Pathological Narcissism and Interpersonal Behavior in Daily Life

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Abstract

The Cognitive-Affective Processing System (CAPS) has been proposed as a useful meta-framework for integrating contextual differences in situations with individual differences in personality pathology. In this article, we evaluated the potential of combining the CAPS meta-framework and contemporary interpersonal theory to investigate how individual differences in pathological narcissism influenced interpersonal functioning in daily life. University students (N = 184) completed event-contingent reports about interpersonal interactions across a 7-day diary study. Using multilevel regression models, we found that combinations of narcissistic expression (grandiosity, vulnerability) were associated with different interpersonal behavior patterns reflective of interpersonal dysfunction. These results are among the first to empirically demonstrate the usefulness of the CAPS model to conceptualize personality pathology through the patterning of *if-then* interpersonal processes.

The *Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition* (DSM-5; Skodol, 2012) defines personality pathology in terms of significant impairments in self and interpersonal functioning that are relatively stable across time and consistent across situations. Yet individuals are inherently embedded within a context (Mischel & Shoda, 2010), and that context may be important in determining how personality pathology manifests (Eaton, South, & Krueger, 2009; Rhadigan & Huprich, 2012). Theory and research aimed at understanding how individual differences in stable traits and contextual differences in situations concurrently contribute to personality stability and behavioral variability has increased (Fleeson & Noftle, 2008; Fournier, Moskowitz, & Zuroff, 2008). This integrative effort also extends to personality pathology, as Eaton and colleagues (2009) articulated how a meta-framework such as the Cognitive-Affective Processing System (CAPS; Mischel, 1973; Mischel & Shoda, 2008; Shoda, Mischel, & Wright, 1994) could be employed to understand the stable and dynamic characteristics of personality pathology. In this article, we operationalize the CAPS framework using contemporary interpersonal theory, and investigate how contextual differences in social situations and individual differences in personality pathology contribute to interpersonal functioning in daily life.

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CAPS Framework and Personality Pathology

The CAPS framework suggests that personality manifests as a complex system of situational inputs and behavioral outputs that are shaped and guided by an individual's cognitive-affective units (CAUs). These CAUs include an individual's unique motives, emotions, memories and expectancies. Individual differences in the organization and chronic accessibility of these CAUs give rise to a stable pattern of situation-behavior contingencies, known as "*if-then*" behavioral signatures (Mischel & Shoda, 2008; Smith, Shoda, Cumming, & Smoll, 2009). This framework adds to other "*if-then*" behavioral models which are concerned with predicting the conditional probability of behavior when presented with a contextual cue (Wright, Zakriski, & Drinkwater, 1999) by emphasizing how CAUs may organize one's experience, giving rise to unique "*if-then*" patterns of behavior. In psychopathology, the chronic accessibility of maladaptive CAUs may lead an individual to distort how they perceive a situation, overemphasize certain aspects of a situation, or fail to differentiate between situations, all of which may lead to maladaptive responses (Eaton et al., 2009; Kammrath, 2011). While the CAPS framework is a useful template to broadly organize situational inputs, CAUs, and behavioral outputs, it lacks specificity in determining how to conceptualize the salient aspects of situational inputs and behavioral outputs (Fournier et al., 2008). A psychological theory is needed to define what specific situations and behaviors are important in understanding personality pathology.

Contemporary Interpersonal Theory

Contemporary interpersonal theory (Pincus & Ansell, 2012; Fournier, Moskowitz, & Zuroff, 2010) can operationalize the CAPS model by defining the salient situational inputs, CAUs, and behavior outputs as interpersonal phenomena (see also Luyten & Blatt, 2011). This perspective is particularly well suited to examine personality pathology given the prominence of interpersonal dysfunction in describing personality disorder in the upcoming DSM (Morey et al., 2011; Pincus, 2011; Pincus & Hopwood, 2012). Contemporary interpersonal theory organizes interpersonal experiences into the broad domains of agency and communion (Bakan, 1966; Wiggins, 2003). *Agency* encompasses strivings for mastery, assertion, and dominance, while *communion* encompasses connectedness, friendliness, and sharing with others. These dimensions are conceptually orthogonal, and form a two-dimensional superordinate structure to organize overt and covert interpersonal experiences, including interpersonal motives, traits, and behaviors. Thus, the dimensions of agency and communion apply equally well to observable behaviors (e.g. input, output) and internal processes (e.g. CAUs) that are interpersonal in nature.

Contemporary interpersonal theory also describes principles that govern the patterning of agentic and communal interpersonal exchanges (Pincus & Ansell, 2012). Perceiving high levels of agency in another (*if*) invites a person to respond with less agency (*then*), forming the principle of *reciprocity*. Perceiving high or low levels of communion in another (*if*) invites a person to respond in kind (*then*), forming the principle of *correspondence* (Carson, 1969; Kiesler, 1983). Naturalistic longitudinal diary studies have generally confirmed this patterning of reciprocity and correspondence in naturally occurring social interactions (Fournier et al., 2008; Moskowitz, Ringo Ho, and Turcotte-Tremblay, 2007). Chronic

deviations from these patterns may be indicative of psychopathology (Pincus, Lukowitsky, Wright, & Eichler, 2009), leading to maladaptive transaction cycles (Kiesler, 1991), self-fulfilling prophecies (Carson, 1982), and/or vicious circles (Millon, 1996). Thus, contemporary interpersonal theory not only provides a cohesive operationalization of the CAPS model (agency and communion as the salient situational and behavioral features), it also articulates how naturalistic social interactions are structured, and hypothesizes that deviations from these expected patterns may be indicative of interpersonal dysfunction. This paper demonstrates how the interpersonally articulated CAPS model can be applied to personality pathology, focusing on pathological narcissism as an exemplar.

Pathological Narcissism and Interpersonal Dysfunction

Pathological narcissism is driven by an intense need for admiration and recognition, combined with a difficulty regulating these needs. It can present in expressions of grandiosity, described as a maladaptive and overriding orientation toward self-enhancement (Morf, Torchetti, & Schürch, 2011; Pincus, in press). It can also present in expressions of vulnerability, characterized by social withdrawal and emotional dysregulation following the painful disappointment of entitled expectations and self-enhancement failures (Cain, Pincus, & Ansell, 2008; Pincus, in press; Pincus & Roche, 2011).

Narcissistic grandiosity is commonly associated with agentic behaviors (*thens*) such as interpersonal dominance (Bradlee & Emmons, 1992; Wiggins & Pincus, 1989) and antagonism (Samuel & Widiger, 2008; Miller et al., 2011), and the Agency Model of Narcissism suggests an emphasis on agentic over communal goals (Emmons, 1989; Foster & Brennan, 2011). A naturalistic audio recording study confirmed that grandiosity was associated with more extraverted and disagreeable acts in daily life (Holtzman, Vazire, & Mehl, 2010). In a naturalistic diary study, grandiosity was associated with a greater sensitivity towards perceiving interpersonal transgressions (*ifs*) (McCullough, Emmons, Kilpatrick, & Mooney, 2003), and several experimental studies demonstrate that threats to agentic motives (*ifs*) evoke dominant responses (*thens*) such as aggression in grandiose individuals (Besser & Priel, 2010; Besser & Ziegler-Hill, 2010; Bushman & Baumeister, 1998; Webster, Kirkpatrick, Nelzek, & Smith, 2007). Consistent with these results, narcissistic grandiosity is also associated with elevated interpersonal sensitivities to control and antagonism from others (Hopwood et al., 2011). As narcissistic grandiosity conveys a particular sensitivity to agentic themes, we hypothesized that for individuals high in grandiosity, perceiving agency in another (*if*) will evoke an underlying status threat catalyzing an interpersonal motivation to self-enhance and re-assert control (*CAU*) leading to an agentic behavioral response (*then*). This pattern deviates from the expectations of reciprocity (e.g. meeting increased agentic perception with decreased agentic behavior = reciprocity) and may be indicative of a maladaptive response (Eaton et al., 2009; Pincus et al., 2009).

The dynamic self-regulatory processing model (Morf & Rhodewalt, 2001) explicitly ties the CAPS framework to narcissism in suggesting that narcissists strive to limit experiences of vulnerability by using interpersonal relationships as instruments of their self-enhancement. When these needs are not met (*if*), the narcissist is wounded, and this vulnerability is

expressed through aggression or disengaged submission (*thens*). Aggression is reflected in the empirical associations between narcissistic vulnerability and antagonism, and narcissistic vulnerability is associated with a host of interpersonal problems that span aggressive (high agency, low communion) and submissive problems (Miller et al., 2011; Pincus et al., 2009). In a series of daily diary studies Rhodewalt and colleagues demonstrated narcissist's self-esteem was more reactive to the quality of their social interactions (Rhodewalt, Madrian, & Cheney, 1998; Rhodewalt, Tragakis, & Hunh, 2006), and narcissists react with anger and devaluation of others where their needs are not met or they experience interpersonal rejection (Besser & Priel, 2010; Kernis & Sun, 1994). Furthermore, narcissistic vulnerability is also associated with elevated interpersonal sensitivities to both antagonism and affection from others (Hopwood et al., 2011). As narcissistic vulnerability conveys sensitivities to both agentic and communal themes, we hypothesized that for individuals high in vulnerability, perceiving increased agency and/or decreased communion in another (*if*) will evoke an underlying interpersonal rejection sensitivity (*CAU*), resulting in submissive and unfriendly behavior (*then*). This pattern enhances the expectations of reciprocity, yet this complementary pattern may derive from an internally deflated self accompanied by feelings of shame, rather than a genuine effort to complement the other, and thus may also represent a maladaptive response (e.g. Eaton et al., 2009).

When equally high levels of grandiosity and vulnerability exist, we anticipate both CAUs of status threat and rejection sensitivity could become prominent, and may result in inconsistent if-then interpersonal patterns. Therefore we are interested in examining the combination of both grandiosity and vulnerability together, but make no specific hypotheses about the patterning of interpersonal associations. In sum, we predict narcissistic grandiosity and vulnerability will be associated with distinct interpersonal behavior patterns, highlighting the utility of interpersonal theory to operationalize the CAPS model and testing the viability of daily diary studies to investigate how personality pathology manifests in daily life (Eaton et al., 2009).

Method

We applied multilevel models to event-contingent social interaction data from the Achievement Motivation and Interpersonal Behavior (AMIB) Study. Comprehensive information about the larger study is reported elsewhere (Ram, Conroy, Pincus, Hyde, & Molloy, 2012).

Participants & Procedures

Participants (for this analysis) were 184 (66% female) undergraduate students who participated in a 7-day dairy study for course credit. They were between 18 and 54 years of age (Median$_{Age}$ = 19, M$_{Age}$ = 19.3, SD$_{Age}$ = 2.8) and primarily in their first (61%) or second (25%) year of college. The majority indicated they were Caucasian (83%). This sample can be considered representative of the emerging adult population at a typical university and does not preclude presence of notable personality pathology (Wright, Pincus, & Lenzenweger, 2011).

Participants attended a 1.5 hour session where study procedures were introduced and baseline measures were collected via a web survey. The participants were given paper diary forms (8 for each day), and asked to complete a form for each face-to-face interaction lasting five minutes or more (event-contingent recording) over 7 days. At the conclusion of the training, participants completed a sample interaction report. Completed diaries were returned to the laboratory each day. In total, participants reported on 7,568 social interactions, with each participant providing between 10 and 56 interactions (median= 43, Mean= 41.1, SD= 13.62). Approximately 90% of the sample provided data on 20 or more interactions.

Measures

Interpersonal Behavior—Consistent with prior daily diary studies investigating interpersonal behavior (e.g., Moskowitz, 2009) we used the Social Behavior Inventory (SBI; Moskowitz, 1994) to assess participants' own agentic behavior and communal behavior. The SBI includes a rotating subset of 46 items, divided into four 12-item parallel forms. Each form contains 3 behavioral items per behavior domain (dominance, submission, warmth, and coldness). Following SBI scoring procedures (Moskowitz, 1994), we calculated the proportion of behavior items endorsed for each behavior domain, yielding 4 behavior scores ranging from 0 (i.e., 0 of 3 items endorsed from that behavior domain) to 1 (i.e., 3 of 3 items endorsed from that behavior domain). We then ipsatized each score by subtracting the average number of items endorsed in that interaction from each score. As has been done elsewhere (see Moskowitz et al., 2007) *behavioral agency* scores were calculated by subtracting the submissiveness score from the dominance score and *behavioral communion* scores were calculated by subtracting the cold score from the warm score. This scoring procedure was chosen to maintain a conceptual symmetry with the two interpersonal perception dimensions, and because opposing behavior scores (dominance versus submissiveness, warmth versus coldness) were moderately negatively related (r= −.43, *p*<.01 for both). Behavior scores were multiplied by 100 to facilitate interpretability (see Fournier et al., 2008).

Interpersonal Perception—After each interaction participants indicated their perceptions of their partners' *agency* and *communion* using the Interpersonal Grid (Moskowitz & Zuroff, 2005). Participants were presented with a 9×9 grid that represented agency along the vertical axis, and communion along the horizontal axis. Participants marked the cell corresponding to a level on the agentic axis −4 (unassured-submissive) to 4 (assured-dominant) and communal axis −4 (cold-quarrelsome) to 4 (warm-agreeable). Higher scores indicated greater perceived agency (assured-dominant) and communion (warm-agreeable).

Pathological Narcissism—Participants level of *narcissistic grandiosity* and *narcisssitc vulnerability* were assessed during the initial session using the Pathological Narcissism Inventory (PNI; Pincus et al., 2009), a self-report measure that assesses seven characteristics spanning narcissistic grandiosity (Grandiose Fantasy, Exploitativeness, Self-sacrificing Self-enhancement) and narcissistic vulnerability (Contingent Self-esteem, Entitlement Rage, Devaluing, Hiding the Self). Specifically, participants are asked to indicate the extent to

which 52 statements (e.g., "I need others to acknowledge me") describe them using a 6 point scale from 0 (*not at all like me*) to 5 (*very much like me*). The PNI assesses the central aspects of narcissism identified in contemporary clinical theory and research (Pincus, in press) and is designed to be consistent with how narcissism presents in clinical practice (Kealy & Rasmussen, 2012; Ronningstam, 2011). Narcissistic grandiosity (α=.83) and narcissistic vulnerability (α=.94) scores were calculated by averaging the relevant scale scores (Wright, Lukowitsky, Pincus, & Conroy, 2010).

Data Analysis

To accommodate the nested nature of the data (interactions within persons) we used multi-level regression models (Snijders & Bosker, 1999), implemented in SAS 9.2 (proc mixed; Littell, Miliken, Stoup, & Wolfinger, 1996) with a small amount of missing data (< 1%) treated as missing at random. Repeated measures variables were person-centered to separately examine between- and within-person associations (Schwartz & Stone, 1998). For example, interaction-level interpersonal perceptions were separated into time-invariant interpersonal perception scores (e.g., overall perceived communion = within-person mean = $C\mu_i$) and time-varying interpersonal perception scores (e.g., relative perceived communion = interaction-to-interaction deviations from the person-level mean = C_{ti}). All between-person variables were sample-centered to facilitate interpretation of model coefficients. Models for agentic and communal behavior were articulated separately as:

Level-1 (interaction level):

$$\text{Agentic Behavior}_{ti}=\beta_{0i}+\beta_{1i}(A_{ti})+\beta_{2i}(C_{ti})+\beta_{3i}(A_{ti} \times C_{ti})+e_{ti} \quad (1)$$

Level-2 (person level):

$$\beta_{0i}=\gamma_{00}+\gamma_{01}(A\mu_i)+\gamma_{02}(C\mu_i)+\gamma_{03}(A\mu_i \times C\mu_i)+\gamma_{04}(NG_i)+\gamma_{05}(NV_i)+\gamma_{06}(NG_i \times NV_i)+u_{0i} \quad (2)$$

$$\beta_{1i}=\gamma_{10}+\gamma_{11}(NG_i)+\gamma_{12}(NV_i)+\gamma_{13}(NG_i \times NV_i)+u_{1i} \quad (3)$$

$$\beta_{2i}=\gamma_{20}+\gamma_{21}(NG_i)+\gamma_{22}(NV_i)+\gamma_{23}(NG_i \times NV_i)+u_{2i} \quad (4)$$

$$\beta_{3i}=\gamma_{30}+\gamma_{31}(NG_i)+\gamma_{22}(NV_i)+\gamma_{33}(NG_i \times NV_i) \quad (5)$$

where A_{ti} indicates individual *i*'s relative level of *perceived agency* at interaction *t*. $A\mu_i$ indicates his or her (time-invariant) mean level of *perceived agency*. Similarly, C_{ti} and $C\mu_i$ indicate an individual's relative and mean levels of *perceived communion*. $A_{ti} \times C_{ti}$ refers to the interaction of relative interpersonal perceptions, and $A\mu_i \times C\mu_i$ refers to the interaction of mean interpersonal perceptions.

The parameter β_{0i} represents a vector containing the average level of agentic behavior for each individual (i) modeled as a function of the average level of agentic behavior in the sample (γ_{00}), individual differences in mean agentic perception (γ_{01}), mean communal

perception (γ_{02}), and their interaction (γ_{03}), included to control for mean interpersonal perception, along with individual differences in grandiose narcissism (γ_{04}), vulnerable narcissism (γ_{05}), their interaction (γ_{06}), and residual inter-individual differences/error (u_{0i}).

The parameter β_{1i} represents a vector containing the association between relative agentic perception and agentic behavior for each individual (i) modeled as a function of the average association in the sample (γ_{10}), individual differences in grandiose narcissism (γ_{11}), vulnerable narcissism (γ_{12}), their interaction (γ_{13}), and residual/error (u_{1i}).

The parameter β_{2i} represents a vector containing the association between relative communal perception and agentic behavior for each individual (i), modeled as a function of the average association in the sample (γ_{20}), individual differences in grandiose narcissism (γ_{21}), vulnerable narcissism (γ_{22}), their interaction (γ_{23}), and residual/error (u_{2i}).

The parameter β_{3i} represents a vector containing the synergistic relationship between relative agentic and communal perception and agentic behavior for each individual (i), was modeled as a function of the average association of perceiving more (or less) relative levels of agency and communion than is typical across an individual's reported social interactions (γ_{30}), individual differences in grandiose narcissism (γ_{31}), vulnerable narcissism (γ_{32}), and their interaction (γ_{33}). β_{3i} was modeled as a fixed effect due to convergence issues. The model for communal behavior is defined in the same way, except the outcome is modeled using communal behavior.

Alternative level-1 error covariance structures were tested, including unstructured, compound symmetry, AR1, and Toeplitz, and variance component error covariance structures. As none of these showed noticeable improvements in AIC, we retained the default error covariance structure in SAS 9.2 (variance component). The level-2 covariance structure was initially modeled using an unstructured G matrix where beta coefficients were allowed to covary, but we chose a variance components structure (estimating variances of random effects, but not the covariances among them) after finding it provided a more parsimonious fit to the data (−2LL nested model χ^2, df(3)= 6.70, p>.05). We investigated interactions by calculating simple intercepts and slopes at +/− 1 standard deviation from the sample means. In PROC MIXED, ESTIMATE statements were used to test the significance of these simple intercept and slope estimates, and CONTRAST statements were used to test the significant difference of the slopes.

Results

Descriptive statistics are given in Table 1. As in prior studies using the same measures (e.g., Moskowitz et al., 2007; Moskowitz & Zuroff, 2005) our sample reported behaving in a relatively agentic (M = 13.13, SD = 35.33) and communal (M=28.88, SD= 35.24) manner. Participants also perceived their interaction partner on average as relatively agentic (M=1.72, SD=0.71) and communal (M=2.06, SD=0.73). The intraclass correlation coefficient was used to calculate the proportion of variance occurring at the person level versus the interaction level and error. Across all persons, 6% of the variance in agentic

behavior was at the person level, while 11% of the variance in communal behavior was at the person level.

Agentic Interpersonal Model

We hypothesized that the relationship between interpersonal perceptions (*ifs*) and interpersonal behavior (*then*) would be moderated by levels of pathological narcissism. Agentic behavior was significantly associated with relative levels of communal perception (γ_{20}= 1.27, p<.01, r^1= 0.04), but not relative levels of agentic perception (γ_{10}), or the interaction between relative levels of agentic and communal perception (γ_{30}, see Table 2). Agentic behavior was significantly associated with both narcissistic grandiosity (γ_{04}= 2.59, *p*=.04, *r*= 0.15) and narcissistic vulnerability (γ_{05}= −2.37, *p*=.04, *r*= 0.15). We then examined how grandiosity, vulnerability, and their interaction moderated the relationship between relative interpersonal perceptions and agentic behavior. A four-way interaction emerged, suggesting that agentic behavior was associated with a combination of narcissistic grandiosity and vulnerability along with relative levels of agentic and communal perception (γ_{33}=0.40, *p*=.049, *r*= 0.02). To better understand this four-way interaction, we used perception of agency as the focal predictor for agentic behavior (see Figure 1). The X-axis represented agentic perceptions, and the Y-axis agentic behavior, therefore the slopes can be considered slopes of reciprocity (if negative) or non-reciprocity (if positive), which change as a function of communal perceptions, grandiosity, and vulnerability. Of these, three simple slopes were significant.

A positive slope indicative of agentic non-reciprocity was strongest when individuals higher in grandiosity and lower in vulnerability also perceived high levels of communion (b = .06, t(7357) = 2.93, *p* = <.01, *r*= 0.02). Significant effects for agentic non-reciprocity also occurred when higher in both grandiosity and vulnerability also perceived high levels of communion (b = .04, t(7357) = 2.54, *p* = .05, *r*= 0.02). This effect is significantly smaller than the first non-reciprocity coefficient (estimated difference in slopes, b = .02, t(7357) = 7.85, *p* = <.01). A negative slope indicative of agentic reciprocity occurred when individuals higher in grandiosity and vulnerability also perceived low levels of communion (b = −.03, t(7357) = 1.94, *p* = .05, *r*= 0.02). This effect is significantly different from the estimates of the first (estimated difference in slopes, b = .09, t(7357) = 5.58, *p* = <.01) and second (estimated difference in slopes, b = .07, t(7357) = 6.79, *p* = <.01) non-reciprocity estimates. In summary, high levels of grandiosity only evidenced non-reciprocity when the interaction partner was also perceived as more communal. When grandiosity and vulnerability were both high, effects for non-reciprocity and reciprocity depended on whether the interaction partner was seen as more communal or less communal. These findings were generally in line with our hypotheses.

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[1]Effect sizes were computed with the procedure recommended by Rosenthal and Rosnow (1984), using the formula

r= $\sqrt{F/(F+df)}$.

Communal Interpersonal Model

Communal behavior was significantly associated with relative levels of communion ($\gamma_{20}=$ 5.27, p<.01, $r=0.16$), consistent with past studies evidencing interpersonal correspondence. Communal behavior was not associated with relative levels of agency, the interaction between relative levels of agency and communion, levels of narcissism, or interactions of interpersonal perception and pathological narcissism dimensions (see Table 2). This was inconsistent with our hypothesis that the narcissistic vulnerability would be associated with lower communal behavior in response to perceiving decreased communion or increased agency (γ_{33}, not significant).

Discussion

The present investigation explored how the relationship between interpersonal perception (*if*) and interpersonal behavior (*then*) was moderated by levels of pathological narcissism. Consistent with our hypothesis, narcissistic grandiosity (e.g. high grandiosity coupled with low vulnerability) was associated with agentic non-reciprocity, but only when the interaction partner was also seen as more communal. Narcissistic vulnerability (e.g. low grandiosity coupled with high vulnerability) was not significantly associated with interpersonal patterns, contrary to our hypothesis. However, the interaction of high levels of grandiosity and vulnerability produced significant results, such that agentic reciprocity was found when the interaction partner was less communal, and agentic non-reciprocity was found when the interaction partner was more communal. Utilizing the CAPS framework, high levels of grandiosity and vulnerability may represent an individual who is reactive to status threat (grandiosity) and is also rejection sensitive (vulnerability). When an interaction partner is perceived as more communal, grandiose strategies for self-enhancement (e.g. non-reciprocity) are employed to combat ever-present concerns of status threat. But when an interaction partner is perceived as less communal, this may activate the rejection sensitivity CAU, leading to a narcissistically vulnerable state characterized by disengagement and submissive behavior (e.g. reciprocity). The combination of high grandiosity and low vulnerability may indicate rejection sensitivity is not a prominent CAU, which might explain why perceiving more agency and less communion in another does not evoke that same submissive behavior for this combination of narcissism dimensions.

Overall these results are consistent with previous findings, although it was unexpected that agentic non-reciprocity for grandiosity was only found when the interaction partner was more communal. Also, while the effect for communal correspondence (e.g. meeting friendliness with friendliness) was found, it was surprising that narcissistic grandiosity did not moderate the associations between interpersonal perceptions and communal behavior, given that aggressive responses to agentic motivations (seen in previously reviewed studies) are likely a combination of dominant and unfriendly behavior. Together, these results might suggest that in daily life narcissistic grandiosity is impacted by agentic and communal perceptions, but the behavioral response emphasizes agentic responses, which is consistent with Eaton and colleagues (2009) description of an inadequate behavioral arsenal employed to manage dysregulation. It was also surprising that narcissistic vulnerability on its own was not related to interpersonal behavior patterns. This may reflect that narcissistic vulnerability

is less interpersonally focused, and more about self-regulatory reactions to distress (see Miller, Price, Gentile, Lynam, & Campbell, 2012).

Another explanation for these findings is the use of the PNI to define grandiose and vulnerable narcissism. The PNI scales of grandiosity contain content that is less strongly related to cold and antagonistic behavior compared to other measures (e.g. self-sacrificing self-enhancement and grandiose fantasies, see Miller, Price, Gentile, Lynam, & Campbell, 2012; Pincus et al., 2009). The PNI scales of vulnerability contain content related to affect regulation (e.g. devaluing needs, rage from entitled expectations), and are less interpersonal in nature (Miller et al., 2012). Replication using multiple measures of pathological narcissism would be useful to clarify this result.

More broadly, this research demonstrated how the CAPS meta-framework could be operationalized using contemporary interpersonal theory to explain how personality pathology manifests through disturbed interpersonal relations, linking interpersonal dysfunction to the processes outlined by Eaton and colleagues (2009).

Limitations and Future Directions

There are several limitations in the study's design that should be addressed. Naturalistic designs are meant to capture how people typically behave in their daily lives. However, this longitudinal study only lasted for 7 days, and collected at most 56 interactions per participant. The study also sampled emerging adults who mainly interacted with peers. While this design provides a reasonable sampling of social interactions, one is not able to determine whether these social patterns would generalize to other weeks in the participant's life, in interactions with a different composition of interaction partners, or whether these effects hold for older individuals. A longer longitudinal design sampling a broader range of ages would be ideal to augment these preliminary findings. Like most prior event-contingent studies, we are also unable to independently verify that participants completed the interaction surveys immediately following the interaction. Additionally, the study relies exclusively on self-report data. Alternative methods such as Electronically Activated Recorders can capture naturalistic behavior that is unbiased by self-report (e.g. Holtzman, Vazire, & Mehl, 2010), however using this method exclusively would remove the subjective impression of how the participant construed the social interaction, which comes with its own limitations. The most effective study would combine both methods.

Another limitation in the study design, which is also shared with most diary studies measuring social interactions, is the restrictions of what defines a social interaction. In today's society, technology allows for meaningful interactions to occur with partners who are not face-to-face, and these social interactions are missed in the present study design. More problematic is the criterion that interactions have to last at least 5 minutes in order to be reported. The reasoning for this precedent in interpersonal diary studies is not clear, especially given recent advances in interpersonal coding suggest the perceptions of agency and communion can be coded on a second-to-second basis (Sadler, Ethier, & Woody, 2010). Simply put, cold and hostile social interactions may rarely last five-minutes, but these missing interactions could have important implications especially when conducting research

on interpersonal dysfunction and personality pathology. Future studies need to address this so that meaningful interactions are not missed.

Despite these limitations, the present research represents a promising approach to investigating personality pathology and interpersonal dysfunction in natural settings (Ebner-Priemer, Eid, Kleindienst, Stabenow, & Trull, 2009). We suggest that this type of research could be expanded in several ways. Studies using the CAPS framework should develop methods for examining the organization and chronic accessibility of CAUs directly through time-varying measures, which would add greater precision to how CAUs influence *if-then* patterns. It may also be important to link CAUs with childhood environmental events, parenting styles, or social reinforcement methods to determine how CAUs develop. The interpersonally articulated CAPS framework should also be extended to examine whether other types of personality pathology result in interpersonal patterns representative of dysfunction (Eaton et al., 2009; Pincus & Hopwood, 2012). This research would ideally be conducted in both normative and clinical samples, to investigate whether meeting clinical thresholds for personality pathology leads to changes in these interpersonal patterns and functioning. Given that the painful consequences resulting from impaired self-other processes lie at the heart of personality disorder (Pincus, 2005; Skodol 2012), furthering such an investigative framework may aid in learning how these problematic interpersonal patterns manifest and how they can ultimately be changed.

Acknowledgments

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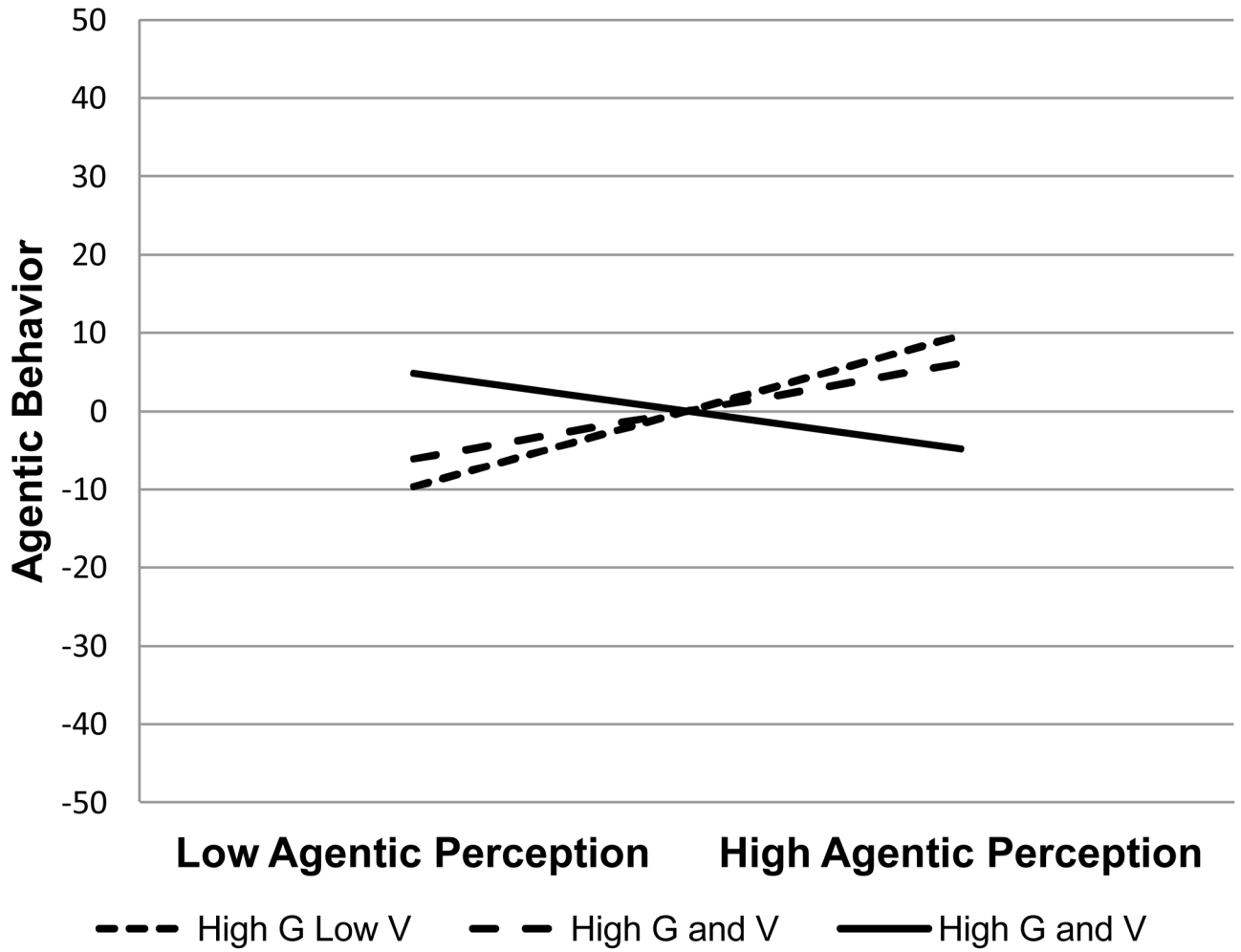
Figure 1.
Plot of significant simple slopes for the four way interaction of agentic and communal interpersonal perceptions, narcissistic grandiosity (NG) and narcissistic vulnerability (NV). Note. High and low agentic perception plotted at +/− one standard deviation (SD) from the sample centered average. High G Low V = slope calculated with grandiosity +1 SD and vulnerability −1 SD from sample centered average. High G and V = slope calculated with grandiosity and vulnerability +1 SD from sample centered average. Dashed lines represent when perceived communion was +1 SD from the sample's average, solid line represents when perceived communion was −1 SD from the sample's average. Agentic behavior ranges from −100 to 100.

Table 1

Descriptive Statistics and Correlations for Variables

Variable	1	2	3	4	5	6	7	8	Mean	SD	$ICC_{b/w}$
Within-person variables											
1. Agentic Behavior	1								13.13	35.33	0.06
2. Communal Behavior	−.03*	1							28.88	35.24	0.11
3. Relative Agentic Perception	.04*	.07*	1						0.00	1.51	0.15
4. Relative Communal Perception	.07*	.23*	.28*	1					0.00	1.60	0.15
Between-person variables											
5. Overall Agentic Perception	--	--	--	--	1				1.72	0.71	--
6. Overall Communal Perception	--	--	--	--	.37*	1			2.06	0.73	--
7. Narcissistic Grandiosity	--	--	--	--	−.07	−.03	1		2.86	0.67	--
8. Narcissistic Vulnerability	--	--	--	--	.04	−.17*	.42*	1	2.17	0.76	--

Note. Within-person n=7553. Between-person n=184. Agentic and communal behavior scores were calculated as noted in the method section, by first ipsatizing behavior scores within each interaction, then subtracting opposing poles (Dominance – Submissive= Agentic Behavior; Warmth – Coldness = Communal Behavior). Relative agentic and communal perceptions were calculated consistent with the method section, by subtracting the participant's average score from each event score (e.g. person centered). Overall agentic and communal perceptions refer to the average level of perception for each individual. We replicated the within-person correlations after removing the between-person component, and found that the correlations remained the same (to 2 decimal places of precision). SD= Standard Deviation. $ICC_{b/w}$= Intraclass correlation coefficient, representing proportion of total variance attributed to between-person differences (versus within person differences). The $ICC_{b/w}$ was calculated by fitting an unconditional means model and dividing the between person variance from the total variance (sum of the between person variance and residual).

*
p<.05.

Table 2

Moderating Effect of Pathological Narcissism on Interpersonal Perceptions and Behavior

	Agentic Behavior		Communal Behavior	
	Coefficient	SE	Coefficient	SE
Fixed Effects				
β_{0i} (moderators of agentic behavior)				
Intercept, γ_{00}	13.64*	0.84	28.44*	1.07
Aμ, γ_{01}	0.60	1.17	0.01	1.49
Cμ, γ_{02}	−1.63	1.12	2.18	1.43
Aμ × Cμ, γ_{03}	−1.05	1.34	0.39	1.70
NG, γ_{04}	2.59*	1.25	0.05	1.60
NV, γ_{05}	−2.37*	1.14	−1.13	1.45
NG × NV, γ_{06}	−0.44	1.22	2.12	1.57
β_{1i} (moderators of relative agentic perception)				
Agency, γ_{10}	0.58	0.37	0.34	0.33
Agency × NG, γ_{11}	0.42	0.57	−0.10	0.50
Agency × NV, γ_{12}	−0.28	0.52	0.63	0.46
Agency × NG × NV, γ_{13}	−0.09	0.55	0.40	0.49
β_{2i} (moderators of relative communal perception)				
Communion, γ_{20}	1.27*	0.40	5.27*	0.39
Communion × NG, γ_{21}	0.21	0.58	0.67	0.60
Communion × NV, γ_{22}	0.64	0.52	−0.35	0.54
Communion × NG × NV, γ_{23}	0.32	0.57	−0.41	0.59
β_{3i} (moderators of relative agentic × communal perception)				
Agency × Communion, γ_{30}	0.03	0.14	0.24	0.13
Agency × Communion × NG, γ_{31}	0.17	0.21	0.38	0.19
Agency × Communion × NV, γ_{32}	−0.22	0.18	0.01	0.17
Agency × Communion × NG × NV, γ_{33}	0.40*	0.20	−0.23	0.19
Random Effects				
Variance Intercept, σ^2_{u0i}	68.67*	10.55	134.65*	17.09
Variance Linear Slope, σ^2_{u1i}	5.18*	1.98	2.98*	1.53
Variance Linear Slope, σ^2_{u2i}	8.27*	3.78	10.05*	2.38
Residual Variance, σ^2_{eti}	1142.31*	19.21	996.38*	16.87
−2LL	74962.3		74085.4	
AIC	74970.3		74095.4	

Note. Analyses were based on 7553 observations from 184 participants. Unstandardized estimates and standard errors. SE= Standard Error. Communion= person centered communal perception. Cμ= Sample centered communal perception. Agency= person centered agentic perception. Aμ= Sample centered agentic perception. NG= Narcissistic Grandiosity. NV= Narcissistic Vulnerability.

*
 $p < 05$.