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Convergence and Divergence of Grandiose and Vulnerable Narcissism with the Minnesota Multiphasic Personality Inventory-2-Restructured Form

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Abstract

In clinical and empirical literature, there are many different conceptualizations of the construct of narcissism, but most will agree that narcissism includes at least two broad dimensions: grandiosity and vulnerability. The aim of this study was to corroborate both grandiose and vulnerable narcissism constructs by extending the nomologic net of both dimensions. We therefore investigated the convergences and divergences of the Pathological Narcissism Inventory (PNI) dimensions with the Personality Psychopathology Five-revised (PSY-5-r) trait domains and other Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF) scales in a community sample (N= 251). Results showed that there is clear and conceptually logical convergence between the PNI scales and MMPI-2-RF PSY-5-r trait domains and other MMPI-2-RF scales. Also, the narcissism factors diverge like expected in terms of associations with MMPI-2-RF scales capturing internalizing aspects. Internalizing MMPI-2-RF scales showed positive relations with vulnerability and negative relations with grandiosity. Moreover, grandiosity did relate positively MMPI-2-RF externalizing scale.
Key words: MMPI-2-RF, Pathological Narcissism Inventory, grandiose narcissism, vulnerable narcissism, narcissism.

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Novelty and Significance

What is already known about the topic?

- Although the concept of narcissism remains topic of debate, there is a growing consensus that it includes at least two broad dimensions: grandiosity and vulnerability.
- Previous studies using the Minnesota Multiphasic Personality Inventory-2-Restructured Form could identify the existence of the two dimensions and found convergence between selected scales and both narcissism dimensions.

What this paper adds?

- This study extended prior research by using Minnesota Multiphasic Personality Inventory-2-Restructured Form scales to extend the nomological net of the narcissism constructl.
- This study showed that the Minnesota Multiphasic Personality Inventory-2-Restructured Form is a solid psychopathology measure, capable of capturing important variance of both the grandiosity and vulnerability dimensions of narcissism as measured with the Pathological Narcissism Inventory.

Although the conceptualization and assessment of narcissism was recently a topic of debates (Krizan & Herlache, 2017; Miller, Lynam, & Campbell, 2016a, b; Wright & Edershile, 2018), a general consensus is growing that a comprehensive view of narcissism includes at least two broad dimensions: grandiosity and vulnerability (Ackerman, Hands, Donnellan, Hopwood, & Witt, 2017; Cain, Pincus & Ansell, 2008; Fossati, Bauchaine, Grazioli, Carretta, Continovis & Maffei, 2005; Gore & Widiger,

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2016; Miller, Hoffman, Gaughan, Gentile, Maples & Campbell, 2010; Pincus, Ansell, Pimentel, Cain, Wright, & Levy, 2009; Pincus & Lukowitsky, 2010; Soleimani *et alia*, 2022). Narcissistic grandiosity is reflected in maladaptive self-enhancement motivation characterized by an inflated self-view with concomitant aggrandizing fantasies, a sense of entitlement, and interpersonal exploitativeness. Narcissistic vulnerability reflects impaired self, emotion, and behavior regulation in response to self-enhancement failures and lack of recognition and admiration from others, leading to shame, envy, rage, withdrawal, and low self-esteem. Narcissistic grandiosity and vulnerability are important constructs because, beyond personality pathology, they are also associated with a variety of clinically relevant outcomes including depression, aggression, suicidality, and self-injury (e.g., Dawood, Schroeder, Donnellan, & Pincus, 2017; Dowgwillo, Dawood, & Pincus, 2016; Krizan & Johar, 2017; Miller, Widiger, & Campbell, 2010; Pincus, 2023a).

Both dimensions of pathological narcissism are operationalized by the Pathological Narcissism Inventory (PNI; Pincus, 2013, 2023b; Pincus *et alia*, 2009). A large body of laboratory (e.g., Fetterman & Robinson, 2010; Mao *et alia*, 2016), clinical (e.g., Edershile, Simms, & Wright, 2019; Ellison, Levy, Cain, Ansell, & Pincus, 2013; Morf *et alia*, 2017), longitudinal (e.g., Dowgwillo & Pincus, 2023; Roche, Pincus, Conroy, Hyde, & Ram, 2013), and correlational (e.g., Roche, Pincus, Lukowitsky, Ménard, & Conroy, 2013; Wright, Pincus, Thomas, Hopwood, Markon, & Krueger, 2013) research supports the validity of scores on the PNI. One approach investigators have taken to more fully evaluate the nomological net of narcissistic grandiosity and narcissistic vulnerability is to examine their associations with general personality trait models such as the Five-Factor Model (e.g., Miller *et alia*, 2014), the six dimensional HEXACO Model, containing the factors Honesty-Humility (H), Emotionality (E), Extraversion (X), Agreeableness (A), Conscientiousness (C) and Openness to Experience (O) (Bresin & Gordon, 2011), and pathological trait models such as the one found in the Diagnostic and Statistical Manual of Mental Disorders-5-Text Revision (DSM-5-TR; American Psychiatric Association -APA-, 2022) alternative model for personality disorders (e.g., Fossati, Somma, Borroni, Pincus, Markon, & Krueger, 2016).

The DSM-5 alternative model for diagnosis of personality disorders (AMPD) in Section III does include some vulnerable aspects of NPD in Criterion A (Pincus, Dowgwillo, & Greenberg, 2016), which measures impairments in self and interpersonal functioning (e.g., "exaggerated self-appraisal may be inflated or deflated, or vacillating between extremes; emotional regulation mirrors fluctuations in self-esteem", APA, 2022, pp. 767-768). Yet, the trait elevations required for NPD diagnosis in Criterion B remain rather narrow—Grandiosity and Attention-seeking (both from the Antagonism domain). These emphasize grandiosity over vulnerability and no traits were included in Criterion B that specifically assesses vulnerable aspects of NPD (Pincus *et alia*, 2016).

Consequently, a study investigating the relations between the Personality Inventory for DSM-5 (PID-5; Krueger, Derringer, Markon, Watson, & Skodol, 2012) and both dimensions of narcissism as measured by several narcissism instruments (e.g. Narcissistic Personality Inventory, NPI, Raskin & Terry, 1988; Psychological Entitlement Scale, PES, Campbell, Bonacci, Shelton, Exline, & Bushman, 2004; Hypersensitive Narcissism Scale, HSNS, Hendin & Cheek, 1997), Miller, Gentile, Wilson, and Campbell (2013) found that narcissistic grandiosity was more strongly represented by the two proposed DSM-5 AMPD traits of Grandiosity and Attention Seeking than narcissistic vulnerability. Additionally, vulnerability also showed moderate to strong correlations with facets from all PID-5 domains. Similar results were found by Wright *et alia* (2013) in a large undergraduate

population, where the PNI Grandiosity mainly correlated with PID-5 trait Antagonism but also moderately with traits from the Negative Affectivity and Psychoticism domains. The Vulnerable dimension correlated with most PID-5 domains and traits but when all domains were entered into a regression analysis, only Negative Affectivity appeared to be a good predictor and to a lesser degree Antagonism. Fossati *et alia* (2016) extended the study of Wright *et alia* (2013) by looking at convergence and divergence between PID-5 and different NPD measures, including the PNI, in a clinical sample and confirmed most of the results of the previous research. They not only concluded that the traits of the PID-5 could capture pathological narcissism but also that there are distinct differences of the conceptualizations of the construct (Fossati et alia, 2016, Miller *et alia*, 2016b, Wright, 2016). According to Miller *et alia* (2016a) PNI Grandiose narcissism comprises traits that are not essential to the concept of narcissism and therefore measures a much broader construct. They came to this conclusion on the basis of expert ratings; according to experts the PNI Grandiose dimension captured a considerable amount of vulnerability and diverged significantly from the expert predictions of the associations between the Five-Factor Model of personality and NPD. However, using a hierarchical regression approach to re-evaluate the nomological networks for both PNI dimensions, Edershile *et alia* (2019) found that PNI Grandiosity did correspond to the suggested conceptualization of narcissistic grandiosity when controlling for the overlapping variance with narcissistic vulnerability.

In addition to associations between the PNI and PID-5, investigators have also examined the associations between the DSM-5 Section II (APA, 2013) or the former DSM-IV-TR (APA, 2000) NPD diagnosis and the PID-5. Hopwood, Thomas, Markon, Wright, and Krueger (2012) demonstrated that seven other PID-5 facets besides Grandiosity and Attention Seeking correlated at least at .40 or higher with NPD (i.e. Hostility, Manipulativeness, Callousness, Deceitfulness, Suspiciousness, Perseveration and Perceptual Dysregulation). Anderson *et alia* (2013) also found moderate associations between NPD and all Antagonism traits and the Negative Affectivity domain and two of its facets (Hostility and Separation Insecurity). Summarized, these studies also indicate that the currently defined DSM-5 Section III traits do not fully capture the narcissism construct.

Three suggestions for revising the diagnosis of NPD to incorporate features of narcissistic vulnerability have appeared in the literature. One suggestion is to revise the DSM criteria to include features reflecting narcissistic vulnerability (e.g., Ronningstam, 2009). An alternative proposal is to consider narcissistic vulnerability as a specifier for NPD diagnoses (e.g., NPD with vulnerable features) like specifiers used for other diagnoses (Miller, Gentile, Wilson, & Campbell, 2013). A third alternative is to consider pathological narcissism a facet of general personality pathology, representing a core feature of all PDs rather than a specific PD diagnosis (Morey, 2005; Morey & Stagner, 2012). We consider the DSM-5 AMPD NPD diagnosis as a viable approach that is worthy of further study and refinement (Pincus *et alia*, 2016; Skodol, Morey, Bender, & Oldham, 2015). Yet, further research on the nomological nets of both vulnerable and grandiose trait dimensions of narcissism is a prerequisite to build out a firm empirical basis to advocate the inclusion of vulnerable traits in a next DSM revision.

The existence of two underlying dimensions of narcissism was already corroborated by early research with the Minnesota Multiphasic Personality Inventory (MMPI, Hathaway & McKinley, 1943) one of the most widely used self-report instruments for assessing psychopathology (Camara, Nathan, & Puente, 2000). Wink (1991) performed a principal component analysis on six narcissism scales (Ego-Sensitivity subscale,

Pepper & Strong, 1958; Serkownek's Narcissism-Hypersensitivity, Serkownek, 1975; Narcissistic Personality Disorder Scale -NPDS-, Ashby, Lee, & Duke, 1979; Narcissistic Personality Disorder Scale -NPD-, Morey, Waugh, & Blashfield, 1985; Narcissism Scale, Raskin & Novacek, 1989; and Narcissism Scale, Wink & Gough, 1990) which were developed using the original MMPI item pool. His work revealed two separate unipolar factors. The first factor was identified as Vulnerability-Sensitivity and had high loadings of the Ego-Sensitivity subscale, the Narcissism-Hypersensitivity subscale and Narcissistic Personality Disorder Scale (NPDS), correlating strongly with introversion, hypersensitivity, defensiveness, anxiety and vulnerability as measured with conceptually relevant scales of the California Psychological Inventory (CPI; Gough 1957, 1987) and the Adjective Check List (ACL; Goug & Heilbrun, 1983). The remaining three narcissism scales, all of which were based on the DSM-III NPD (APA, 1980), loaded highly on the second factor, Grandiosity-Exhibitionism which was associated with extraversion, aggressiveness and the need for admiration from others. Although each of these six narcissism scales could be allocated to one of the two factors, they also shared core narcissistic characteristics of arrogance, ignoring the needs of others, and self-indulgence. In a study developing an MMPI-2 description of narcissism, Rathvon and Holmstrom (1996) subjected the Narcissistic Personality Inventory (NPI, Raskin & Hall, 1979) and five MMPI derived narcissism scales (Ego-Sensitivity subscale, Pepper & Strong, 1958; Serkownek's Narcissism-Hypersensitivity subscale, Serkownek, 1975; Narcissistic Personality Disorder Scale -NPDS- Ashby, Lee, & Duke, 1979; Narcissistic Personality Disorder Scale -NPD- Morey, Waugh, & Blashfield, 1985; and Narcissism Scale, Wink & Gough, 1990) to a factor analysis. Their findings supported those of Wink (1991), further confirming the distinction between vulnerable and grandiose dimensions of narcissism. Their first factor, Narcissistic Depletion, characterized by vulnerability and depletion, correlated positive with all MMPI-2 clinical scales, of which correlations with scale 2 (D), scale 7 (Pt), scale 8 (Sc) and scale 0 (Si) were the strongest, and with supplementary scales Anxiety (A), Maladjustment (Mt) and Manifest Anxiety (MAS). Negative correlations were found with Ego Strength (Es), Dominance (Do) and Overcontrolled-Hostility (O-H). The second factor Narcissistic Grandiosity, defined by grandiosity and exhibitionism, was positively associated with scale 9 (Ma) and showed negative correlations with all other clinical scales especially with scales 2 (D) and 0 (Si). Both factors were positively correlated with Authority Conflict (AUT) and Manifest Hostility (HOS) and negatively with Repression (R).

The Minnesota Multiphasic Personality Inventory-2- Restructured Form (MMPI-2-RF; Ben-Porath & Tellegen, 2008), contains a set of scales, the Personality Psychopathology Five-revised (PSY-5-r; Harkness & McNulty, 1994), which is conceptually similar to the DSM-5 domains operationalized by the PID-5 (Krueger, McGue, & Iacono, 2001; Anderson *et alia*, 2013). Anderson *et alia* (2013) empirically validated the association between PSY-5-r scales and PID-5 domains and facets. In another study by Sellbom, Anderson, and Bagby (2013) the relation between the remaining MMPI-2-RF scales and PID-5 traits was examined and results showed that there was convergence between both instruments. They also investigated the associations between the MMPI-2-RF scales and the six Personality Disorder types as conceptualized in the DSM-5 Section III, including the Narcissistic Personality Disorder, using multiple regression analysis. Their results demonstrated that NPD correlated strongest with Hypomanic Activation (RC9) and to a lesser extend to the Higher Order Behavioral/Externalizing Dysfunction scale (BXD), Aberrant Experiences (RC8) and Specific Problem Scales -Substance Abuse (SUB),

Aggression (AGG), low Interpersonal Passivity (IPP) and low Social Avoidance (SAV). A substantial amount of the variance (28%) in NPD appeared to be explained. This means that the MMPI-2-RF can make a meaningful contributing in the assessment of personality psychopathology per the DSM-5 Section III AMPD (Sellbom *et alia*, 2013). A similar study by Anderson, Sellbom, Ayearst, Quilty, Chmielewski, and Bagby (2015), investigating convergence between the PID-5 and the MMPI-2-RF in a psychiatric sample supported these findings. Yet to date, no study has investigated whether these PSY-5-r scales and/or other MMPI-2-RF scales can capture both narcissistic grandiosity and narcissistic vulnerability.

The aim of the present study was too further extend the nomological net of narcissistic grandiosity and narcissistic vulnerability. We briefly exam the convergences and divergences of the PNI dimensions with the PSY-5-r trait domains and other MMPI-2-RF scales. Wright *et alia* (2013) reported a significant correlation between PNI Grandiosity and PID-5 Antagonism domains, and Anderson *et alia* (2013, 2015) and Sellbom *et alia* (2013) found significant correlations between PID-5 Antagonism and PSY-5-r Aggressiveness-revised (AGGR-r) and Disconstraint-revised (DISC-r). Given the conceptual similarities between the PSY-5-r and the PID-5 scales we thus expect that grandiose narcissism will have the strongest association with those two PSY-5-r scales.

In the study of Wright *et alia* (2013), PNI Vulnerability correlated with all PID-5 domains but only Negative Affectivity (and on a minor level Antagonism) appeared to be predictive this dimension when examined from a multivariate perspective. We therefore expect an association between Vulnerability and NEGE-r. In line with results of previous narcissism studies using the original MMPI (Rathvon & Holmstrom, 1996; Wink, 1991), we expect that MMPI-2-RF Restructured Clinical scales (RC) and Specific Problem Scales measuring internalizing problems (e.g. Demoralization scale (RCd), Dysfunctional Negative Emotions (RC7), Helplessness/hopelessness (HLP), Self-Doubt (SFD), Inefficacy (NFC), Stress/Worry (STW), Anxiety (AXY), Behavior-Restricting Fears (BRF) and Multiple Specific Fears (MSF)) will correlate significantly with Vulnerability, whereas the externalizing scales (e.g. Hypomanic Activation (RC9), Juvenile Conduct Problems (JCP), Substance Abuse (SUB), Aggression (AGG) and Activation (ACT)) will correlate significantly with Grandiosity.

Finally, we will evaluate if salient MMPI-2-RF scale sets (PSY-5-r, RC- and Specific Problem scales) explain variability in both dimensions of pathological narcissism.

Method

Participants and Procedure

A set of Dutch-language self-report measures, the MMPI-2 (Derksen, de Mey, Sloore & Hellenbosch, 2006) (from which the MMPI-2-RF can be calculated) and PNI (Rossi, De Weerdt, De Page, Hennequin, Derksen, & Pincus, 2012) were administered to non-clinical volunteers who signed an informed consent before taking part in the study. Participants included 263 adults recruited by undergraduate psychology students who received course credits in return. Twelve invalid MMPI-2-RF test protocols were removed from the original dataset based on the exclusion criteria defined in the Dutch and original MMPI-2-RF Manual: Cannot Say scale raw score >18, *Vrin-r* or *Trin-r* scale *T*-score >80, *Fp-r T*score >100 (Van der Heijden, Derksen, Egger, Rossi, Laheij, & Bögels, 2013, p. 37-44). The final community sample consisted of 251 participants (61.8% female) with ages ranging from 18 to 78 (Mean age= 29.86, *SD*= 13.51).

Instruments and Measures

Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF; Ben-Porath & Tellegen, 2008). We administered the Dutch language version of the MMPI-2 (Derksen *et alia*, 2006), and calculated the MMPI-2-RF scores from the MMPI-2 administration booklet. MMPI-2-RF scale scores can easily be derived from the MMPI-2 and used for MMPI-2-RF validation studies (Van der Heijden, Egger, & Derksen, 2010). Numerous studies have supported the construct validity of the Dutch version (e.g., Van der Heijden, Egger, Rossi, Grundel, & Derksen, 2013; Van der Heijden, Egger, Rossi, Van der Veld, & Derksen, 2013; Van der Heijden, Rossi, Van der Veld, Derksen, & Egger, 2013). Results for the internal consistency in our sample were similar to the Dutch normative sample (Van der Heijden *et alia*, 2010). The overall mean internal consistency in our sample was α= .68 (compared to α= .61 in the Dutch normative sample). Our mean internal consistency for the Higher Order factor was α= .77 (range= .65-.86, α= .71 in the Dutch normative sample), RC-scales α= .72 (range= .56-.88, α= .71 in the Dutch normative sample), PSY-5-r scales α= .71 (range= .67–.76, α= .70 in the Dutch normative sample), and for Specific Problems and interest scales α= .63 (range= .27-.80, α= .60 in the Dutch normative sample). For the Internalizing Specific Problem scale Suicide/ Death Ideation (SUI), the internal consistency was very poor (α= .27), yet this scale only contains five items, the variation on the score is limited in a normal population, and also the Standard Error of measurement is still acceptable for this scale (.21). In the Dutch normative sample reliability for SUI was also low (α= .42).

Narcissistic Personality Inventory (NPI, Raskin & Hall, 1979). The Dutch version of the PNI (Rossi *et alia*, 2012), a 52-items self-report instrument with a 6-point response scale ranging from 0= "Not at All Like Me" to 5= "Very Much Like Me", was used to measure both narcissistic grandiosity and narcissistic vulnerability. The PNI contains seven scales; Exploitativeness, Grandiose Fantasy, Self-Sacrificing Self-Enhancement, Contingent Self Esteem, Hiding the Self, Devaluing and Entitlement Rage loading on two correlated higher order domains; Narcissistic Grandiosity and Narcissistic Vulnerability (Wright, Lukowitsky, Pincus, & Conroy, 2010). To date no validity studies have been done on this Dutch language version but the translation was completed according to international guidelines (International Test Commission, 2005). For the current sample the internal consistency of the primary (Mean α= .82; range=.74-.89) and higher order scales (NG α= .88; NV α= .94) was good to very high.

Data Analysis

All analyses were preformed using SPSS Statistics for Windows. Because gender was unequally distributed in our dataset (62% women) differences between group means for PNI and PID-5 scales were tested with *t* tests and effect sizes of significant differences reported. Cohen's d was used as a measure of effect size (Cohen, 1992), with $d \geq .10$ indicating a small effect, $d \geq .30$ a medium effect, and $d \geq .50$ a large effect. All analyses in our study controlled for gender when differences were found. To explore the relationship between PNI and PSY-5-r scales, we used partial correlations, controlling for gender. Next, the convergence and divergence of grandiose and vulnerable narcissism with the MMPI-2-RF was explored by correlating all MMPI-2-RF scales with the two PNI dimensions and scales. To investigate the associations between the PSY-5-r, the RC, and Specific Problem scales towards both narcissism dimensions, a series of hierarchical regression analyses was performed. Because all analyses were controlled for gender, this variable was entered as block 1. Since previous research (e.g., Miller *et alia*, 2014) showed that PNI Narcissistic Grandiosity and Narcissistic Vulnerability are positive correlated (e.g., Miller *et alia*, 2014; Wright *et alia*, 2010), the PNI Narcissistic Grandiosity scale or PNI Narcissistic Vulnerability scale was entered in the second block, depending on whether the dependent variable was Narcissistic Grandiosity or Vulnerability. In the third block

the PSY-5-r scales, RC- or Specific Problem scales were entered. Finally, to examine the incremental validity of the PNI narcissistic dimensions above the PSY-5-r, RC- and Specific Problem scales, we reversed the order of the blocks 2 and 3.

Results

Significant differences in mean scores were found for the PNI scales Exploitativeness (EXP), Grandiose Fantasy (GF), and the higher order domain Narcissistic Grandiosity, indicating men scored significantly higher on those scales. With a medium effect size for Exploitativeness (*d*= .55) and small effect sizes for Grandiose Fantasy and Narcissistic Grandiosity (*d*= .43 and .47). Complete results are available in the electronic supplement.

The association between the PNI scales and the PSY-5-r scales was investigated using partial correlations, controlling for gender (Table 1). PNI Grandiosity correlated strongly with AGGR-r, Psychoticism-revised (PSYC-r), and DISC-r and the vulnerable dimension was strongly associated with Negative Emotionality/Neuroticism-revised (NEGE-r). At the level of the primary scales, EXP correlated with two PSY-5-r scales, AGGR-r and DISC-r, while GF was most strongly associated with PSYC-r. Results

Table 1: Partial correlations between PSY-5-r scales and PNI scales and higher order domains (*N*= 251).

	AGGR-r	PSYC-r	DISC-r	NEGE-r	INTR-r
CSE	-.02	.23**	.13*	**.45****	-.05
HS	-.00	.14*	.07	**.33****	.16*
DEV	.16*	.26**	.20**	**.34****	.01
ER	.29**	.21**	.19**	**.34****	-.09
EXP	**.43****	.21**	**.37****	.04	-.27**
SSSE	.16*	.17**	.10	.29**	-.16*
GF	.16*	**.33****	.23**	.28**	-.10
VULN	.13*	.25**	.18**	**.44****	.01
GRAN	**.31****	**.31****	**.30****	.26**	-.22**
Total	.24**	**.30****	.26**	**.38****	-.11

Notes: Medium or large effect sizes are indicated in bold; AGGR-r= Aggressiveness-revised; CSE= Contingent Self-Esteem; DISC-r= Disconstraint-revised; DEV= Devaluing; ER= Entitlement Rage; EXP= Exploitativeness; GF= Grandiose Fantasy; GRAN= Narcissistic Grandiosity; HS= Hiding the Self; INTR= Introversion/Low Positive Emotionality-revised; NEGE-r= Negative Emotionality/Neuroticism-revised; PNI= Pathological Narcissism Inventory; PSY-5-r= Personality Psychopathology 5- revised; PSYC-r= Psychoticism-revised; SSSE= Self-Sacrificing Self-Enhancement; VULN= Narcissistic Vulnerability; **= p <.01; *= p < .05.

for the vulnerable subscales were similar to those found on the higher order level and showed moderate correlations with NEGE-r. The PSY-5-r Introversion/Low Positive Emotionality-revised (INTR-r) scale did not correlate well with any of the PNI scales or domains.

Pearson product moment correlations were also calculated to evaluate the divergent and convergent relations between the other MMPI-2-RF scales and the two PNI dimensions (see Table 2). Grandiosity was more strongly correlated with scales assessing Externalizing problems while vulnerability was more strongly associated with the Internalizing scales. This was very clear for the Higher Order scales where Vulnerability correlated positively with Emotional/internalizing Dysfunction (EID) and Grandiosity with Behavioral/Externalizing Dysfunctions (BXD). Vulnerability correlated

most highly with RC7, RCd, and Ideas of Persecution (RC6) while Grandiosity exhibited its highest associations with RC9 and Antisocial Behavior (RC4). Of all the Specific Problem Scales, only the Externalizing scale; ACT and the Interpersonal problem scale; Family problems (FML) showed meaningful associations with Grandiosity. Vulnerability on the other hand, correlated with Malaise (MLS) and Cognitive Complaints (COG), as well as 5 Internalizing Specific Problem Scales Helplessness/Hopelessness (HLP), Self-doubt (SFD), Inefficacy (NFC), Stress/Worry (STW) and Anxiety (AXY). The Externalizing Specific Problem Scale Aggression (AGG) and the Interpersonal Specific Problem scale, Family Problems (FML), correlated equally with both Vulnerability and Grandiosity. Thought Dysfunction (THD) and RC6 correlated with PNI Grandiosity, RC9 showed, besides a strong association with PNI grandiosity, also a moderate association with vulnerability.

Table 2: Pearson correlations between the MMPI-2-RF scales (Higher Order scales, RC- and Specific Problem Scales) and the two dimensions of PNI, Grandiose Narcissism and Vulnerable Narcissism (*N*= 251).

	MMPI-2-RF scales	PNI Grandiosity	PNI Vulnerability
Higher Order Factors	Emotional/Internalizing Dysfunction (EID)	.14*	**.46****
	Thought Dysfunction (THD)	**.30****	.26**
	Behavioral/Externalizing Dysfunction (BXD)	**.31****	.23**
RC-Scales	Demoralization (RCd)	.19**	**.46****
	Somatic Complaints (RC1)	.12*	.22**
	Low Positive Emotions (RC2)	-.07	.20**
	Cynism (RC3)	.17**	.29**
	Antisocial Behavior (RC4)	**.31****	.28**
	Ideas of Persecution (RC6)	**.32****	**.37****
	Dysfunctional Negative Emotions (RC7)	**.30****	**.52****
	Aberrant Experiences (RC8)	.26**	.21**
	Hypomanic Activation (RC9)	**.46****	**.38**
Specific Problem Scales (Somatic Cognitive scales)	Malaise (MLS)	.15*	**.32****
	Gastrointestinal Complaints (GIC)	.07	.10
	Head Pain Complaints (HPC)	.06	.14*
	Neurological Complaints (NUC)	.12	.21**
	Cognitive Complaints (COG)	.26**	**.35****
Specific Problem Scales (Internalizing Scales)	Suicidal/Death Ideation (SUI)	.08	.18**
	Helplessness/Hopelessness (HLP)	.10	**.35****
	Self-Doubt (SFD)	.07	**.37****
	Inefficacy (NFC)	.25**	**.40****
	Stress/Worry (STW)	.22**	**.38****
	Anxiety (AXY)	.20**	**.31****
	Anger Proneness (ANP)	.22**	.29**
	Behavior-Restricting Fears (BRF)	.02	.15*
	Multiple Specific Fears (MSF)	.05	.16*
Specific Problem Scales (Externalizing Scales)	Juvenile Conduct Problems (JCP)	.22**	.18**
	Substance Abuse (SUB)	.24**	.15*
	Aggression (AGG)	.29**	**.30****
	Activation (ACT)	**.34****	.28**
Specific Problem Scales (Interpersonal Problems)	Familiy Problems (FML)	**.32****	**.37****
	Interpersonal Passivity (IPP)	-.28**	-.09*
	Social Avoidance (SAV)	-.13*	.11
	Shyness (SHY)	-.03	.23**
	Disaffiliativeness (DSF)	.05	.18**

Notes: Medium (≥.30) or large effect sizes are indicated in bold; **= p <.01; *= p < .05.

Results of a series of hierarchical regression analyses (Tables 3, 4, and 5) showed that while a majority of the variance is consistently explained by the other narcissism dimension, MMPI-2-RF scales demonstrated contributed significantly to prediction above and beyond the narcissism dimension. These results remained the same when the order of the blocks was changed, i.e. when the Grandiose or Vulnerable scores, were put into the last block. Gender contributed to the association of both factors, i.e. positively associated with vulnerability and negatively associated Grandiosity. The PSY-5-r scale INTR-r appeared to be a significant predictor for both dimensions, positive for vulnerability, negative for Grandiosity. The same result was found for the two RC-scales, RCd and Cynicism (RC3) and for the internalizing specific problem scales: HLP

Table 3: Hierarchical regression analyses of the two PNI dimensions and PSY-5-r scales with the significant predictors for each block (*N*= 251).

		Adjusted R^2	ΔR^2	β	*p*
PNI Grandiosity	Block 1: Gender	.05	.05	-.15	.002
	Block 2: PNI VN	.53	.48	.69	<.001
	Block 3: PSY-5-r	.60	.07		
	AGGR-r			.13	.013
	INTR-r			-.15	.000
	Block 2: PSY-5-r	.22	.19		
	Block 3: PNI-VN	.60	.37	.69	.000
PNI Vulnerability	Block 1: Gender	-.00	.00	.13	.009
	Block 2: PNI GN	.50	.51	.72	.000
	Block 3: PSY-5-r	.59	.09		
	NEGE-r			.27	.000
	INTR-r			.13	.004
	Block 2: PSY-5-r	.19	.21		
	Block 3: PNI-GN	.59	.39	.72	.000

Notes: R^2= coefficient of determination; AGGR-r= Aggressiveness-revised; INTR Introversion/Low Positive Emotionality-revised; NEGE-r= Negative Emotionality/Neuroticisn revised; PNI GN= Grandiose Narcissism; PNI VN= Vulnerable Narcissism; PSY-5-r Personality Psychopathology 5- revised.

Table 4: Hierarchical regression analyses of the two PNI dimensions and RC-scales with the significant predictors for each block (*N*= 251).

		Adjusted R^2	ΔR^2	β	*p*
PNI Grandiosity	Block 1: Gender	.05	.05	-.15	.002
	Block 2: PNI VN	.53	.48	.73	<.001
	Block 3: RC-scales	.61	.09		
	RCd			-.14	.032
	RC3			-.13	.007
	RC9			.22	.001
	Block 2: RC-scales	.25	.23		
	Block 3: PNI-VN	.61	.35	.73	.000
PNI Vulnerability	Block 1: Gender	-.00	.00	.13	.009
	Block 2: PNI GN	.50	.51	.65	.000
	Block 3: RC-scales	.65	.16		
	RCd			.20	.001
	RC3			.12	.007
	RC7			.19	.001
	RC8			-.11	.020
	Block 2: RC-scales	.33	.36		
	Block 3: PNI-GN	.65	.31	.65	.000

Notes: R^2= coefficient of determination; PNI GN= Grandiose Narcissism; PNI VN= Vulnerable Narcissism; PSY-5-r= Personality Psychopathology 5- revised; RCd= demoralization; RC3= Cynisme, RC6= Ideas of persecution; RC7= Dysfunctional Negative Emotions; RC8= Aberrant Experiences; RC9= Hypomanic Activations.

Table 5: Hierarchical regression analyses of the two PNI dimensions and SP-scales with the significant predictors for each block (*N*= 251).

		Adjusted R^2	ΔR^2	β	*p*
	Block 1: Gender	.05	.05	-.19	
	Block 2: PNI VN	.53	.48	.73	.000
	Block 3: SP-scales	.63	.14		.000
	NUC			-.10	.048
PNI Grandiosity	HLP			-.13	.015
	SFD			-.19	.001
	ACT			.12	.023
	Block 2: SP-scales	.26	.28		
	Block 3: PNI-VN	.63	.34	.73	.000
	Block 1: Gender	-.00	.00	.14	.004
	Block 2: PNI GN	.50	.51	.70	.000
	Block 3: SP-scales	.65	.18		
	GIC			-.11	.026
PNI Vulnerability	HLP			.14	.005
	SFD			.20	.000
	MSF			.11	.031
	Block 2: SP-scales	.29	.36		
	Block 3: PNI-GN	.65	.33	.70	.000

Notes: R^2= coefficient of determination; ACT= Activation GIC= Gastrointestinal Complaints; HLP= Helplessness/Hopelessness; MSF= Multiple Specific Fears; NUC= Neurological Complaints; PNI GN= Grandiose Narcissism; PNI VN= Vulnerable Narcissism; SFD= Self-doubt.

and SFD. Grandiosity was also positively predicted by AGGR-r, RC9 and ACT and negatively predicted by NUC. Additional positive predictors for vulnerability appeared to be NEGE-r, RC7, Multiple Specific Fears (MSF) and both RC8 and Gastrointestinal Complaints (GIC) were negatively associated.

Discussion

The goal of the present study was to explore the convergence and divergence of the PNI scales with the PSY-5-r trait domains and other MMPI-2-RF scales. The differences in mean scores between men and women found here for the PNI scales were similar to findings of previous research showing that men scored significantly higher on Exploitativeness, Grandiose Fantasy, and Narcissistic Grandiosity (Pincus *et alia*, 2009; Wright *et alia*, 2010). Our results are also consistent with the finding that DSM-IV/5 NPD is more prevalent in men than women (Stinson *et alia*, 2008).

Based on previous findings where PID-5 domain Antagonism strongly correlated with the PNI Grandiosity (Wright *et alia*, 2013) and subsequently the convergence between Antagonism and Aggressiveness-revised and Disconstraint-revised (Anderson *et alia*, 2013), we expected that grandiose narcissism would have had the strongest association with both of these PSY-5-r scales. This was indeed the case, yet our results clearly showed that Grandiosity also equally correlated with Psychoticism-revised. This can be explained by looking at the primary scales of both PNI dimensions. We found for the scales comprising the Grandiosity dimension that Exploitativeness was clearly associated with both Aggression-revised and Disconstraint-revised. Most authors agree that Exploitativeness is the one scale that aligns best with expert ratings of NPD (Wright, 2016; Miller *et alia*, 2016b). However, according to Miller and his colleagues (2016b), the strength of the Grandiose dimension is diminished because besides Exploitativeness this factor also consists of Grandiose Fantasy and Self-Sacrificing Self-Enhancement. Our results showed that Grandiose Fantasy was captured by the Psychoticism-revised scale.

This is in line with findings of a number of previous studies where significant positive correlations between PNI dimensions and PID-5 Psychoticism traits were found (Fossati *et alia*, 2016, Wright *et alia*, 2013). The subscale Self-Sacrificing Self-Enhancement did not correlate well with any of the PSY-5-r scales, which corroborated the results of Wright *et alia* (2013, 2016). This scale has a very specific content and measures whether one uses supposedly altruistic actions to support an inflated self-image. But a high score on this scale does not necessary entail that one would also have high scores on antagonism or dominance. It is possible this scale is more likely to be negatively associated with Honesty-Humility from the HEXACO model of personality (Bresin & Gordon, 2011; Fossati, Pincus, Borroni, Farrari Munteanu, Maffei, 2014). Overall we can conclude that the PNI Grandiosity factor includes more than just Antagonism or the overt aspects of narcissism that DSM NPD tends to focus on (Ackerman *et alia*, 2017; Pincus, 2013; Wright, 2016).

Vulnerability showed a clear and strong relation with Negative Emotionality/ Neuroticism-revised which is comparable to the study of Wright and colleagues (2013), where the PID-5 factor Negative Affectivity not only showed a strong correlation with PNI Vulnerability but also turned out to be the best predictor for this dimension. The question remains however, whether narcissistic vulnerability was measured here or whether a more general pathological vulnerability consistent with other personality disorders like e.g. borderline, dependent personality, etc. was captured (e.g., Morey, 2005, Morey & Stagner, 2012). Previous studies already suggested that narcissistic vulnerability contains a certain degree of neuroticism and negative emotionality, which is also found in many personality disorders (Miller *et alia*, 2013; Miller *et alia*, 2014; Miller *et alia*, 2016a; Samuel & Widiger, 2008).

In general, the expected convergences between the remaining MMPI-2-RF scales measuring internalizing problems (e.g. Emotional/Internalizing Dysfunction, Demoralization, Dysfunctional Negative Emotions, Helplessness, Self-doubt, Inefficacy, Stress/worry, Anxiety) and narcissistic vulnerability, and between externalizing MMPI-2-RF scales (e.g. Behavioral/Externalizing Dysfunction, Antisocial Behavior, Hypomanic Activation, Activation) and narcissistic grandiosity were clearly found. The MMPI-2-RF scales Thought Dysfunctions and Ideas of Persecutions appeared to be correlated with PNI Grandiosity, which corresponds to the correlation we found earlier between this dimension and Psychoticism-revised and again confirms previous results of Fossati *et alia* (2016) and Wright *et alia* (2013). These findings demonstrate that, like its predecessors, the MMPI-2-RF scales can capture both narcissism dimensions (at least as conceptualized by the PNI).

Finally, we estimated a series of regression analyses to investigate the predictive validity of MMPI-2-RF scales towards the two PNI dimensions. Although both capture a significant amount of variance of narcissism, the two narcissism factors remained the best predictors for each other. These findings were not surprising seeing that both dimensions were constructed to correlate with each other because they share an antagonistic core. Furthermore, this corroborates previous research, where results showed that narcissistic grandiosity of the PNI also captures aspects of vulnerability and vice versa (e.g. Krizan & Johar, 2012; Miller *et alia*, 2014). Although PSY-5 Introversion-revised showed no meaningful bivariate correlation with any of the PNI dimensions or subscales, in regression analyses this PSY-5-r scale contributed to the prediction of both dimensions, positively for Vulnerability and negatively for Grandiosity.

As previously mentioned, in our correlational analyses Negative Emotionality/Neuroticism-revised showed a strong relationship with narcissistic Vulnerability and all corresponding subscales. Given the fact that they both share some content like e.g. experiencing a range of negative emotions and based on previous findings of Wright *et alia* (2013), it was no surprise that Negative Emotionality/Neuroticism also turned out to be a good predictor for PNI Vulnerability. The same results were found for Dysfunctional Negative Emotions, Helplessness/Hopelessness and Self-doubt which not only correlated strongly with Vulnerability but also turned out to be robust predictors. Agressiveness-revised and Hypomanic Activation were both predictive for Grandiosity which was similar to the results of Sellbom and Colleagues (2013) who also found those two scales to be associated with NPD. Furthermore, Grandiosity was also positively predicted by one Externalizing Specific Problem scale, Activation. In line with results of the regression analyses with PSY-5-r and RC-scales, we again found that Grandiosity was predicted negatively by some internalizing Specific Problem scales; Helplessness/Hopelessness and Self-doubt, and the Somatic Cognitive Specific Complaints scale Neurological complaints.

To conclude, previous studies using the MMPI already established the existence of two underlying dimensions of narcissism (Cain *et alia*, 2008; Pincus & Roche, 2011) and research using the MMPI and MMPI-2 found convergence between selected scales and these two dimensions of narcissism (Rathvon & Holmstrom, 1996; Wink, 1991). Our study extended prior research to the MMPI-2-RF scales. Our findings suggest that the MMPI-2-RF is a solid psychopathology measure, capable of capturing important variance of both dimensions of narcissism as measured with the PNI. Moreover, the narcissism factors clearly diverged in terms of MMPI-2-RF scales capturing internalizing aspects, by showing positive relations with Vulnerability and negative with Grandiosity corroborating findings of the existence of two higher order dimensions along the lines of externalization and internalization (Krueger *et alia*, 2001).

Finally, some study limitations should be mentioned. First, our sample was a community 'convenience' sample, so results can certainly not be generalized to clinical or forensic populations where prevalence of narcissism, and other personality disorders is higher. In such clinical samples the content of Vulnerability dimension could be further explored in terms of its specificity to narcissism relative to a more general pathological vulnerability common to several personality disorders. Secondly it would also have been beneficial to use additional narcissism inventories such as the Narcissistic Personality Inventory (NPI; Raskin & Terry, 1988) or the Five-Factor Narcissism Inventory (FFNI; Glover, Miller, Lynam, Crego, & Widiger, 2012). Although the NPI is typically used to assess normal narcissism and is viewed as not very useful for capturing both dimensions of pathological narcissism (Roche, Pincus, Lukowitsky, Ménard, & Conroy, 2013), it has proven to be robust in measuring grandiose narcissism in several studies (Hopwood *et alia*, 2012). The FFNI has scales that aggregate into both narcissistic grandiosity and vulnerability. Thirdly, the measures we used were all self-report which comes with a number of disadvantages: besides the fact that people don't always have a clear picture of themselves, there are problems with over- and underreporting especially when it concerns their personality (Paulhus & Vazire, 2007). More specifically when measuring narcissism people exhibiting vulnerable characteristics appear to have a more defensive response style and are more likely to underreport (Sleep, Sellbom, Campbell, & Miller, 2017). We tried to minimize this problem by including the MMPI-2-RF, an instrument containing validity scales that are extensively researched (Sellbom & Bagby, 2008, 2010).

The current study used the MMPI-2-RF scales, given the recently launched MMPI-3 is not yet available in Dutch (and cannot be estimated from the MMPI-2 or MMPI-2 RF). The MMPI-3 contains a Self-Importance scale (SFI), thus can provide additional information on the convergence and divergence of the instrument with narcissism. On the other hand, this scale is limited by capturing only grandiose and not vulnerable aspects (Sellbom, 2021).

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