co-Twin Control Analyses: Twin Difference Effects in Maladaptive Personality Traits and Romantic Relationship Satisfaction

Effects for individual-level analyses are fully confounded by genetic and shared environmental liability. Thus, we conducted follow-up co-twin control analyses to isolate twin difference effects—that is, MZ co-twin differences in levels of maladaptive personality traits. Results of these co-twin control analyses yielded significant twin difference effects for the higher-order domains Negative Affectivity, Detachment, Disinhibition, and Psychoticism (see Table 2). Many of the conceptually related lower-order facets also yielded significant twin difference effects: emotional lability, submissiveness, and (marginally) anxiousness (Negative Affectivity); anhedonia, depressivity, intimacy avoidance, and suspiciousness (Detachment); distractibility, irresponsibility (Disinhibition); and unusual beliefs (Psychoticism) (see Table 2). That is, twins with higher levels on these traits also had lower romantic relationship satisfaction relative to their co-twins with lower levels on these traits. In contrast, twin difference effects were nonsignificant for the higher-order domain Antagonism and its conceptually related lower-order facets deceitfulness and grandiosity, as well as the lower-order facets hostility, perseveration, and separation insecurity (Negative Affectivity); withdrawal (Detachment); and eccentricity and perceptual dysregulation (Psychoticism). That is, twins with higher levels on these traits had comparable romantic relationship (dis)satisfaction relative to their co-twins with lower levels on these traits. Taken together, the results of these co-twin control analyses are consistent with a potentially causal effect of Negative Affectivity, Detachment, Disinhibition, and Psychoticism, as well as several lower-order facets, on lower romantic relationship satisfaction, but suggest that the associations observed between Antagonism and the other lower-order facets and romantic relationship satisfaction are confounded by familial (genetic, shared environment) liability.

Secondary analyses: Twin difference effects in normal-range personality predicting romantic relationship satisfaction—Greater confidence in the potentially causal effects of personality pathology on romantic functioning comes from longitudinal assessment that allows for the temporal sequencing of constructs. Because the PID-5 was developed only recently, we could not explicitly test whether maladaptive personality traits, measured using the PID-5, predicted romantic relationship satisfaction in the present sample. However, twins did report on normal-range personality traits, using the MPQ, at age 29. Thus, we conducted secondary individual-level and co-twin control analyses to examine whether normal-range personality traits, as well as twin differences in normal-range traits, at age 29 predicted later romantic functioning at age 34. Results of individual-level analyses indicated that five of the six lower-order facets examined significantly predicted romantic relationship satisfaction (see Table 3). Higher levels of stress reaction, alienation, and aggression, and lower levels of well being and control predicted lower romantic relationship satisfaction. Follow-up co-twin control analyses yielded significant twin difference effects

for alienation and control—twins with higher levels of alienation and lower levels of control at age 29 had lower romantic relationship satisfaction at age 34 relative to their co-twins with lower levels on these traits (see Table 3). The results of these secondary analyses examining normal-range personality traits are generally comparable to those for maladaptive personality traits in showing associations with romantic dysfunction, while also lending longitudinal support to the potentially causal effects of personality for romantic functioning.

Secondary analyses: Twin difference effects in romantic relationship satisfaction predicting maladaptive personality traits—

Although the results of co-twin control analyses examining maladaptive personality traits are consistent with potentially causal effects of personality pathology on romantic functioning, because maladaptive personality traits and romantic relationship satisfaction were assessed at the same time point, it is not possible to rule out reverse causation—that lower romantic relationship satisfaction leads to higher levels of personality pathology. Thus, we conducted secondary individual-level and co-twin control analyses to examine whether romantic functioning, as well as twin differences in romantic functioning, at age 29 predicted personality pathology at age 34. Results of individual-level analyses indicated that romantic relationship satisfaction at age 29 was significantly and negatively associated with each of the five higher-order domains (see Table 4). That is, lower romantic relationship satisfaction at age 29 predicted higher levels of Negative Affectivity, Detachment, Antagonism, Disinhibition, and Psychoticism at age 34. In addition, romantic relationship satisfaction was negatively associated with all of the lower-order facets, with 16 out of the 25 lower-order facets examined showing a significant association (see Table 4). However, results of co-twin control analyses indicated the twin difference effects were nonsignificant for all of the 5 higher-order domains and 25 lower-order facets with only 2 exceptions: Twins with lower romantic relationship satisfaction at age 29 had higher levels of anxiety and withdrawal at age 34 relative to their co-twins with higher romantic relationship satisfaction (see Table 4). Taken together with the results of the primary analyses, the results of these secondary analyses are consistent with a prospective association between romantic dysfunction and later personality pathology, but are generally inconsistent with potentially causal effects of romantic functioning on personality pathology. Instead, the nonsignificant twin difference effects suggest the observed associations are accounted for by shared familial liability.

Discussion

The inclusion in *DSM-5* of an alternative model for personality disorders holds considerable promise for psychopathology research and treatment. Critical for moving the field forward is research that evaluates this model, the extent to which maladaptive personality traits reflect extreme variants of normal-range personality traits, and the implications of personality pathology for functioning in important domains. In the present report, we found that maladaptive personality traits, measured using the PID-5, were associated with lower romantic relationship satisfaction. We further extended the existing cross-sectional research by applying a causally informative approach, the MZ co-twin control study design, to examine potentially causal effects of personality pathology on romantic functioning unconfounded by genetic and shared environmental liability. Results of our co-twin control

analyses suggest that Negative Affectivity, Detachment, Disinhibition, and Psychoticism, as well as several lower-order facets, are potentially causally linked to lower romantic relationship satisfaction. In contrast, although the overall association for Antagonism and lower romantic relationship satisfaction was significant, the twin difference effects were weaker and not significant.

By demonstrating that higher levels of certain maladaptive personality traits are associated with lower romantic relationship satisfaction after accounting for the genetic and shared environmental factors that confer liability toward personality pathology and psychosocial dysfunction, the present results provide greater confidence in the causal implications of personality pathology for romantic functioning. Our secondary analyses lend additional longitudinal support in finding prospective associations between twin differences in alienation and control and later romantic functioning. We further found that twin differences in romantic functioning were generally not significantly associated with later personality pathology, inconsistent with a reverse causation explanation for our primary findings. Though requiring replication, taken together, these results provide preliminary support for the potentially causal effects of maladaptive personality pathology for interpersonal functioning.

It is important to note that the present report cannot speak to the specific mechanisms of the association between personality pathology and romantic relationship functioning. It is unlikely that maladaptive personality traits directly “cause” relationship dysfunction. Instead, these extreme variants of personality are likely manifested in problematic and aversive behaviors in interpersonal interactions and relationships (see Chmielewski et al., 2017; Decuyper et al., in press; Dowgwillo et al., 2016; Fossati et al., 2007; Simms & Calabrese, 2016; Williams & Simms, 2016; Williams et al., 2014; A. G. C. Wright et al., 2012; A. G. C. Wright et al., 2015) that erode romantic relationship quality over time. It is also possible that individuals with higher levels of personality pathology come into contact with and establish relationships with others who also have higher levels of personality pathology, which may lead to greater dysfunction. It is important to note that participants reported on their romantic relationship functioning only if they were currently involved with (married, living with, or dating for at least 3 months) a romantic partner. Thus, the present results cannot speak to individuals with levels of pathology severe enough to interfere with the establishment of a romantic relationship in the first place. Continued research on functioning in unselected relationships (e.g., classroom peers, co-workers) will prove informative.

Although the present report has a number of strengths, including the population-based sample and causally informative approach, it is important to also note several limitations. The MZ co-twin control study design offers greater causal inference than the typical cross-sectional study design by accounting for confounding genetic and environmental influences shared by twins within a twin pair, but this study design cannot speak to what accounts for differing levels of personality pathology within an MZ twin pair in the first place. Factors that are not shared by twins, such as other forms of psychopathology, stressful life events, or characteristics of romantic partners, may be confounded with maladaptive personality traits and romantic relationship functioning and warrant future research. In addition, the present

report relied on self-reports of both personality pathology and romantic relationship functioning. Although self-reports offer an important glimpse into an individual's perception of his or her own personality and functioning, the use of informant (e.g., romantic partners) reports may be necessary for obtaining a more complete or accurate understanding, particularly in the context of the lack of insight that may be characteristic at higher levels of personality pathology (see Decuyper et al., in press). The majority of the present population-based sample is unlikely to meet diagnostic criteria for a personality disorder, and the present results are likely less informative as to extreme levels of personality pathology. However, the significant associations highlight the dimensional nature of personality pathology and the importance of even subclinical maladaptive personality traits for functioning. Finally, the lack of racial and ethnic diversity in the sample limits generalizability.

In conclusion, the present report, which capitalized upon differences in levels of personality pathology within MZ twin pairs, identifies several potentially causal effects of maladaptive personality traits, conceptualized using the alternative model for personality disorders, on romantic relationship functioning. Results add to growing evidence that the alternative model captures extreme variants of normal-range personality that are manifested by comparably extreme deviations in thinking, feeling, and interacting with others that lead to impaired functioning; lend support to the reliability and validity of the PID-5; and have important implications for etiological models of psychopathology.

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General Scientific Summary

Pathological personality traits are associated with impairment in romantic relationships. By examining differences in levels of pathological traits in identical twins, this study found suggestive evidence that personality pathology may have causal implications for romantic relationship satisfaction.

Table 1

Descriptive Statistics for and Zero-Order Correlations Between PID-5 Maladaptive Personality Traits, MPQ Normal-Range Personality Traits, and DAS Romantic Relationship Satisfaction, and Intra-Pair Correlations

Measure	Descriptive Statistics				Zero-Order		Intra-Pair	
	Mean (SD)	Range	Skewness	Kurtosis	Alpha	r	r	r
PID-5 (age 34)								
Negative Affectivity	0.68 (0.43)	0.04 – 2.00	0.57	-0.48	.90	-.28***		.36***
Anxiousness	0.87 (0.63)	0.00 – 2.44	0.64	-0.56	.89	-.29***		.36***
Emotional lability	0.64 (0.53)	0.00 – 2.57	0.84	0.18	.83	-.16**		.34***
Hostility	0.73 (0.46)	0.00 – 2.20	0.65	0.10	.82	-.22***		.33***
Perseveration	0.57 (0.49)	0.00 – 2.22	0.77	0.04	.86	-.17**		.43***
Separation insecurity	0.54 (0.50)	0.00 – 2.57	1.08	0.94	.79	-.19**		.29***
Submissiveness	1.30 (0.62)	0.00 – 2.75	-0.36	-0.68	.76	-.11		.22***
Detachment	0.46 (0.39)	0.00 – 1.74	1.11	0.72	.93	-.32***		.30***
Anhedonia	0.54 (0.50)	0.00 – 3.00	1.52	3.06	.89	-.31***		.30***
Depressivity	0.26 (0.36)	0.00 – 2.07	2.09	4.99	.89	-.34***		.27***
Intimacy avoidance	0.20 (0.30)	0.00 – 1.50	1.80	3.02	.71	-.32***		.10
Restricted affectivity	0.80 (0.60)	0.00 – 2.57	0.59	-0.46	.85	-.12*		.34***
Suspiciousness	0.62 (0.43)	0.00 – 1.86	0.65	-0.15	.62	-.31***		.28***
Withdrawal	0.64 (0.59)	0.00 – 2.50	0.94	0.16	.92	-.22***		.33***
Antagonism	0.49 (0.36)	0.00 – 1.59	0.66	-0.35	.88	-.15*		.28***
Attention seeking	0.67 (0.58)	0.00 – 2.38	0.61	-0.53	.90	-.12*		.22***
Callousness	0.24 (0.29)	0.00 – 1.64	2.08	5.31	.80	-.10		.25***
Deceitfulness	0.31 (0.34)	0.00 – 1.50	1.28	1.07	.81	-.16**		.29***
Grandiosity	0.51 (0.42)	0.00 – 1.83	0.69	-0.19	.71	-.14*		.24***
Manipulativeness	0.66 (0.55)	0.00 – 2.40	0.59	-0.42	.77	-.08		.28***
Disinhibition	0.50 (0.40)	0.00 – 2.05	0.95	0.55	.92	-.22***		.28***
Distractibility	0.70 (0.59)	0.00 – 2.78	0.72	-0.25	.91	-.24***		.36***
Impulsivity	0.52 (0.50)	0.00 – 2.67	1.06	0.98	.83	-.06		.38***
Irresponsibility	0.27 (0.33)	0.00 – 1.86	1.46	2.32	.71	-.27***		.22***
Rigid perfectionism	0.87 (0.58)	0.00 – 2.80	0.64	0.01	.89	-.12*		.35***
Risk taking	1.10 (0.45)	0.00 – 2.79	0.33	0.53	.86	-.01		.33***

Measure	Descriptive Statistics					Zero-Order		Intra-Pair	
	Mean (SD)	Range	Skewness	Kurtosis	Alpha	<i>r</i>		<i>r</i>	
Psychoticism	0.29 (0.32)	0.00 – 1.85	1.43	2.17	.93	-.21***		.43***	
Eccentricity	0.38 (0.59)	0.00 – 2.62	1.66	2.85	.94	-.18**		.39***	
Perceptual dysregulation	0.22 (0.26)	0.00 – 1.58	1.86	4.54	.75	-.19**		.39***	
Unusual beliefs	0.28 (0.36)	0.00 – 1.50	1.42	1.40	.73	-.17**		.34***	
Stress reaction	39.16 (9.62)	19.00 – 67.00	0.27	-0.50	.91	-.19**		.74***	
Alienation	29.32 (8.14)	18.00 – 57.00	0.76	0.11	.92	-.27***		.74***	
Aggression	30.81 (7.48)	18.00 – 54.00	0.56	-0.07	.88	-.20***		.77***	
Well being	55.97 (8.24)	24.00 – 72.00	-0.46	0.75	.92	.28***		.70***	
Control	52.70 (7.78)	28.00 – 70.00	-0.34	0.15	.88	.13*		.69***	
Harm avoidance	50.78 (10.61)	20.00 – 72.00	-0.28	-0.47	.86	.07		.86***	
Relationship satisfaction	4.69 (0.50)	2.50 – 5.92	-0.70	1.95	.84	.45***		.14**	
Relationship satisfaction	4.63 (0.61)	1.83 – 5.92	-0.92	2.11	.88	–		.19**	

Notes. PID-5 = Personality Inventory for the *DSM-5*. DAS = Dyadic Adjustment Scale. Total *N* = 284 twins. Zero-order *r* is the correlation between age-34 PID-5 traits, age-29 MPQ traits, and age-29 DAS and age-34 DAS. Intra-pair *r* is the correlation between twins from intact twin pairs. *n* = 210 twins (from 105 intact twin pairs) for the PID-5 and DAS at age 34, *n* = 206 twins from (103 intact twin pairs) for the MPQ at age 29, and *n* = 172 twins (from 86 intact twin pairs) for the DAS at age 29.

Individual-Level and Co-Twin Control Analyses of Age-34 PID-5 Maladaptive Personality Traits and Age-34 DAS Romantic Relationship Satisfaction

Table 2

	Co-Twin Control Models			
	Individual-Level Models		Twin Difference Effects	
	Beta (SE)	p value	Beta (SE)	p value
PID-5 (age 34)				
Negative Affectivity	−0.40 (.08)	< .001	−0.37 (.16)	.021
Anxiousness	−0.28 (.06)	< .001	−0.18 (.11)	.098
Emotional lability	−0.23 (.07)	.002	−0.28 (.12)	.020
Hostility	−0.28 (.08)	< .001	−0.13 (.14)	.351
Perseveration	−0.20 (.08)	.011	−0.21 (.14)	.153
Separation insecurity	−0.21 (.07)	.004	−0.17 (.13)	.204
Submissiveness	−0.12 (.06)	.043	−0.27 (.09)	.005
Detachment	−0.51 (.09)	< .001	−0.50 (.16)	.002
Anhedonia	−0.37 (.07)	< .001	−0.27 (.12)	.028
Depressivity	−0.57 (.10)	< .001	−0.52 (.16)	.002
Intimacy avoidance	−0.63 (.11)	< .001	−0.69 (.15)	< .001
Restricted affectivity	−0.12 (.07)	.083	—	—
Suspiciousness	−0.44 (.08)	< .001	−0.47 (.14)	< .001
Withdrawal	−0.23 (.07)	< .001	−0.17 (.11)	.131
Antagonism	−0.25 (.11)	.022	−0.11 (.17)	.528
Attention seeking	−0.12 (.07)	.069	—	—
Callousness	−0.15 (.14)	.263	—	—
Deceitfulness	−0.28 (.11)	.015	−0.08 (.18)	.671
Grandiosity	−0.19 (.09)	.042	−0.08 (.14)	.580
Manipulativeness	−0.08 (.07)	.227	—	—
Disinhibition	−0.33 (.10)	< .001	−0.37 (.16)	.021
Distractibility	−0.25 (.06)	< .001	−0.28 (.10)	.007
Impulsivity	−0.07 (.08)	.350	—	—
Irresponsibility	−0.50 (.11)	< .001	−0.47 (.19)	.013
Rigid perfectionism	−0.11 (.07)	.079	—	—
Risk taking	−0.01 (.09)	.875	—	—

Co-Twin Control Models				
Individual-Level Models		Twin Difference Effects		
	Beta (SE)	p value	Beta (SE)	p value
Psychoticism	−0.40 (.12)	< .001	−0.43 (.21)	.044
Eccentricity	−0.22 (.08)	.005	−0.20 (.13)	.143
Perceptual dysregulation	−0.41 (.14)	.004	−0.30 (.24)	.218
Unusual beliefs	−0.30 (.10)	.004	−0.37 (.18)	.041

Notes. Results of individual-level linear mixed models (LMMs) and co-twin control models. Individual-level analyses examined associations between maladaptive personality (higher-order domains and lower-order facets), measured using the Personality Inventory for the DSM-5 (PID-5), at age 34 and romantic relationship satisfaction, measured using a brief version of the Dyadic Adjustment Scale (DAS), at age 34; individual-level analyses consider twins as individuals and were conducted in the full sample, $N = 284$ twins, and models included random intercepts at the twin-pair level to account for the interdependence of the twin data. Significant individual-level associations were followed up using co-twin control analyses to examine twin difference effects (co-twin control analyses were not conducted for nonsignificant individual-level associations, noted in the table with a dash); co-twin control analyses consider differences within a twin pair and were conducted in the sample of intact twin pairs, $n = 210$ twins (from 105 intact twin pairs), with random intercepts at the twin-pair level to account for the twin data. All models included participant age and sex as covariates.

Table 3

Individual-Level and Co-Twin Control Analyses of Age-29 MPQ Normal-Range Personality Traits and Age-34 DAS Romantic Relationship Satisfaction

		Co-Twin Control Models			
		Twin Difference Effects			
		Beta (<i>SE</i>)	<i>p</i> value		
MPQ (age 29)	Stress reaction	−0.12 (.04)	.003	−0.05 (.07)	.452
	Alienation	−0.20 (.05)	< .001	−0.21 (.08)	.008
	Aggression	−0.17 (.05)	.002	−0.08 (.09)	.396
	Well being	0.20 (.04)	< .001	0.02 (.08)	.793
	Control	0.12 (.05)	.014	0.22 (.07)	.002
	Harm avoidance	0.05 (.04)	.248	—	—

Notes. Results of individual-level linear mixed models (LMMs) and co-twin control models. Individual-level analyses examined associations between normal-range personality, measured using the Multidimensional Personality Questionnaire (MPQ), at age 29 and romantic relationship satisfaction, measured using a brief version of the Dyadic Adjustment Scale (DAS), at age 34; individual-level analyses consider twins as individuals and were conducted in the full sample, $N = 230$ twins, and models included random intercepts at the twin-pair level to account for the interdependence of the twin data. Significant individual-level associations were followed up using co-twin control analyses to examine twin difference effects (co-twin control analyses were not conducted for nonsignificant individual-level associations, noted in the table with a dash); co-twin control analyses consider differences within a twin pair and were conducted in the sample of intact twin pairs, $n = 206$ twins (from 103 intact twin pairs), with random intercepts at the twin-pair level to account for the twin data. All models included participant age and sex as covariates.

Individual-Level and Co-Twin Control Analyses of Age-29 DAS Romantic Relationship Satisfaction and Age-34 PID-5 Maladaptive Personality Traits

Table 4

	Individual-Level Models			Co-Twin Control Models		
	Twin Difference Effects					
	Beta (SE)	p value	Beta (SE)	Beta (SE)	p value	p value
PID-5 (age 34)						
Negative Affectivity	-.019 (.05)	< .001	-.003 (.07)			.647
Anxiousness	-.037 (.07)	< .001	-.022 (.09)			.023
Emotional lability	-.017 (.07)	.013	-.001 (.10)			.940
Hostility	-.018 (.05)	< .001	-.006 (.08)			.450
Perseveration	-.023 (.06)	< .001	-.008 (.08)			.302
Separation insecurity	-.003 (.06)	.619	–			–
Submissiveness	-.013 (.07)	.076	–			–
Detachment	-.023 (.05)	< .001	-.008 (.07)			.257
Anhedonia	-.027 (.06)	< .001	-.000 (.09)			.963
Depressivity	-.024 (.04)	< .001	-.003 (.07)			.656
Intimacy avoidance	-.013 (.04)	.002	-.002 (.07)			.769
Restricted affectivity	-.016 (.06)	.016	-.005 (.10)			.626
Suspiciousness	-.020 (.05)	< .001	-.003 (.07)			.668
Withdrawal	-.031 (.06)	< .001	-.020 (.09)			.023
Antagonism	-.010 (.04)	.021	-.006 (.06)			.337
Attention seeking	-.012 (.07)	.095	–			–
Callousness	-.006 (.03)	.092	–			–
Deceitfulness	-.015 (.04)	< .001	-.009 (.05)			.081
Grandiosity	-.005 (.05)	.374	–			–
Manipulativeness	-.012 (.06)	.064	–			–
Disinhibition	-.017 (.05)	< .001	-.006 (.07)			.346
Distractibility	-.030 (.07)	< .001	-.018 (.10)			.095
Impulsivity	-.011 (.06)	.067	–			–
Irresponsibility	-.012 (.04)	.003	-.001 (.06)			.812
Rigid perfectionism	-.003 (.07)	.647	–			–
Risk taking	-.000 (.05)	.977	–			–

Co-Twin Control Models				
Individual-Level Models			Twin Difference Effects	
	Beta (<i>SE</i>)	<i>p</i> value	Beta (<i>SE</i>)	<i>p</i> value
Psychoticism	−0.15 (.04)	< .001	−0.08 (.05)	.093
Eccentricity	−0.23 (.06)	< .001	−0.14 (.08)	.071
Perceptual dysregulation	−0.13 (.03)	< .001	−0.08 (.04)	.079
Unusual beliefs	−0.10 (.04)	.023	−0.20 (.06)	.003

Notes. Results of individual-level linear mixed models (LMMs) and co-twin control models. Individual-level analyses examined associations between romantic relationship satisfaction, measured using a brief version of the Dyadic Adjustment Scale (DAS), at age 29, and maladaptive personality (higher-order domains and lower-order facets), measured using the Personality Inventory for the DSM-5 (PID-5), at age 34; individual-level analyses consider twins as individuals and were conducted in the full sample, $n = 277$ twins, and models included random intercepts at the twin-pair level to account for the interdependence of the twin data. Significant individual-level associations were followed up using co-twin control analyses to examine twin difference effects (co-twin control analyses were not conducted for nonsignificant individual-level associations, noted in the table with a dash); co-twin control analyses consider differences within a twin pair and were conducted in the sample of intact twin pairs, $n = 172$ twins (from 86 intact twin pairs), with random intercepts at the twin-pair level to account for the twin data. All models included participant age and sex as covariates.