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Agreement Between Self and Informant-Reported Ratings of Personality Traits: The Moderating Effects of Major Depressive and/or Panic Disorder

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Abstract

Several personality traits are risk factors for psychopathology. As symptoms of psychopathology may influence self-rated personality, informant-reports of personality are also sometimes collected. However, little is known about self-informant agreement in individuals with anxiety and/or depression. We investigated whether self-informant agreement on positive and negative affectivity (PA and NA), and anxiety sensitivity differs for individuals with major depression (MDD) and/or panic disorder (PD, total $n=117$). Informant- and self-reported PA was correlated among those with MDD, but not those without MDD. Informant- and self-reported anxiety sensitivity was correlated among those with PD, but not those without PD. Informant- and self-reported NA was correlated irrespective of diagnosis. Results indicate that the agreement of self and informant-reported personality may vary as a function of depression and/or anxiety disorders.

Keywords

Self-informant agreement; Panic disorder; Major depressive disorder; informant-reported personality

1. Introduction

Anxiety and depressive disorders are highly prevalent internalizing psychopathologies associated with significant impairment across multiple domains of life (Byers et al., 2010; Kessler et al., 2012). Comprehensive assessment of personality can aid in the identification of individuals at risk for internalizing psychopathology, and provide valuable information about prognosis (Bagby et al., 2008; Clark et al., 1997; Mulder, 2002). For example, high negative affectivity (NA) during adolescence longitudinally predicts the development of mood and anxiety pathology in adulthood (Kendler et al., 2006; Krueger, 1999; Wetter and Hankin, 2009). Heightened anxiety sensitivity, or the tendency to experience distress in response to benign bodily sensations associated with anxiety (e.g., heart racing or nausea),

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may connote risk for panic disorder (PD; McNally, 2002; Schmidt et al., 1997), but not depression (Schmidt et al., 1998). In contrast, reduced positive affectivity (PA) has been implicated in the pathogenesis of depressive, but not certain anxiety disorders (Shankman and Klein, 2003; Watson et al., 1988).

A common method of ascertaining information about personality and temperament is by self-report interviews or questionnaires that require self-assessment of one's own trait-like tendencies or dispositions. However, self-ratings of personality traits obtained from individuals with a current mood or anxiety disorder may not be indicative of their premorbid personality (Griens et al., 2002; Ormel et al., 2004). Longitudinal studies have suggested that changes in depressive symptoms are associated with mean-level changes in how individuals rate themselves on personality measures over time (De Fruyt et al., 2006; Hirschfeld et al., 1983; Jylha et al., 2009; Ormel et al., 2004), even when personality assessments are administered only twelve weeks apart (Griens et al., 2002). Similarly, Reich and colleagues (1983) found significant mean-level changes in self-reported personality after just six weeks among PD patients who responded to alprazolam treatment.

Some have argued that such changes in self-reported personality occur because psychopathology hinders an individual's ability to objectively assess his or her own personality (Klonsky, Oltmanns & Turkheimer, 2002; Reich et al., 1986; Wetzler et al., 1990). In an effort to obtain a more complete picture of an individual's personality, researchers sometimes have family members or close friends (i.e., informants) provide personality trait ratings for the proband (i.e., the individual whose personality is of interest; Clark, 2007; Klonsky et al., 2002; Zimmerman et al., 1986). High concordance between self- and informant-reports of personality can be interpreted as evidence in support of the validity of self-reported personality (Funder and West, 1993; Ready and Clark, 2002; Yang et al., 1999). The practice of using self-informant agreement to evaluate accuracy is grounded largely in the assumption that informant-reports of personality are less biased by the proband's psychopathology and social desirability, and thus more "objective" than self-reports of personality (Funder and West, 1993; Mosterman & Hendriks, 2011; Pilgrim and Mann, 1990; Yang et al., 1999).

Others have argued that self-reported personality is not biased by psychopathology, and that changes in self-ratings of personality traits may represent a lasting change in personality, or "scar effect", that occurs as a result of anxiety or depression (Bagby et al., 1998; Kendler et al., 1993). Self-reported personality would therefore result in trait ratings that are indicative of one's post-morbid, but not premorbid personality. Thus, self- and informant-ratings of personality obtained from those with internalizing psychopathology may each be valid, but represent different aspects of an individual's disposition. It is also important to note that, although the absolute stability of self-reported personality might be influenced by anxiety and depression, other forms of stability may remain intact (i.e., differential, individual-level, and ipsative stability; De Fruyt et al., 2006), suggesting that self-reported personality is not entirely unstable among those with internalizing psychopathology.

Indeed, when self- and informant-reports do not entirely correspond each report may have incremental validity (Clifton et al., 2004; Galione and Oltmanns, 2013). For example, Klein

(2003) found that, among individuals with personality disorders, informant-reports of personality added incremental validity to self-reports in predicting depressive symptoms and global functioning at follow-up. Obtaining self- and informant-reports of personality may therefore be particularly valuable when the two sources provide divergent information, as each source may add to the predictive utility of personality assessment. Conversely, if self-informant agreement is high, obtaining both reports may be unnecessary. Therefore, determining whether self-informant concordance rates on personality measures are higher or lower in certain populations may prove valuable for guiding clinicians and researchers as to when gathering assessments from both sources may be most beneficial

In non-clinical samples, self-informant agreement on personality is typically modest but significant (Connolly et al., 2007; Klonsky et al., 2002). Importantly, agreement has been found to differ by trait, agreement higher for those traits that are more observable, such as agreeableness or extraversion, relative to more ‘internal’ traits, such as neuroticism (Clifton et al., 2004; Funder and Colvin, 1988; Funder and Dobroth, 1987). That is, traits associated with visible behavioral manifestations tend to yield greater self-informant agreement than those traits associated with more private or less outwardly expressed behavioral manifestations. The self-other asymmetry model (SOKA; Vazire, 2010) theorizes about these findings and postulates that agreement is poorer for internal traits because informants may be less *accurate* than probands when assessing traits associated with fewer observable behaviors.

Given that that anxiety and depression are internalizing disorders, it is possible that personality traits relevant to those diagnoses yield poor self-informant agreement. However, this question remains relatively unexplored. In the broader literature, self-informant agreement on personality disorder diagnoses in clinical samples have yielded correlations ranging from .18 to .80 (Klonsky et al., 2002). Only two studies to date have examined self-informant agreement on Big Five personality traits among those with depression. Bagby et al. (1998) found self- and informant-ratings on the Revised NEO Personality Inventory to be highly similar ($r > .50$) among a sample of individuals with unipolar depression, an agreement that is comparable if not slightly higher than what has been found across some non-clinical samples. Ready and Clark (2002) found that there were no differences in agreement between individuals with a personality disorder with and without comorbid depression on the Big Five Inventory (BFI) and the Schedule for Nonadaptive and Adaptive Personality (SNAP). Interestingly, however, self-informant agreement on ratings of openness was higher for those with depression than those without.

Taken together, the studies above suggest that concordance between self- and informant-ratings of personality among individuals with depression may be comparable to, if not higher than, concordance among those without. However, to our knowledge no study to date has compared self-informant concordance rates for those with depression, relative to those without a history of psychopathology, within the same sample. More importantly, no study has examined the impact of depression, and other internalizing disorders such as anxiety, on the relationship between self- and informant-reports of traits known to connote risk for internalizing disorder onset and maintenance – specifically, PA, NA and anxiety sensitivity. Given that measures of personality are regularly collected in both research and clinical

settings, examining factors that could influence the relation between such reports is critical. In sum, the present study investigated whether self-informant agreement on personality trait ratings varies as a function of whether the individual has no history of psychopathology, a diagnosis of major depressive disorder (MDD), PD, or comorbid MDD and PD.

In order to obtain a comprehensive assessment of the tendencies to experience positive and negative emotions (i.e., PA and NA), the present study used a battery of questionnaires that have previously found to yield correlated indicators of these broader tendencies. Specifically, (1) neuroticism, negative emotionality, anxiety sensitivity, and behavioral inhibition have all been shown to correlate and be indicators of NA and (2) extraversion, positive emotionality, reward sensitivity, and behavioral activation have all shown to correlate and be indicators of PA (e.g., Carver & White, 1994; Hagopian & Ollendick, 1996; Heubeck, Wilkinson & Cologon, 1998; Jorm et al., 1998; Smits & Boeck, 2006). Agreement was therefore examined on factor analytically derived composites of PA and NA, so as to reduce the potential impact of method variance on our analyses of self-informant agreement (Elliott & Trash, 2002). Agreement on the measure of anxiety sensitivity was also examined separately, given its relevance to PD (McNally, 2002; Schmidt et al., 1997). Mean-level differences between self and informant-reports were also examined to evaluate for systematic reporting biases (i.e., whether probands reported significantly lower or higher levels of a given trait than their respective informants).

Based on findings to date, we expected informant-reports to be positively associated with self-reports of personality across all participants. Due to the limited extant literature on the potential moderating effects of anxiety on the concordance between self- and informant-ratings on questionnaire measures of personality, we did not have specific hypotheses as to whether the relationship between self- and informant-reports would differ between diagnostic groups (i.e., healthy controls, MDD, PD, or comorbid PD and MDD). It is possible that individuals with MDD and/or PD could exhibit certain 'internal' traits (e.g., anxiety sensitivity or NA) more outwardly than those without that disorder, which could result in superior self-informant agreement for those with that disorder (Carlson, Vazire & Oltmanns, 2013; Clifton et al., 2004; Funder and Colvin, 1988; Funder and Dobroth, 1987; Vazire, 2010). However, prior studies have suggested that mood and anxiety symptoms may bias proband reports leading to poor agreement between self- and informants across all three diagnostic groups (e.g., Zimmerman et al., 1988).

2. Methods

2.1 Participants

Data from the present study was collected as part of a larger investigation on laboratory measures of emotional processing, for which the complete procedure can be found elsewhere (Shankman et al., 2013). In brief, self-report measures of personality and temperament were collected from four groups of individuals (i.e., probands; $N = 208$), those with: (1) no history of Axis I psychopathology (i.e., healthy controls; $n = 82$), (2) current MDD and no lifetime history of PD (i.e., MDD-only group; $n = 40$), (3) current PD and no lifetime history of MDD (i.e., PD-only group; $n = 28$), (4) current PD and MDD (i.e.,

comorbid PD and MDD group; $n = 58$). Thus, the study was a 2 (MDD status: yes vs. no) X 2 (PD status: yes vs. no) design.

Diagnoses were made via the Structured Clinical Interview for DSM-IV (SCID; First et al., 1996). SCIDs were conducted by the last author and advanced clinical psychology doctoral students. Diagnosticians were trained to criterion by viewing the SCID-101 training videos (Biometrics Research Department, New York, NY), observing two or three joint SCID interviews with the last author, and completing three SCID interviews (observed by the last author or an advanced interviewer) in which diagnoses were in agreement with the observer. Twenty SCIDs were audio re-corded and scored by a second rater blind to original diagnoses to determine reliability of diagnoses. Inter-rater reliability indicated perfect agreement for PD and MDD diagnoses ($kappas = 1.00$).

Participants were recruited from the community (via fliers, Internet postings, etc.) and area mental health clinics. Participants in PD-only and comorbid groups were allowed to have other current or past anxiety disorders, whereas participants in the MDD-only group were not allowed to have a lifetime history of any anxiety disorders. In addition, due to the aims of the larger study (and to reduce the heterogeneity of those with MDD), all individuals with MDD had an early onset of dysthymia or MDD (i.e., prior to age 18). Participants were excluded if they had a lifetime diagnosis of a psychotic disorder, bipolar disorder, or dementia; were unable to read or write in English; had a history of head trauma with loss of consciousness; or were left-handed (left-handedness was confirmed using the Edinburgh Handedness Inventory; Oldfield, 1971).

Informant-reports were completed and returned for 117 (51%) of the 208 probands (PD-only = 15), MDD-only = 21), comorbid PD and MDD = 28), controls = 53). Of the probands that had informant data, 51.3% were Caucasian, 26.5% were African-American, 7.7% were Hispanic, and 14.5% were Asian, and 65% were female. The mean age of this sample was 33.29 ($SD = 12.71$). 17.1% of participants in the present study were currently taking psychotropic medication, and 13.7% were currently engaged in outpatient treatment. The mean global assessment of functioning (GAF) score was 69.21 ($SD = 18.04$).

Probands with informant-reports returned to the laboratory did not differ from those without in ethnicity, $X^2 (3, N = 208) = 4.70, ns$, gender, $X^2 (1, N = 208) = .12, ns$, depression status, $X^2 (2, N = 208) = 2.94, ns$, panic status, $X^2 (2, N = 208) = 2.33, ns$, or age, $F (1, 198) = .04, ns$. Likewise, there were no mean-level differences in NA, $F (1, 198) = .00, ns$, PA, $F (1, 198) = .12, ns$, or anxiety-sensitivity, $F (1, 198) = 1.23, ns$, between probands for whom informant-reports of personality were obtained, relative to probands for whom informant-reports were not obtained.

2.2 Procedure

After providing informed consent, proband participants were administered a battery of self-report personality questionnaires. Participants were also asked to provide contact information for a family member or close friend who could serve as an informant to complete a packet of questionnaires about the proband's "qualities and characteristics". All probands were compensated in cash for their time.

A laboratory member contacted informants by phone to determine their willingness to participate. Both informants and probands were assured that their ratings would not be viewed by the other. Informant-reports were identical to the self-report measures collected, however, informant-report measures were reworded from first to third person either by the developers of the scales or with permission from the developers. Informants who returned the packets were paid \$20 for their participation. Successfully contacting informants and obtaining informant-reports of personality for a clinical sample was a challenging endeavor. Consequently, there were an unintended number of days spanned between the administration of self- and informant-reports. In particular, the numbers of days spanned between the administration of self- and informant-reports was skewed with a mean of 318.15 ($SD = 377.18$), but a median of 243. All procedures were approved by the University of Illinois-Chicago's Institutional Review Board.

2.3 Measures

GTS and GTS-IR—The General Temperament Scale (GTS; Clark and Watson, 1990) is a 90-item true-false questionnaire that yields scores for negative and positive temperament. Higher scores on the negative temperament subscale indicate a tendency to experience negative emotions such as sadness or anger, whereas higher scores on the positive temperament subscale indicate a tendency to experience positive emotions, such as happiness or excitement. Cronbach's alphas were .90 and .93 for self-reports of PE and NE, and .88 and .91 for informant-reports of PE and NE, respectively.

EPQ-R and EPQ-R-IR—Eysenck's Personality Questionnaire (EPQ; Eysenck, Eysenck & Barrett, 1985) is a 100-item questionnaire with yes or no answer options. The EPQ yields scores for neuroticism and extraversion. Cronbach's alphas were .93 and .74 for self-reports of neuroticism and extraversion, and .90 and .71 for informant-reports of neuroticism and extraversion, respectively.

TEPS and TEPS-IR—The Temporal Experience of Pleasure Scale (TEPS; Gard et al., 2006) is an 18-item questionnaire, which requires participants to indicate yes or no to each item. The TEPS is designed to assess trait differences in ability to derive pleasure from the anticipation and consummation of reward. Cronbach's alphas were .87 and .83 for self-reports and informant-reports of reward processing, respectively.

ASI-R and ASI-R-IR—The Anxiety Sensitivity Index-Revised (ASI-R; Taylor and Cox, 1998) is 36-item revised version of the original ASI developed by Reiss et al (1986). Statements are rated on a five-point scale ranging from "very little" to "very much." The ASI is designed to assess the extent to which an individual experiences fear or distress in response to physiological indicators of anxiety, such as heart racing or nausea. Cronbach's alphas were .96 and .97 for self-reports and informant-reports of anxiety sensitivity, respectively.

BIS/BAS Scale and BIS/BAS Scale-IR—The Behavioral Inhibition System/Behavioral Activation System Scale (BIS/BAS Scale; Carver and White, 1994) includes 26-items rated on a four-point scale ranging from "very true" to "very false." The BIS/BAS has two

subscales: behavioral inhibition and behavioral activation. The BIS scale assesses the tendency of individuals to experience negative affect or withdrawal behaviors in response to stimuli. The BAS scale assesses the tendency of individuals to experience positive affect or approach behaviors in response to stimuli. Cronbach's alphas were .86 and .91 for self-reports of BIS and BAS, and .81 and .90 for informant-reports of BIS and BAS, respectively.

2.4 Calculation of NA and PA Factor Scores

Missing questionnaire items were imputed using the participant's own average response on the missing item's subscale. There were five probands for whom informants had returned packets that were missing substantial numbers of items from specific questionnaires (i.e., the entire backside of the EPQ-R). In order to avoid over-inferring an informant's responses, we chose not to interpolate item-level responses if more than 20% of a questionnaire's items were missing. However, we did calculate factor scores (see below) for these subjects using a combination of the participant's available data and the average of their group (i.e., control, PD, MDD). More specifically, missing subscale scores were imputed using the average z-score for that participant's diagnostic group. Z-scores were then multiplied by the appropriate factor loading and added together to generate a factor score.

As mentioned earlier, in order to reduce method variance for all analyses (Elliot and Thrash, 2002), we conducted principle component factor analyses using a varimax rotation, independently for each self- and informant-reports. Factors with eigenvalues above one were extracted from the factor analyses of self- and informant-measures (Ford, Macullum & Tait, 1986). We also examined the scree plots generated from our factor analyses to further ensure that extracting two factors was indeed appropriate (i.e., the eigenvalues visibly dropped substantially after two factors; Fabrigar et al., 1999). As predicted, factor analyses revealed the same two-factor structure for self- and informant-reports of personality. Overall reward processing (TEPS), positive emotionality (GTS), extraversion (EPQ), and behavioral activation (BIS/BAS), loaded positively onto a PA factor. Anxiety sensitivity (ASI), negative emotionality (GTS), neuroticism (EPQ), and behavioral inhibition (BIS/BAS) loaded onto an NA factor (see Table 1).

Gender and age of the proband, and number of days spanned in between completion of the self- and informant-report were included as covariates for all analyses described below. All continuous variables were mean-centered. Diagnostic variables included in the analyses were MDD (yes/no) and PD (yes/no). This 2x2 between subjects design is ideal for the present purpose. Studies that do not have the fully crossed design (e.g., only three of the cells) attempt to examine the separate effects of depression or anxiety by "covarying out" the effects of one or the other, an approach that is not ideal (see Miller and Chapman, 2001 for a full description of the flaws of this approach). In other words, the present 2 X 2 design allows for the examination of the main effects of PD and MDD without confounding those effects.

2.5 Data Analysis Plan

2.5.1 Rank-order Agreement—We conducted three hierarchical regression analyses to examine the concordance between self- and informant-reports of NA, PA and ASI. Scores on informant-reports were included as an independent variable, and scores on self-reports as the dependent variable for each regression. MDD and PD were included as separate moderators. For the analysis of self-informant agreement on each measure, covariates were entered in block one, and the main effects PD, MDD, and informant-rated personality were entered in block two. The two-way interactions of informant-rated personality x MDD, and informant-rated personality x PD status were entered in block three. This is the key step in the model as it examines whether diagnosis moderates the association of self and informant ratings. Finally, the three-way interaction of MDD x PD x informant-rated personality were entered in block four. However, the 3-way interaction term was subsequently removed from the model because there was no effect of comorbidity on rank-order agreement for any of the traits examined. Significant interactions of diagnosis by self-reported personality were followed up by examining the simple slopes (Aiken and West, 1991) of informant-rated personality for individuals with and without the diagnosis.

2.5.2 Mean-level Differences—We conducted three, three-way mixed effects ANOVAs to examine whether informants rated probands at different average levels on NA, PA, and ASI than proband's rated themselves and whether this difference was moderated by diagnosis. Source of personality ratings (self- vs. informant-reported) were entered as within-subjects factors, and MDD status and PD status as between-subjects factors. Source by diagnoses interactions were followed-up to evaluate the directionality of the effect for that diagnostic group. Finally, analogous to the rank-order analyses, because there was no three-way interaction on mean-levels of NA, PA, or ASI-R, this interaction term was subsequently removed from mean-level analyses.

3. Results

3.1 Self-Informant Agreement on Positive Affectivity

There was a significant positive relationship between self- and informant-reported PA when collapsed across diagnostic groups. There was also a main effect of MDD on self-reported PA, such that PA was lower among those with MDD, relative to those without. However, there was no main effect of PD on self-reported PA and the relationship between self- and informant-reports of PA was not moderated by PD (see Table 2). Most importantly, MDD moderated the relationship between self- and informant-reported PA. Follow-up analyses indicated that informant-reports positively predicted self-reports among those with MDD, $\beta = .63$, $t(116) = 3.50$, $p < .05$, but not among those without, $\beta = .19$, $t(116) = 1.62$, *ns* (see Figure 1).

There were no mean-level differences between self- and informant-reports of PA when collapsed across diagnostic groups, $F(1, 111) = .34$, *ns*, $\eta_p^2 = .00$. Likewise, there was no two-way interaction of PD status x source of personality report, $F(1, 111) = .00$, *ns*, $\eta_p^2 = .00$, or MDD status x source of personality report, $F(1, 111) = .72$, *ns*, $\eta_p^2 = .01$, on PA.

3.2 Self-Informant Agreement on Negative Affectivity

There was a significant positive relationship between self- and informant-reported NA. There was also a main effect of PD on self-reported NA, and MDD on self-reported NA, such that NA was higher among those with PD and MDD, relative to those without. The association between self- and informant-reported NA was not moderated by MDD status or PD status (see Table 3). There were also no mean-level differences between self- and informant-reports of NA when collapsed across diagnostic groups, $F(1, 111) = .46$, ns , $\eta_p^2 = .01$. In addition, there was no PD status $\times$ source of personality report interaction, $F(1, 111) = 3.07$, ns , $\eta_p^2 = .03$, or MDD status $\times$ source of personality report on NA, $F(1, 111) = .28$, ns , $\eta_p^2 = .00$.

3.3 Self-Informant Agreement on Anxiety Sensitivity

There was a significant positive relationship between informant- and self-reported anxiety sensitivity, and a main effect of PD on self-reported anxiety sensitivity. Individuals with PD reported higher levels of anxiety sensitivity than those without. Likewise, there was a main effect of MDD on self-reported anxiety sensitivity, such that individuals with MDD reported higher levels of anxiety sensitivity than those without. The relation between self- and informant-reported was moderated by PD status (see Table 4). Follow-up analysis indicated that informant-reports positively predicted self-reports of anxiety sensitivity among those with PD, $\beta = .52$, $t(114) = 4.60$, $p < .05$, but not among those without, $\beta = .26$, $t(114) = .66$, ns (see Figure 2). Agreement on anxiety sensitivity was not moderated by MDD, $\beta = .05$, ns .

Finally, there were no mean-level differences between self- and informant-reports of anxiety sensitivity when collapsed across diagnostic groups, $F(1, 109) = 1.67$, ns , $\eta_p^2 = .02$. There was also no two-way interaction of MDD status $\times$ source of personality report, $F(1, 109) = .10$, ns , $\eta_p^2 = .00$. However, there was an interaction of PD status $\times$ source of personality report, $F(1, 109) = 4.54$, $p < .05$, $\eta_p^2 = .04$. Follow-up comparisons revealed mean-level differences between self- and informant-reported anxiety sensitivity among those without PD, $F(1, 73) = 14.70$, $p < .05$, $\eta_p^2 = .17$, such that informant-ratings of anxiety sensitivity were higher ($M = 47.13$, $SD = 29.76$) than self-ratings of anxiety sensitivity among those without PD ($M = 32.72$, $SD = 21.04$). There were no mean-level differences between self- and informant-reports of anxiety sensitivity among those with PD, $F(1, 40) = .10$, ns , $\eta_p^2 = .00$ (see Figure 2).

4. Discussion

The present study investigated the relationship between self- and informant-ratings of NA, PA, and AS, and whether this relationship differed as a function of whether the proband had a diagnosis of PD and/or MDD. Results overall suggest that self-informant agreement on NA, PA, and AS among those with PD and/or MDD is comparable to, and for some traits better than, agreement among healthy controls. In particular, across all participants, self- and informant-reports of NA were moderately positively correlated. However, for PA and AS, diagnosis moderated self-informant agreement. Below we discuss the results for each of the personality domains.

4.1. Positive Affectivity

The present study found that depression moderated self-informant agreement on PA, such that informant-reports were not associated with self-reports among those without MDD, but were positively associated for those with MDD. Importantly, we found no evidence of reporting biases in individuals with MDD as there were no mean-level differences between self- and informant- reports of PA. It is therefore possible that the moderating effect of depression may reflect that deficits in PA are especially noticeable or salient to informants of probands with MDD. In other words, because individuals with MDD have overall lower PA (consistent with many prior studies: Clark and Watson, 1991; Shankman and Klein, 2003; Shankman et al., 2013; Watson et al., 1988), this trait may be a more noticeable characteristic of their personality than among those without MDD. Consistent with this hypothesis, previous studies have found that the behavioral correlates of PA are visible social behaviors, such as laughing and being talkative in the presence of others (Funder and Colvin, 1988; Funder and Dobroth, 1987; Watson et al., 2000). Thus, it may be that the failure or absence of these social behaviors captures the attention of others, as it is atypical. This enhanced recognition may translate into greater self-informant agreement (Vazire, 2010).

Alternatively, the moderating effect of MDD on self-informant agreement may be due to differences in the consistency of PA exhibited by those with MDD, relative to those without a history of MDD. It has been suggested that self-informant agreement is superior for those traits self-rated as highly consistent across situations and time, relative to those self-rated as highly inconsistent (Bem and Allen, 1974; Funder and Dobroth, 1987). Individuals without a history of MDD may exhibit more variability in PA throughout life (and in their interactions with informants) than those with MDD. This tendency to exhibit greater fluctuations in PA over the lifespan could lead to inconsistent reporting by informants. Conversely, individuals with MDD may exhibit *consistently* low PA, which may enhance the ratability and inter-rater reliability of PA for those MDD.

4.2 Anxiety Sensitivity

Interestingly, the anxiety sensitivity findings were akin to the PA/MDD findings. PD moderated the relationship between self- and informant-reports of anxiety sensitivity, a trait that is particularly relevant to the development of PD (McNally, 2002; Schmidt et al., 1997; Schmidt et al., 1998). More specifically, there was a positive relationship between self- and informant-reports of anxiety sensitivity among those with PD, whereas this relationship was not significant for those without PD. Comparable to PA among those with MDD, anxiety sensitivity may be a more stable trait among those with PD than among those without. As mentioned above, this consistency may have yielded greater self-informant agreement (Bem and Allen, 1974; Funder and Dobroth, 1987).

Alternatively, given that anxiety sensitivity was higher among those with PD, relative to those without, anxiety sensitivity may be a trait that is highly perceptible to others when heightened. Traits have been found to vary in perceived visibility to informants based on how often there are opportunities to perceive trait confirming or disconfirming behaviors (Funder and Colvin, 1988; Funder and Dobroth, 1987). According to Vazire's SOKA model

(2010), informants may therefore be less accurate than probands when rating ‘internal’ traits. Vazire suggests that this may be in part due to probands having privileged access to their own physiological states (Carlson, Vazire & Oltmanns, 2013). Given that anxiety sensitivity is associated with physiological sensations and cognitions about those sensations, individuals may in fact have privileged access to information necessary for judging this trait.

However, among those with PD, there may be more frequent opportunities to observe the behavioral correlates of anxiety sensitivity. For example, an individual with PD may verbally or physically express to others distress over their bodily sensations (e.g., concern that heart racing). In contrast, individuals without PD are not likely to express this level of distress about benign physical symptoms, leaving informants of those without PD, unaware of their respective proband’s level of anxiety sensitivity. That is, anxiety sensitivity may “not come up” for non-PD participants leaving the informant unsure as to the proband’s levels of the trait.

Indeed, in the current study, informant-ratings of anxiety sensitivity were significantly higher than self-ratings of anxiety sensitivity on average among those without PD, and there were no mean-level differences between self- and informant-reports among those with PD. This discrepancy may suggest that informants of those without PD may have overestimated the proband’s AS due to excessive speculation.

4.3 Negative Affectivity

Unlike PA and anxiety sensitivity, self-informant agreement on NA was not moderated by diagnosis, although there was a significant positive association between self- and informant-reports of NA across the entire sample. Self-reported NA was higher among those with either PD or MDD, than healthy controls, and there were no mean-level differences between self- and informant-reports of NA across diagnostic groups, again suggesting that there was no systematic reporting bias among individuals with PD or MDD. Thus, despite the role of heightened NA in the development of anxiety and depression (Kendler et al., 2006; Krueger, 1999; Wetter and Hankin, 2009), the agreement between self- and informant-reports of NA may not differ for those with internalizing psychopathology (or at least MDD and PD), relative to those without. Although speculative, it is possible that NA is not *relatively* more noticeable to informants of those with internalizing psychopathology, because of the heterogeneous nature of the behavioral correlates of NA. That is, NA manifests in a variety of ways (e.g., crying, yelling, avoidance, rumination) and this variation may be consistent across all diagnostic groups.

4.4 Comorbidity and Agreement

Finally, there was no interactive effect of PD and MDD on self-informant agreement for NA, PA or anxiety sensitivity. There are several possible explanations for this lack of effect of comorbidity. First, the present study may not have had adequate power to detect this higher order (PD x MDD) interaction (although there was adequate power to detect the 2-way effects for rank-order agreement and mean-level analyses: power > .85). Second, this may suggest that noticeability of a trait to informants is not influenced by the degree or severity of the internalizing symptoms experienced by the proband. That is, although anxiety

sensitivity could be more salient to informants of those with PD, the co-occurrence of depressive symptoms with PD symptoms may not necessarily enhance this effect. Likewise, the presence of PD symptoms may not improve self-informant agreement on PA for those with comorbid PD and MDD.

5. Conclusions and Implications

As mentioned earlier, there is a growing literature to suggest that self- and informant-reports may each independently contribute to the predictive utility of personality assessment when reports do not entirely converge (Klein, 2003). It may therefore be beneficial to collect self- and informant-reports when agreement is low, and potentially redundant to collect both reports if agreement is high. Being that self-informant agreement for all traits among those with a diagnosis was moderate at best, even when statistically significant, self- and informant-reports were not capturing entirely redundant information. Thus, it may be valuable to obtain informant-reports of personality among those with an anxiety or mood disorder when possible. However, the degree of concordance between self- and informant-reports of personality among those with a diagnosis indicates that it may not be *necessary* to obtain both reports among those with anxiety or depression (i.e., they are not providing entirely disparate information). Given the differential agreement exhibited across groups, this may be a particularly important factor to consider when conducting between-groups research designs in which PA or anxiety sensitivity are used as predictor variables.

It is also important to acknowledge that reliability of ratings does not necessarily indicate validity (Cronbach and Meehl, 1955). Therefore, agreement between self- and informant-reports of personality could indicate that both sources are biased by the psychopathology of the proband. Although some have argued that informant-reports of personality are more objective and reliable than self-reports of personality among those with psychopathology (Funder and West, 2003; Pilgrim and Mann, 1990; Yang, 1999), there is evidence to suggest that informant-reports may also be influenced by current mood and anxiety disorder symptoms of the *proband*. For example, an investigation by Case et al. (2007) found that self- and informant-reports of personality pathology changed after recovery from a depressive episode. Therefore, it may be that neither the self- nor informant-reports are indicative of the proband's premorbid personality.

Finally, factor loadings of specific traits (e.g., neuroticism or extraversion) onto their respective factors (i.e., NA and PA) were all above .71. This strong covariation within PA and NA factors that clinicians may select any of the specific trait measures utilized in the present study if they intend for our agreement results to inform their clinical practice.. However, given that the GTS, EPQ-R, and BIS/BAS each assess negative and positive emotional propensities, these personality measures may be a more efficient means of assessment than the ASI-R or TEPS.

The present study had several limitations worth considering. First, information was not obtained about the relationship of the informant to the proband, the informants' history of psychopathology, or demographic information. Any of the aforementioned factors could have potentially influenced self-informant agreement. Second, as discussed above, a small

sample size in each of the four diagnostic groups may have made it difficult to detect the interactive effect of PD and MDD on self-informant agreement (although not the above PD x anxiety sensitivity or MDD x PA effects). Third, the average time lapsed between the collection of self- and informant-reports varied greatly across participants. We controlled for the number of days spanned in between the administration of self- and informant-reports, and the pattern of results did not change when this covariate [or any of the other covariates] were removed from our models. There was also no main effect of days spanned on self- or informant-reported personality; nor was there an interaction of days spanned x diagnosis on self- or informant-reports of personality (p 's > .11). Fourth, the informant-report measures utilized in the present study have not been previously validated, and therefore may have had different psychometric properties than the self-report measures.

The current investigation had several methodological strengths, such as a clinical sample, a design that allows for an independent examination of anxiety and depression (to conditions which co-occur at extremely high rates), and the lack of reliance on a single indicator of PA and NA (but rather latent factors which would reduce measurement noise [Elliot and Thrash, 2002]).

In conclusion, results from this investigation have important implications for future studies that use personality traits to predict an individual's risk for anxiety and/or depression, or prognosis among those with internalizing psychopathology. Given the differential self-informant agreement across diagnostic groups, future investigations should examine whether the incremental utility of self- and informant-reports of personality also varies by diagnostic group. In particular, studies are needed to evaluate whether the association between an external criterion (e.g., behaviors measured in the laboratory) and self- and informant-reports differs by diagnosis.

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Figure 1.
The moderating effect of major depressive disorder on PA agreement.

Figure 2.
The moderating effect of panic disorder on anxiety sensitivity agreement.

Figure 3.

The moderating effect of panic disorder on mean-level differences between self- and informant-reports of anxiety sensitivity.

* $p < .05$

Table 1

Results of the Principle Component Factor Analysis of the GTS, EPQ, ASI-R, BIS/BAS, and TEPS

	Self-report Factor 1 (NA)	Self-report Factor 2 (PA)
GTS Negative Emotionality	.91	-.22
EPQ Neuroticism	.90	-.22
BIS/BAS Behavioral Inhibition	.79	-.01
ASI-R Anxiety Sensitivity	.80	-.10
TEPS Reward Processing	-.12	.81
BIS/BAS Behavioral Activation	.14	.72
GTS Positive Emotionality	-.41	.79
EPQ Extraversion	-.30	.82
	Informant-report Factor 1 (NA)	Informant-report Factor 2 (PA)
GTS Negative Emotionality	.90	-.11
EPQ Neuroticism	.90	-.17
BIS/BAS Behavioral Inhibition	.71	-.19
ASI-R Anxiety Sensitivity	.75	.00
TEPS Reward Processing	.00	.74
BIS/BAS Behavioral Activation	.03	.87
GTS Positive Emotionality	-.32	.76
EPQ Extraversion	-.27	.73

Note. Factor loadings > .70 are in boldface

Table 2

Hierarchical Linear Regression Analyses Examining Rank-Order Agreement between Self- and Informant-Reports of PA

	β	t	R	R ²
Step 1			.27	.07*
Age	-.17	-1.87		
Gender	.21*	2.35		
Days Spanned	.01	.09		
Step 2			.57	.26*
PA Inf	.28*	3.39		
PD	-.01	-.09		
MDD	-.34*	-3.89		
Step 3			.60	.03
PD X PA Inf	-.18	-1.48		
MDD X PA Inf	.31*	2.24		

Note. PD = panic disorder; MDD = major depressive disorder; PA = positive affectivity;

PA Inf = informant-reported PA; Days spanned = number of days spanned in between the administration of self- and informant-reports.

*
p < .05

Table 3

Hierarchical Linear Regression Analyses Examining Rank-Order Agreement between Self- and Informant-Reports of NA

	β	t	R	R^2
Step 1			.16	.03
Age	.00	.04		
Gender	-.06	-.65		
Days Spanned	.15	1.56		
Step 2			.69	.46*
NA Inf	.35*	4.42		
PD	.30*	3.88		
MDD	.28*	3.50		
Step 3			.70	.01
PD X NA Inf	.09	.76		
MDD X NA Inf	-.14	-1.15		

Note. PD = panic disorder; MDD = major depressive disorder; NA = negative affectivity;

NA Inf = informant-reported NA; Days spanned = number of days spanned in between the administration of self- and informant-reports.

*
 $p < .05$

Table 4

Hierarchical Linear Regression Analyses Examining Rank-Order Agreement between Self- and Informant-Reports of ASI-R

	β	t	R	R ²
Step 1			.27	.07*
Age	.21*	2.26		
Gender	-.10	-1.06		
Days Spanned	.14	1.48		
Step 2			.65	.35*
ASI-R Inf	.26*	3.29		
PD	.41*	5.02		
MDD	.17*	2.07		
Step 3			.68	.05*
PD X ASI-R Inf	.27*	2.12		
MDD X ASI-R Inf	.05	.38		

Note. PD = panic disorder; MDD = major depressive disorder; ASI-R = Anxiety Sensitivity Index-Revised; ASI-R Inf = Informant-reported ASI-R; Days spanned = number of days spanned in between the administration of self- and informant-reports.

* $p < .05$.