

Affective Contingencies of Narcissism

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Several theories propose that narcissism is rooted in affective contingencies. Given narcissists' focus on power, these contingencies should be strong in the power domain but not in the affiliation domain. We systematically investigated narcissists' contingencies and explored whether these contingencies might link narcissism to social behavior. In a multimethod longitudinal study, we assessed unidimensional narcissism levels as well as two main narcissistic strategies: Admiration and rivalry. We measured 209 participants' affective contingencies (i.e., affective responses to satisfying and frustrating experiences of power and affiliation) via self-reports ($n = 207$) and facial electromyography (fEMG, $n = 201$). In a 1-year follow-up, we observed participants' power- and affiliation-related behaviors in the laboratory (valid $n = 123$). Results indicated that narcissism was linked to increased affective reactivity to power, and this pattern was present for both admiration and rivalry. Narcissism was unrelated to affective reactivity to affiliation, with an important exception: Individuals with higher levels of narcissistic rivalry exhibited decreased reactivity toward satisfactions and increased reactivity toward frustrations of affiliation. Results were more robust for self-reported than for fEMG-indexed reactivity. Although overall narcissism and narcissistic admiration were related to power-related behaviors 1 year later, affective contingencies did not generally account for these links. These findings inform why narcissists have a relatively strong power motive and why some narcissists high in rivalry have a relatively weak affiliation motive. More broadly, these findings provide insight into the affective contingencies underlying personality traits and call for research on the contexts in which these contingencies guide behavior.

Keywords: narcissism, social power, affiliation, affect, facial electromyography

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Narcissism is a personality trait marked by a sense of grandiosity, superiority, and entitlement to special treatment (Miller & Campbell, 2008). Prominent theoretical approaches have proposed that narcissism is rooted in affective contingencies that have a motivational function (Back et al., 2013; Baumeister & Vohs, 2001; Grapsas, Brummelman, et al., 2020; Morf, 2006; Morf & Rhodewalt, 2001). This idea is consistent with broader theories proposing that individual differences in personality traits are rooted in individual differences in underlying motivational–emotional

systems (Denissen & Penke, 2008; Dweck, 2017; Fleenon & Jayawickreme, 2015; Freud, 1927; Geukes, van Zalk, et al., 2017; Mischel & Shoda, 1995; Wrzus & Roberts, 2017). However, the affective contingencies of narcissism have not been systematically investigated. This limits our understanding of the building blocks of narcissism and personality more broadly. We specifically focused on grandiose narcissism (hereafter: narcissism), which is characterized by both agentic (e.g., extraversion, assertiveness, sense of grandeur) and antagonistic (e.g., arrogance,

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A small portion of the lab data used in this manuscript has been used in prior studies on distinct research topics (Dufner et al., 2015, 2018; Hess et al., 2017).

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exploitativeness, disdain for others) tendencies (Back et al., 2013; Crowe et al., 2019; Miller et al., 2017). We tested the core hypothesis that narcissism is rooted in an affective system that is especially reactive to situations involving social power, but not to situations involving affiliation. We measured affective contingencies as responses to power- and affiliation-related experiences using both self-reports and facial electromyography (fEMG). We also explored whether these affective contingencies might explain previously established links between narcissism and social behavior.

The Affective Contingencies of Personality

Several personality theories suggest that personality is rooted in fundamental psychological motives (i.e., higher-order goals that are nonderivative of other goals; Dweck, 2017; Fleeson & Jayawickreme, 2015; Freud, 1927; Geukes, van Zalk, et al., 2017; Wrzus & Roberts, 2017). These theories postulate that motives represent the *why* of personality: As people attempt to fulfill their motives, they form increasingly consistent and frequently recurring patterns of thinking and acting that serve motive fulfillment—patterns which comprise their personality traits. Related research has shown that basic personality traits like the Big Five can be conceptualized as motivational constructs, namely desires for specific experiences that are central to corresponding trait-relevant behaviors (e.g., agreeableness corresponds to a desire to engage in altruistic behavior; Denissen & Penke, 2008). This motivational perspective on personality can be useful in understanding the similarities and dissimilarities between personality traits (e.g., enjoying the company of others relates to both extraversion and agreeableness; Wood et al., 2015).

Given that motives represent dispositional desires for specific end states, affective experiences have been theorized to be at the heart of motives. According to motive disposition theory (McClelland, 1987), people's motives represent attractions toward specific motive-satisfying incentives and experiences. These incentives and experiences are affectively charged, in that people feel pleasure when their motives are satisfied and displeasure when their motives are frustrated. People differ in how much pleasure and displeasure they are predisposed to feel from diverse motive-satisfying or motive-frustrating experiences (Brunstein et al., 1998; McClelland, 1987). That is, they differ in motive-specific *affective contingencies* (i.e., positive or negative affective reaction tendencies to motive-specific experiences). For example, people with a strong power motive (i.e., desire to socially influence others) tend to experience more excitement when recalling pleasant memories related to power (Woike, 1994), and to frown more—a sign of displeasure—when audiences are displeased by their impromptu speech (Fodor et al., 2006). Individual differences in affective contingencies can explain why some people are generally more motivated than others to strive toward motive-specific satisfying experiences, or to avoid frustrating ones. For example, people with pronounced affective contingencies in the domain of affiliation prefer watching comedy and romance movies and show interpersonally warm and friendly interaction behavior, presumably because such behaviors lead to pleasant affiliative experiences (Dufner et al., 2015). Thus, to understand the roots of personality traits and their associated behaviors, one may start from their underlying affective contingencies.

The Affective Contingencies of Narcissism

What could be the affective contingencies underlying narcissism? According to the Dynamic Self-regulatory Processing Model of narcissism (Morf, 2006; Morf & Horvath, 2010; Morf & Rhodewalt, 2001), narcissism comprises a coherent system of “if ... then” affective, cognitive, and behavioral contingencies that serve the maintenance of a grandiose self. According to the model, narcissists (i.e., individuals with relatively high levels of narcissism, not necessarily individuals with a clinical diagnosis) achieve this via self-assertion and personal advancement (i.e., “getting ahead”; Morf & Rhodewalt, 2001, p. 190), even if this comes at the cost of maintaining good relationships with others (for similar arguments, see Baumeister & Vohs, 2001; Campbell & Foster, 2007; Campbell et al., 2006). Expanding this work, contemporary models of narcissism link narcissists' strivings to fundamental social motives. These models propose that narcissism is a personality trait that serves the fulfillment of a relatively strong power motive that overshadows in strength other motives, such as the affiliation motive (Grapsas, Brummelman, et al., 2020; Johnson et al., 2012; Mahadevan et al., 2016; Zeigler-Hill, McCabe, et al., 2018). If such motive dynamics underlie narcissism, they should be evident in the strength of narcissists' affective contingencies in the domains of power and affiliation motivation.

Preliminary Evidence

Power Motive

Several lines of evidence suggest that narcissists have a relatively strong power motive. Narcissists tend to construct projective narratives revolving around power and regularly fantasize about having power (Carroll, 1987; Raskin & Novacek, 1991). Narcissists also report a strong desire for power (Bradlee & Emmons, 1992; Grove et al., 2019; Jonason & Zeigler-Hill, 2018; Sturman, 2000; Thomaes, Stegge, et al., 2008; Zeigler-Hill, Vrabel, et al., 2018). To gain power, narcissists may publicly brag about their accomplishments and showcase their talents (Buss & Chiodo, 1991; Wallace & Baumeister, 2002).

Narcissists' relatively strong power motive may be reflected in an increased affective contingency toward experiences of power and powerlessness (e.g., “if I have power, *then* I feel great”; Mischel & Shoda, 1995). Preliminary evidence suggests that narcissists tend to like themselves more when they garner power, with evidence at the trait level (Thomaes, Stegge, et al., 2008; Zeigler-Hill et al., 2008) and at the state level (Thomaes et al., 2010; Zeigler-Hill, Vrabel, et al., 2018). This enjoyment of power is present from a young age. Narcissistic children were found to show zygomaticus major activity (reflecting smiling), more so than children lower in narcissism, when rising the ranks of popularity (Grapsas, Brummelman, et al., 2020). By contrast, narcissists are often especially frustrated when they are powerless. For example, narcissists tend to exhibit increased levels of negative affect (Alexander et al., 2020; Benson et al., 2016; Wright et al., 2017), anger (Rhodewalt & Morf, 1998; Stucke & Sporer, 2002), and aggression in response to powerlessness, provocation, or failure (for reviews and meta-analyses on narcissistic aggression, see Denissen et al., 2018; Kjærviik & Bushman, 2021; Rasmussen, 2016)—though the link between narcissism and provoked aggression has not always been replicated (e.g., Kirkpatrick

et al., 2002; Reidy et al., 2010), and some evidence suggests that it is specific to vulnerable narcissism (Krizan & Johar, 2015). Based on these findings, narcissists should experience increased pleasure when powerful, and increased displeasure when powerless.

Affiliation Motive

Whereas there is consistent evidence linking narcissism to a strong power motive, there is mixed evidence on the association between narcissism and the affiliation motive. Some studies have found evidence for a weakened desire for intimacy (Carroll, 1987; Ojanen et al., 2012; Thomaes, Stegge, et al., 2008), others for an increased desire for affiliation (Jonason & Zeigler-Hill, 2018; Mahadevan & Jordan, 2021; Ojanen et al., 2012; Zeigler-Hill, Vrabel, et al., 2018), and others have found no relation between narcissism and affiliation (Bradlee & Emmons, 1992; Carroll, 1987; Findley & Ojanen, 2013).

A possible reason for the mixed nature of this evidence might be that different facets of narcissism might be differently linked to the affiliation motive. According to the Narcissistic Admiration and Rivalry Concept (Back et al., 2013) and the Status Pursuit In Narcissism model (Grapsas, Brummelman, et al., 2020), narcissism encompasses agentic tendencies (also labelled “narcissistic admiration”) and antagonistic tendencies (also labelled “narcissistic rivalry”), which are theorized to represent two distinct strategies through which narcissists maintain their grandiosity and sense of power (Back et al., 2013; Grapsas, Brummelman, et al., 2020). Individual differences in narcissistic admiration and rivalry might be differently linked to individual differences in affective contingencies in the affiliation domain. Narcissistic admiration encompasses self-promoting thoughts and behaviors. Thus, individuals with high levels of narcissistic admiration might strive primarily for power. However, they might also be not indifferent to affiliation, and might even be superficially affiliative (Back et al., 2010, 2013; Holtzman et al., 2010) if this helps them to build a network that facilitates their power pursuit (Mahadevan & Jordan, 2021), or to fulfill their sexual desires (Holtzman & Donnellan, 2015; Jonason et al., 2009). Indeed, narcissistic admiration has been found slightly positively associated with the affiliation motive (Mahadevan & Jordan, 2021; Zeigler-Hill, Vrabel, et al., 2018). Yet, in contexts in which affiliation will not yield power, or any other secondary benefits, narcissism may not be related to the affiliation motive. Therefore, individuals with higher levels of narcissistic admiration might exhibit either average or slightly stronger-than-average affective contingencies in the affiliation domain.

Unlike narcissistic admiration, narcissistic rivalry encompasses other-derogatory thoughts and behaviors, including interpersonal behaviors of social conflict and aggression. Individuals with high levels of narcissistic rivalry set hostile interpersonal goals and tend to be interpersonally mistrustful (Grove et al., 2019). Thus, individuals with high levels of narcissistic rivalry might strive for power, but they should also be less concerned with affiliation than individuals lower in rivalry (Back, 2018; Grapsas, Brummelman, et al., 2020). If so, then individuals with higher levels of narcissistic rivalry might exhibit weaker affective contingencies in the domain of affiliation than individuals lower in rivalry, deriving attenuated pleasure from satisfying affiliative experiences and attenuated displeasure from frustrating affiliative experiences.

Methods to Capture the Affective Contingencies of Narcissism

Affective contingencies can be measured via self-reports of overall affective reactivity, as well as via physiological reactions that capture real-time affective reactivity. In the current research, we used physiology in addition to self-reports, as people are at times not able or willing to report their motives or affect, and it is often their unreported motives and spontaneous affective reactions toward motive-relevant experiences that guide behavior (see McClelland et al., 1989; Schultheiss & Köllner, 2021 for reviews).

Physiological assessments of contingencies might be especially relevant in the case of narcissism. Narcissists tend to be invested in radiating a grandiose image to others (Morf & Rhodewalt, 2001), which might lead them to suppress or deny negative affective experiences that reflect fragility or insecurity. For example, when they receive disappointing feedback, narcissistic children have a tendency to blush—an involuntary reddening of the face that signals embarrassment—even though they may deny their blushing in self-reports (Brummelman, Nikolić, et al., 2018). Similar observations have been made in adults. One study found that when adult narcissists were ostracized, they showed increased activity in an area of the brain (anterior insula, dorsal anterior cingulate cortex, and subgenual anterior cingulate cortex) that is associated with social pain, although they claimed not feeling distressed (Cascio et al., 2015). Another study found that narcissistic males exhibited high basal cortisol levels—a sign of chronic stress—even though they did not report higher levels of stress (Reinhard et al., 2012—but see Bukowski et al., 2009 for contradictory findings in adolescence). Thus, emerging evidence suggests that physiological measures can be used in a complementary way to self-reports to capture narcissists’ affective contingencies, especially when these involve negative affective reactions in response to frustrations (see Coleman et al., 2019; Jauk & Kanske, 2021 for reviews).

As a physiological indicator of real-time affective reactions, we used facial electromyography (fEMG), a method that can unobtrusively detect subtle facial muscle contractions of the zygomaticus major (contracted when smiling, suggesting positive affect) and the corrugator supercilii (contracted when frowning, suggesting negative affect). Facial electromyography has been shown to be a reliable method to assess the intensity of positive and negative affect in real time (Barrett et al., 2019; Cacioppo et al., 1986, 2000; Hess et al., 2017). In some cases, fEMG responses are more revealing than self-reports. For example, more prejudiced Whites were found to frown more when viewing images of Blacks, despite reporting that they perceived Blacks as friendly as less prejudiced Whites did (Vanman et al., 1997). Also, people who smiled more in response to pictures of their romantic partner showed more positive behavior toward them, even controlling for self-reported relationship satisfaction (Krause & Dufner, 2020). Likewise, individuals who smiled more and frowned less in response to affiliation images were found to be more interpersonally affiliative, even after controlling for self-reported affiliation motive levels (Dufner et al., 2015, 2018). These findings suggest that physiological reactions captured by fEMG measures have incremental validity in predicting behavior. Most such studies, however, are limited by the use of fEMG in single tasks, which limits understanding about the extent to which affective reactions might be generalizable across contexts. To address this

issue, we used fEMG in a broad array of motive-relevant tasks (e.g., listening stories, playing games). In this manner, our study is the first systematic, broadband investigation of the affective contingencies of narcissism.

The Present Study

In this multimethod study, we systematically examined the affective contingencies of narcissism in the content domains of power and affiliation. We assessed overall narcissism, as well as narcissistic admiration and narcissistic rivalry. To capture affective contingencies, we measured participants' (a) subjective affective reactivity to satisfying and frustrating experiences of power and affiliation using self-report and (b) their objective, real-time affective responses to satisfying and frustrating experiences of power and affiliation using fEMG. One year later, we video-observed participants' power and affiliation behaviors during a structured interaction in the lab. We did not expect high convergence between self-reported and fEMG-assessed affective reactivity, but we explored their relations. We hypothesized that overall narcissism and narcissistic admiration would be related to stronger affective responses (i.e., higher positive and/or lower negative responses toward satisfaction and vice versa to frustration) to experiences of power, but that they would not substantially be related to experiences of affiliation (i.e., small positive or null associations with affiliation contingencies). In addition, we hypothesized that narcissistic rivalry would be related to *stronger* affective responses to experiences of power and *weaker* affective responses to affiliation. Given that affective contingencies can underlie motivated behavior, we hypothesized that the overlap between narcissism and these affective reactivity indices would partly account for the previously documented associations between narcissism and power- and affiliation-related behaviors. Specifically, we hypothesized that the positive association between narcissism and power behaviors would be mediated by increased power contingencies, and that the negative association between narcissistic rivalry and affiliation behaviors would be mediated by decreased affiliation contingencies. We did not preregister our study design, hypotheses, or analysis plans. We did make our data and code available via the Open Science Framework (OSF; <https://osf.io/qw6rx/>).

Method

Ethics Statement

The study was approved by the ethics committee of Institute of Psychology of the Humboldt University of Berlin, protocol number 2010-03, study entitled "Accuracy of self-rated motive dispositions: Assessment of processes, moderators and developmental dynamics."

Participants

Participants were 209 university students aged 22–41 years ($M = 27.48$, $SD = 3.07$; 66% women, 34% men; 88% German, 9% other, 3% missing) recruited from German universities in Berlin and nearby cities. The sample size was determined based on the mean correlation effect size ($r = .21$) reported in personality and social psychology (Richard et al., 2003), yet we slightly

oversampled to ensure that participant attrition in the follow-up would not unduly influence our results. We collected self-report data available for 207 participants, fEMG data for 201 participants, and behavioral data for 123 participants. We conducted power analyses with the R pwr package (Version 1.3-0; Champely, 2020) for each of our confirmatory analyses, with an α of .05, two-tailed (available on OSF). To detect a correlation of $r = .21$, we had 87% power for analyses between self-reports ($n = 207$), 85% power between self-reports and fEMG ($n = 199$), 65% power for analyses between self-reports and observed behavior ($n = 123$), and 63% power for analyses between fEMG and observed behavior ($n = 117$).

We recruited participants from various study programs but excluded psychology students, as they could be potentially familiar with the study content and procedures. The data were collected as part of a study on motivation and personality. A small portion of the lab data used in this study has been used in prior studies on distinct research topics (Dufner et al., 2015, 2018; Hess et al., 2017). None of the results pertaining to narcissism have been published before. A list of the measures that we used and the studies in which they have been included is presented in the Supplemental Material (Table S1).

Procedure

Narcissism

To derive an index of overall narcissism, participants completed the 15-item version of the Narcissistic Personality Inventory (NPI; Schütz et al., 2004). The NPI consists of pairs of statements. Each pair contains one narcissistic (e.g., "I think I am a special person"), and one nonnarcissistic statement (e.g., "I am no better or worse than most people"). Participants chose the statement that best described them. The total score is the proportion of endorsed narcissistic statements ($M = .34$, $SD = .23$, $\alpha = .79$, $Mr_{\text{inter-item}} = .20$). To derive indexes of narcissistic admiration and rivalry, participants completed the 18-item Narcissistic Admiration and Rivalry Questionnaire (NARQ; Back et al., 2013), with nine items assessing narcissistic admiration (e.g., "I enjoy thinking about how special I am") and nine items assessing narcissistic rivalry (e.g., "I want my rivals to fail"), all rated on a 6-point scale (1 = *not agree at all*–6 = *agree completely*). Responses were averaged for admiration ($M = 3.43$, $SD = .84$, $\alpha = .85$, $Mr_{\text{inter-item}} = .38$) and rivalry ($M = 2.35$, $SD = .84$, $\alpha = .83$, $Mr_{\text{inter-item}} = .36$).

Self-Reported Affective Contingencies

For the purposes of the study, we constructed self-report scales that assessed the tendency to experience positive affect in response to motive satisfaction and negative affect in response to motive frustration.

Power. Participants responded to five items assessing positive affect in response to power satisfaction (e.g., "When I can influence a whole group of people, I feel good") and to five items assessing negative affect in response to power frustration (e.g., "When I have no influence, I feel uncomfortable"). Items were rated on 5-point Likert scale (1 = *not agree at all*–5 = *agree extremely*). Responses were averaged across items for power satisfaction ($M = 3.34$, $SD = .78$, $a = .83$, $Mr_{\text{inter-item}} = .48$) and frustration ($M = 3.10$, $SD = .74$, $a = .80$, $Mr_{\text{inter-item}} = .45$).

Affiliation. Participants responded to five items assessing positive affect in response to affiliation satisfaction (e.g., “When I make new friendships, I feel good”) and to five items assessing negative affect in response to affiliation frustration (e.g., “When others do not like me, that makes me unhappy”). Items were rated on 5-point Likert scale (1 = *not agree at all*–5 = *agree extremely*). Responses were averaged across items for affiliation satisfaction ($M = 4.39$, $SD = .51$, $a = .80$, $Mr_{\text{inter-item}} = .41$) and frustration ($M = 3.37$, $SD = .79$, $a = .79$, $Mr_{\text{inter-item}} = .43$).

Validity Assessment. We examined the validity of these scales in two ways (details in [Supplemental Material](#)): First, via factor analysis and second, via correlations with motive self-reports. First, we ran a parallel analysis (Zwick & Velicer, 1986), which indicated the existence of four factors (Figure S1), and then conducted a factor analysis with Maximum Likelihood Estimation and Oblimin Rotation (Supplemental Material, Table S2). The results suggested that scale items loaded most strongly on their intended factors (with one exception and a few cross-loadings in power and affiliation frustration). Second, we correlated the total scale scores with the power and affiliation scores on the Unified Motive Scales (Schönbrodt & Gerstenberg, 2012), which we also administered in the study (Supplemental Material). Power reactivity items were more strongly correlated with self-reported power motivation than with affiliation motivation, whereas affiliation reactivity items were more strongly correlated with self-reported affiliation motivation than with power motivation. These results boost the convergent validity of our self-reported affective contingencies measures.

fEMG-Indexed Affective Contingencies

During a laboratory session, we assessed participants’ affective responses to satisfying and frustrating experiences of power and affiliation via fEMG. Following standard procedures (Fridlund & Cacioppo, 1986), we recorded muscle activity of the zygomaticus major (contracted when smiling) and the corrugator supercilii (contracted when frowning) on the left side of the face. We focused on the left side of the face because some studies have shown that it exhibits stronger spontaneous zygomaticus and corrugator muscle activity than the right side (Dimberg & Petterson, 2000; Zhou & Hu, 2004). We note, however, that other studies did not support this conclusion (Achaibou et al., 2008; Ekman et al., 1981). We placed two bipolar, 4-mm standard nonpolarizing silver/silver chloride surface electrodes on each muscle and a common reference electrode on the forehead (Fridlund & Cacioppo, 1986). The fEMG signal was recorded with a digital Psychlab amplifier at a sampling frequency of 1,000 Hz amplified by 10,000. The recorded raw EMG signal of each muscle was bandpass-filtered to include signals from 30 to 300 Hz. After filtering, the fEMG signal was rectified (such that higher absolute values reflected stronger muscle activity) and then within-person z -standardized (to control for between-person differences, for example those related to muscle anatomy; Hess et al., 2017).

Lab Tasks. Given that this is the first study to measure affective contingencies of power and affiliation in narcissism, we used a broadband approach to examine affective reactions in a range of tasks tapping three levels of experience: First-person immersive experiences evoked via computer games, first-person imaginative experiences evoked via imagination exercises, and third-person observer experiences evoked via viewing of images. All participants

were presented with all tasks. To control for task sequence effects, task sequence was randomized across participants.

Power Experiences. To induce power experiences, we used three tasks in which participants experienced power satisfaction and frustration.

First, participants *played a single-player computer game* that was designed specifically for the purpose of this study. In this game, participants took the role of a politician and received 10 requests to make political decisions. Per decision, participants could select from two options equally strong in power content (e.g., choice to resolve political party disagreements by either planning a meeting or by trying to persuade dissenting party members). Five choices were programmed to be successful (power satisfaction) and five were programmed to be unsuccessful (power frustration). When successful, participants’ decision was followed by a triumphant sound. When unsuccessful, participants’ decision was followed by a reprimand by a superior.

Second, participants did an *imagination exercise*. With their eyes closed, participants listened to a narrative that described them being powerless against a rival in the past (power frustration) but powerful against the rival in the present (power satisfaction). Specifically, participants were asked to imagine that they worked as a higher officer in a company’s HR department, where they would be responsible for interviewing and hiring candidates for a vacancy. The narrative then focused on one candidate, a former university rival who in the past was braggy and belittling toward the participant, and who had used personal contacts to land a job the participant had also applied for (power frustration). Thereafter, the narrative stated that the participant had the power to reject the rival’s application as he was underqualified, his Curriculum Vitae contained false information, and his contacts were unable to secure him the job (power satisfaction).

Third, participants were presented with *images* representing power (Hess et al., 2017). Four images depicted powerful people (e.g., a politician waving at a crowd; power satisfaction) and four images of powerless people (e.g., a sitting protestor being gagged; power frustration).

Affiliation Experiences. To induce affiliation experiences, we used three tasks in which participants experienced affiliation satisfaction and frustration. These tasks were structured in a similar way as those that were used to assess power.

First, participants played the *Cyberball game* (Williams & Jarvis, 2006), a validated task that induces social inclusion and exclusion. In this game, participants play a virtual toss-ball game with two fictitious others (programmed as little avatars). Participants began the game with a period wherein they were included in the ball toss (affiliation satisfaction), followed by a period wherein participants were excluded from the ball toss (affiliation frustration).

Second, participants engaged in an *imagination exercise*. With their eyes closed, they listened to a narrative that described first feeling rejected by a friend (affiliation frustration), but then finding out that this was a misunderstanding (affiliation satisfaction). Specifically, participants were asked to imagine that they were on a long flight to a foreign country, visiting their best same-sex friend, who would pick them up from the airport. The friend was not at the airport, and the narrative focused on the participants’ feelings of social rejection (affiliation frustration). The friend eventually arrived, apologized for being late, and showed great joy for reuniting (affiliation satisfaction).

Table 1
Lab Tasks and Corresponding Reliability Coefficients and Mean Inter-Item Correlations of Zygomaticus and Corrugator Activity

Task	Baseline (duration)	Task fEMG measurement	Events (N)	fEMG reliability (mean inter-item correlation)	
				Zygomaticus	Corrugator
Power game (politician)	Video of an unpopulated beach at sunset (30 s)	5 s after each satisfying and frustrating event	Frustration events (5): Unsuccessful political decisions, indicated by a reprimand	$a = .47$ ($M_{r_{inter-item}} = .15$)	$a = .73$ ($M_{r_{inter-item}} = .35$)
			Satisfaction events (5): Successful political decisions, indicated by a triumphant sound	$a = .41$ ($M_{r_{inter-item}} = .12$)	$a = .74$ ($M_{r_{inter-item}} = .37$)
Power imagination exercise	Instructions for progressive relaxation (30 s)	Throughout the narrative	Frustration period (eight subperiods): Participant's past powerlessness against a rival	$a = .86$ ($M_{r_{inter-item}} = .44$)	$a = .93$ ($M_{r_{inter-item}} = .62$)
			Satisfaction period (seven sub-periods): Participant's current power over a rival	$a = .86$ ($M_{r_{inter-item}} = .47$)	$a = .95$ ($M_{r_{inter-item}} = .72$)
Power images	Fixation cross preceding each image (1 s)	3 s after image presentation	Frustration pictures (4): Images depicting people in positions of low power	$a = .21$ ($M_{r_{inter-item}} = .06$)	$a = .40$ ($M_{r_{inter-item}} = .14$)
			Satisfaction pictures (4): Images depicting people in positions of high power	$a = .26$ ($M_{r_{inter-item}} = .08$)	$a = .38$ ($M_{r_{inter-item}} = .13$)
Affiliation game (cyberball)	Video of an unpopulated beach at sunset (30 s)	Throughout the game	Frustration period (split into two subperiods): Participant is completely excluded from a ball toss game	Average split-half reliability (10,000 bootstraps) = .84 ($M_{r_{inter-item}} = .72$)	Average split-half reliability (10,000 bootstraps) = .85 ($M_{r_{inter-item}} = .74$)
			Satisfaction period (split into two sub-periods): Participant is the most frequent recipient of the ball in a ball toss game	Average split-half reliability (10,000 bootstraps) = .84 ($M_{r_{inter-item}} = .72$)	Average split-half reliability (10,000 bootstraps) = .90 ($M_{r_{inter-item}} = .82$)
Affiliation imagination exercise	Instructions for progressive relaxation (30 s)	Throughout the narrative	Frustration period (eight subperiods): Participant's sense of abandonment and rejection by their best friend	$a = .85$ ($M_{r_{inter-item}} = .42$)	$a = .97$ ($M_{r_{inter-item}} = .79$)
			Satisfaction period (seven subperiods): Participant's reunion with their best friend	$a = .88$ ($M_{r_{inter-item}} = .51$)	$a = .95$ ($M_{r_{inter-item}} = .73$)
Affiliation images	Fixation cross preceding each image (1 s)	3 s after image presentation	Frustration pictures (4): Images depicting social exclusion	$a = .27$ ($M_{r_{inter-item}} = .09$)	$a = .32$ ($M_{r_{inter-item}} = .10$)
			Satisfaction pictures (4): Images depicting social inclusion	$a = .61$ ($M_{r_{inter-item}} = .28$)	$a = .45$ ($M_{r_{inter-item}} = .17$)

Note. fEMG = facial electromyography.

Third, participants were presented with *images* representing affiliation (see Dufner et al., 2015 for validation). Four images depicted inclusion (e.g., a hiking group on a grass field, holding hands; affiliation satisfaction) and four images depicted exclusion (e.g., a sad girl sitting marginalized on the playground; affiliation frustration).

Data Reduction. Before each task, participants were presented with neutral content to reach a neutral affective state (Table 1 for details). fEMG activity during this period served as baseline. We baseline-corrected muscle activity by partialing out muscle activity during each baseline from muscle activity during each task. We computed the reliability of baseline-corrected fEMG signals per task, muscle, and separately for satisfactory and frustrating events/periods. fEMG reliabilities were overall acceptable, but varied across tasks from low (e.g., power images) to high (e.g., power imagination exercise; Table 1). Finally, we computed affective reactivity indices by aggregating baseline-corrected muscle activity scores, separately for events/periods of satisfaction and frustration in each task.

Validity Assessment. We examined the validity of these tasks in two steps (details in Supplemental Material). First, we piloted in three studies all experimental tasks except for the affiliation and power frustration images (we piloted different tasks per study). In all pilot studies, after each task (and image), participants rated how much the content of the task dealt with the topics of power and affiliation. We examined the differences in the ratings for power versus affiliation content per task via paired *t* tests. The results indicated that all tasks most strongly tapped into the motive domain they were designed for (Supplemental Material, Table S3). Second, we correlated the fEMG indices with measures of self-reported affect, which we also obtained in the study. After each task, participants rated how much positive and negative affect they experienced during the task (1 = *not at all*–5 = *very much*). As partial evidence for convergent validity between real-time physiological reactions to self-reports, zygomaticus reactivity was generally significantly positively associated with higher self-reported positive affect (*Mdn* $r = .15$, $r_{\text{range}} = -.19-.29$), whereas corrugator reactivity was generally significantly associated with lower self-reported positive affect (*Mdn* $r = -.12$, $r_{\text{range}} = .00-.25$; correlations reported in Supplemental Material, Table S2).

Observed Behavior

One year after the first laboratory session, participants were re-invited to the lab (182 participants attended this session). After applying a Bonferroni correction, participant attrition was not significantly linked to gender, age, ethnicity, narcissism, or affective reactivity (results presented in the Supplemental Material). At the end of the session, participants engaged in a semi-structured interaction with an experimenter. The experimenter asked four questions: (a) “How did you like the experiment?” (b) “Do you feel like you have gained something out of participating here?” (c) “Have you found a job yet?” Then, if the answer was “yes”: “How is it in your new job?” If the answer was “no”: “What have you been doing lately?” and (d) “What are your plans for the future?” The experimenter asked one question at a time and gave participants time to speak as long as they wanted to. We selected this task as it is social in nature but does not explicitly call for power- or affiliation-related behaviors, thus leaving room for individual differences in such

behaviors to emerge. Participants’ behavior during this interaction was filmed and coded by three independent coders who were blind to participants’ narcissism scores. Ratings were made on 5-point scale (1 = *never occurs/do not agree at all*, 5 = *occurs very often/strongly agree*—see Supplemental Material, Table S5 for inter-rater reliability of ratings). Due to a partial malfunction of the video-recording equipment, only data from 123 participants could be retrieved.

We selected several coded behaviors that reflected power and affiliation. We first ran a parallel analysis which indicated the existence of two factors (Supplemental Material, Figure S2), and then conducted a factor analysis with Maximum Likelihood Estimation and Oblimin Rotation (Supplemental Material, Table S5). Two uncorrelated ($r = .03$) factors emerged and accounted for 51% of the variance in behavior. Consistent with prior research that has identified two broad factors of agency and communion in social behavior (e.g., Acton & Revelle, 2002; Markey & Markey, 2009; Wiggins, 1995), we identified one factor (22% of variance explained) reflecting power-related behaviors (*brash gestures, loud voice, interrupting experimenter, attempts to dominate the conversation, boasting*), and another factor (29% of variance explained) reflecting affiliation-related behaviors (*smiling, relaxed laughter, social warmth, is friendly, aims to create pleasant atmosphere, angry, or disgusted facial expressions—reverse coded*). Power-related behaviors loaded more strongly on the power behavior factor (loadings range: .417–.982, *Mdn* loading = .603) but were relatively independent of the affiliation behavior factor (loadings range: $-.043-.223$, *Mdn* loading = .032). Affiliation-related behaviors loaded more strongly on the affiliation behavior factor (loadings range: .386–.956, *Mdn* loading = .714) but were relatively independent of the power behavior factor (loadings range: $-.227-.121$, *Mdn* loading = .008). Ratings were subsequently averaged for power ($M = 2.04$, $SD = 0.53$, $a = .77$) and affiliation ($M = 3.42$, $SD = 0.53$, $a = .85$) behaviors.

Analytic Procedure

To examine the affective contingencies of narcissism in the domains of power and affiliation, we computed correlations of narcissism with self-reported and fEMG assessments of affective reactivity. To examine whether narcissism was directly associated with power and affiliation behaviors, we computed correlations of narcissism with those behaviors. We also explored whether correlations of narcissism with power versus affiliation reactivity and behaviors were significantly different, by comparing the correlations using the formula for dependent correlation comparisons (Steiger, 1980). To examine whether narcissism was indirectly associated with power- and affiliation-related behaviors via affective contingencies, we computed partial correlations and conducted mediation analyses (with a single mediator) with 5,000 bootstraps, in which affective reactivity toward power or affiliation mediated the respective associations between narcissism and power or affiliation behaviors. In the mediation models, we exclusively focused on those affective reactivity indices that were simultaneously related to narcissism and behavior (MacKinnon et al., 2007). All analyses were carried out in R (Version 3.5.0; R Core Team, 2019), using the Hmisc package (Version 4.4.0; Harrell, 2020) for correlation analyses, the RVAideMemoire package (Version 0.9-80; Hervé, 2021) for partial correlation analyses, and the psych package (Version

Table 2
Correlations, Confidence Intervals, and Correlation Comparisons Between Motive Domains of Narcissism Indices With Affective Contingency Indices and Observed Behavior

Index	Correlations			Correlation comparisons (power vs. affiliation)			
	Overall narcissism	Narcissistic admiration	Narcissistic rivalry	Comparison domain	Overall narcissism	Narcissistic admiration	Narcissistic rivalry
Self-reported contingencies							
Power							
Satisfaction	.49** [.37, .58]	.52** [.41, .61]	.45** [.33, .55]	Satisfaction	n = 207 t = 6.40**	n = 207 t = 5.86**	n = 207 t = 5.61**
Frustration	.13 [-.01, .26]	.10 [-.03, .24]	.31** [.18, .43]				
Affiliation							
Satisfaction	.00 [-.13, .14]	.08 [-.05, .22]	.02 [-.12, .15]	Frustration	n = 207 t = 1.33	n = 207 t = 0.99	n = 207 t = 1.94
Frustration	.04 [-.10, .18]	.04 [-.10, .18]	.19** [.06, .32]				
fEMG-indexed contingencies							
Power game							
Satisfaction				Games			
Zygomatious	.01 [-.13, .15]	-.01 [-.14, .13]	-.04 [-.18, .10]	Satisfaction Zygomatious	n = 199 t = 0.49	n = 199 t = 0.53	n = 199 t = 1.34
Corrugator	-.01 [-.15, .13]	.00 [-.14, .13]	-.08 [-.21, .06]	Corrugator	n = 199 t = -0.44	n = 199 t = -0.27	n = 199 t = -1.47
Frustration	-.16* [-.29, -.02]	-.20** [-.33, -.06]	-.17* [-.30, -.03]				
Zygomatious				Frustration Zygomatious	n = 199 t = 0.49	n = 199 t = -0.28	n = 199 t = -1.51
Corrugator	.09 [-.05, .22]	.03 [-.11, .17]	.04 [-.10, .18]	Corrugator	n = 199 t = -0.45	n = 199 t = -0.28	n = 199 t = -1.51
Power imagination							
Satisfaction				Imagination Satisfaction	n = 198 t = -0.70	n = 198 t = -1.68	n = 199 t = 0.92
Zygomatious	-.05 [-.19, .09]	-.10 [-.24, .04]	.06 [-.08, .20]	Zygomatious	n = 198 t = -0.57	n = 198 t = -0.62	n = 198 t = -1.69
Corrugator	.04 [-.10, .18]	-.01 [-.15, .13]	-.09 [-.22, .05]	Corrugator	n = 198 t = 0.02	n = 198 t = -0.80	n = 198 t = 1.26
Frustration	.00 [-.13, .14]	-.07 [-.20, .07]	.11 [-.03, .25]				
Zygomatious				Imagination Satisfaction	n = 198 t = -0.70	n = 198 t = -0.62	n = 198 t = -1.69
Corrugator	.08 [-.06, .22]	.07 [-.07, .20]	-.08 [-.22, .06]	Zygomatious	n = 198 t = -0.57	n = 198 t = -0.62	n = 198 t = -1.69
Power images							
Satisfaction				Corrugator	n = 198 t = -0.57	n = 198 t = -0.62	n = 198 t = -1.69
Zygomatious	-.05 [-.19, .09]	-.06 [-.20, .08]	-.13* [-.27, .01]	Corrugator	n = 198 t = 0.02	n = 198 t = -0.80	n = 198 t = 1.26
Corrugator	-.14 [-.27, .00]	-.07 [-.21, .07]	-.02 [-.16, .12]				
Frustration				Frustration Zygomatious	n = 198 t = 0.02	n = 198 t = -0.80	n = 198 t = 1.26
Zygomatious	.02 [-.12, .15]	.04 [-.10, .18]	.03 [-.11, .17]	Corrugator	n = 198 t = 0.35	n = 198 t = 0.19	n = 198 t = -0.83
Corrugator	-.10 [-.23, .04]	-.03 [-.16, .11]	-.05 [-.18, .09]				
Affiliation game							
Satisfaction				Images Satisfaction	n = 199	n = 199	n = 199
Zygomatious	-.04 [-.18, .10]	-.06 [-.20, .08]	-.18* [-.31, -.04]	Zygomatious	n = 199	n = 199	n = 199
Corrugator	.04 [-.10, .17]	.02 [-.12, .16]	.08 [-.06, .21]				
Frustration							

(table continues)

Table 2 (continued)

Index	Correlations			Correlation comparisons (power vs. affiliation)			
	Overall narcissism	Narcissistic admiration	Narcissistic rivalry	Comparison domain	Overall narcissism	Narcissistic admiration	Narcissistic rivalry
Zygomatious	-.04 [-.18, .09]	-.04 [-.18, .10]	-.15* [-.28, -.01]		<i>t</i> = 0.14	<i>t</i> = 0.20	<i>t</i> = 0.19
Corrugator	.04 [-.10, .18]	.05 [-.09, .19]	.07 [-.06, .21]	Corrugator	<i>n</i> = 198 <i>t</i> = -0.18	<i>n</i> = 198 <i>t</i> = -0.36	<i>n</i> = 198 <i>t</i> = -1.80
Affiliation imagination							
Satisfaction							
Zygomatious	.01 [-.13, .15]	.06 [-.08, .19]	-.03 [-.17, .11]	Frustration Zygomatious	<i>n</i> = 198 <i>t</i> = 0.65	<i>n</i> = 198 <i>t</i> = 0.51	<i>n</i> = 198 <i>t</i> = 0.28
Corrugator	.08 [-.06, .22]	.03 [-.11, .17]	.03 [-.11, .17]				
Frustration							
Zygomatious	.00 [-.14, .14]	.01 [-.13, .15]	-.01 [-.15, .13]	Corrugator	<i>n</i> = 198 <i>t</i> = -0.89	<i>n</i> = 198 <i>t</i> = -0.65	<i>n</i> = 198 <i>t</i> = -0.85
Corrugator	.07 [-.07, .21]	.04 [-.10, .18]	.02 [-.12, .16]				
Affiliation images							
Satisfaction							
Zygomatious	-.06 [-.20, .08]	-.08 [-.22, .06]	-.15* [-.28, -.01]				
Corrugator	-.12 [-.26, .02]	-.04 [-.18, .10]	.13 [-.01, .27]				
Frustration							
Zygomatious	-.04 [-.18, .10]	.00 [-.14, .14]	.01 [-.13, .15]				
Corrugator	-.02 [-.16, .12]	.03 [-.11, .17]	.03 [-.11, .16]				
Power behaviors	.19* [.02, .36]	.20* [.03, .37]	.06 [-.11, .24]		<i>n</i> = 123 <i>t</i> = 1.44	<i>n</i> = 123 <i>t</i> = 1.01	<i>n</i> = 123 <i>t</i> = 1.74
Affiliation behaviors	.02 [-.16, .19]	.08 [-.10, .25]	-.15 [-.32, .03]				

Note. Values in square brackets indicate the 95% confidence interval for each correlation. Correlation comparisons were conducted using the Steiger's (1980) Case A Formula for dependent correlations. The correlations of narcissism with a power index and its analogous affiliation index (e.g., correlations of narcissism with self-reported power and affiliation satisfaction reactivity) are compared while taking into account the correlation between the power and affiliation index (e.g., the correlation between self-reported power and affiliation satisfaction reactivity). fEMG = facial electromyography.

Correlations that remained statistically significant after alpha correction in robustness analyses (corrected $\alpha = .007$) are denoted in *bold*.

^aThe coefficient became statistically significant when excluding participants who responded too quickly to the questionnaires, $r = -.15, p = .034, 95\%CI [-.29, -.01]$.

* $p < .05$. ** $p < .01$.

Observed behaviors

2.0.9; Revelle, 2020) for correlation comparisons and mediation analyses.

Results

A correlation matrix including all variables of this study is presented in the Supplemental Material (Table S6).

A figure containing bivariate scatterplots with best-fit lines, histograms, and correlations of main variables is also presented in the Supplemental Material (Figure S3).

Preliminary Analyses

Consistent with prior research (Back et al., 2013), overall narcissism as assessed with the NPI was positively related to both narcissistic admiration, $r = .67, p < .001, 95\% \text{ CI } [.59, .74]$, and narcissistic rivalry, $r = .29, p < .001, 95\% \text{ CI } [.16, .41]$, with the correlation being descriptively stronger for admiration. Narcissistic admiration and rivalry were modestly positively correlated, $r = .36, p < .001, 95\% \text{ CI } [.24, .47]$. Self-reported positive and negative affective reactivity were moderately positively correlated for both power, $r = .42, p < .001, 95\% \text{ CI } [.30, .53]$ and affiliation, $r = .47, p < .001, 95\% \text{ CI } [.35, .57]$, suggesting that if individuals are affectively reactive in terms of positive affect, they also tend to be reactive in terms of negative affect per motive domain. Finally, correlations between self-reported affective reactivity and fEMG assessments of affective reactivity were not only weak but also inconsistent (e.g., power self-reports correlated with affiliation fEMG; Supplemental Material, Table S7).

Primary Analyses

Narcissism and Its Relation to Affective Contingencies

Correlations are presented in Table 2 (left half).

Power Satisfaction. We hypothesized that narcissism would be related to higher positive and lower negative affective reactivity in response to power satisfaction. We found that overall narcissism, narcissistic admiration, and narcissistic rivalry were indeed all positively related to self-reported positive reactivity in response to power satisfaction. However, we also found that overall narcissism, narcissistic admiration, and narcissistic rivalry were not significantly related to positive (i.e., zygomaticus activity) or negative (i.e., corrugator activity) muscle reactivity in response to power satisfaction across tasks. Thus, individuals with higher narcissism levels reported higher positive reactivity to power satisfaction, but such reactivity was not evident from their facial muscle activity.

Power Frustration. We hypothesized that narcissism would be related to higher negative and lower positive affective reactivity in response to power frustration. We found that narcissistic rivalry was positively related to self-reported negative reactivity in response to power frustration, whereas overall narcissism and narcissistic admiration were not. Furthermore, we found that overall narcissism, narcissistic admiration, and narcissistic rivalry were all significantly related to lower positive muscle reactivity in response to power frustration in the game, but not significantly related to such reactivity in the imagination exercise and in image presentation. Overall narcissism, narcissistic admiration, and narcissistic rivalry were also not significantly related to negative muscle reactivity (i.e., frowning)

in response to power frustration across tasks. Thus, individuals with higher narcissism levels exhibited lower positive muscle reactivity in response to power frustration in the game, yet only individuals with higher narcissistic rivalry levels reported higher negative reactivity to power frustration.

Affiliation Satisfaction. We hypothesized that overall narcissism and narcissistic admiration would not be strongly positively or significantly related to positive affective reactivity in response to affiliation satisfaction, but that narcissistic rivalry would be related to lower positive and higher negative affective reactivity in response to affiliation satisfaction. We found that overall narcissism and narcissistic admiration were not significantly related to self-reported positive reactivity to affiliation satisfaction and were also not significantly related to positive or negative muscle reactivity in response to affiliation satisfaction across tasks. Narcissistic rivalry was also not significantly related to self-reported positive reactivity to affiliation satisfaction, but it was related to lower positive muscle reactivity in response to affiliation satisfaction in the game and in the image presentation, but not in the imagination exercise. Finally, narcissistic rivalry was not significantly related to negative muscle reactivity in response to affiliation satisfaction across tasks. Thus, individuals with higher narcissism levels did not report or exhibit higher or lower reactivity in response to affiliation satisfaction, except for those with higher narcissistic rivalry levels, who did exhibit lower positive muscle reactivity in response to affiliation satisfaction in the game and in the image presentation.

Affiliation Frustration. We hypothesized that overall narcissism and narcissistic admiration would not be strongly positively or significantly related to negative affective reactivity in response to affiliation frustration, but that narcissistic rivalry would be related to lower negative and higher positive affective reactivity in response to affiliation frustration. Indeed, we found that overall narcissism and narcissistic admiration were not significantly related to self-reported negative reactivity to affiliation frustration. Overall narcissism and narcissistic admiration were also not significantly related to positive or negative muscle reactivity in response to affiliation frustration across tasks. Contrary to our expectations, however, narcissistic rivalry was significantly related to *higher* self-reported negative reactivity to affiliation frustration and to lower positive muscle reactivity in response to affiliation frustration in the game (although it was not significantly related to such reactivity in the imagination exercise and in the image presentation). Finally, narcissistic rivalry was not significantly related to negative muscle reactivity in response to affiliation frustration across tasks. Thus, individuals with higher overall narcissism and narcissistic admiration levels did not report or exhibit higher or lower reactivity in response to affiliation frustration. However, individuals with higher narcissistic rivalry levels reported higher negative reactivity in response to affiliation frustration, and also exhibited lower positive reactivity in response to affiliation frustration in the game.

Robustness Checks. Statistically significant associations of narcissism with affective reactivity indices were generally small, except for those pertinent to self-reported power reactivity, which were medium. We examined the robustness of our analyses in three ways. First, we calculated composite scores of composite scores of zygomaticus and (reverse-scored) corrugator reactivity, a method that has been sometimes used in prior research (e.g., Dufner et al., 2015, 2018; Hess et al., 2017). We adopted this method in supplementary analyses (Supplemental Material, Table S8), showing

similar results, with no differences in the statistical significance of findings.

Second, we examined whether results differed when excluding participants that were possibly responding without sufficient effort insufficient effort responding (IER) to our self-report measures (narcissism and self-reported affective reactivity). To do so, we identified outliers in the time it took to complete the questionnaires (Curran, 2016; Huang et al., 2012). Completion times were highly right-skewed as participants could save the session and continue responding at a later time, which often resulted in very long survey durations: $M = 7,610.79$ min, $SD = 25,613.02$ min, $Mdn = 50.60$ min. To zoom in on possible IER, we plotted a histogram of completion times for individuals that took less than 100 min to complete the survey. We identified five individuals that completed the survey in less than 20.24 min, a survey completion time more than 2.5 times faster than the median completion time. Following a pragmatic approach, we repeated main correlation analyses excluding these five participants, as well as two other participants with missing values on survey completion time. Results showed that no statistically significant results became nonsignificant, and that one statistically nonsignificant result became statistically significant in the same direction: In these IER analyses, narcissistic rivalry became significantly negatively associated with zygomaticus activity in response to images of power satisfaction (Table 2).

Third, we tested correlations with affective reactivity against a lower level of statistical significance, to correct for the multiple measures we used to test our hypotheses. For these analyses, we divided the alpha level by the number of reactivity measures we used (seven measures per hypothesis, one self-report and six fEMG measures), which resulted in a corrected $\alpha = .05/7 = .007$. These analyses suggested that all narcissism measures were still significantly related to self-reported positive reactivity to power satisfaction, that narcissistic rivalry was still significantly related to self-reported negative reactivity to power and affiliation satisfaction, and that narcissistic admiration was still significantly related to lower zygomaticus reactivity in response to frustrations in the power game (results denoted in bold in Table 2). All other statistically significant results became nonsignificant.

Narcissism and Its Direct and Indirect Relation to Motivated Behavior

We investigated whether narcissism was directly and indirectly related to power and affiliation behaviors in the structured interaction. Correlations of narcissism and its associated affective reactivity indices with power and affiliation behaviors are presented in Tables 2 (narcissism) and 3 (affective reactivity indices).

Power Behaviors. We hypothesized that narcissism would be directly positively related to power behaviors. We found that only overall narcissism and narcissistic admiration were directly related to a higher degree of power behaviors ($ps \leq .033$), whereas narcissistic rivalry was not ($p > .482$).

We also hypothesized that narcissism would be indirectly related to a higher degree of power behaviors via higher positive and lower negative reactivity to power satisfaction and via lower positive and higher negative reactivity to power frustration. Correlation findings suggested that only self-reported positive reactivity to power satisfaction could possibly account for the association between narcissism and power behaviors. Mediation analyses indicated that neither

Table 3

Correlations and Confidence Intervals of the Affective Contingencies Indices That Were Associated With Narcissism, With Power and Affiliation Behaviors

Affective contingencies	Power behaviors	Affiliation behaviors
Self-reported contingencies		
Power		
Satisfaction	.22* [.04, .38]	-.02 [-.20, .15]
Frustration	.12 [-.06, .29]	.03 [-.15, .20]
Affiliation		
Frustration	.04 [-.14, .22]	.09 [-.09, .26]
fEMG-indexed contingencies		
Power game		
Frustration, zygomaticus	-.04 [-.22, .15]	.11 [-.07, .28]
Affiliation game		
Satisfaction, zygomaticus	.07 [-.11, .25]	.12 [-.06, .30]
Frustration, zygomaticus	.17 [-.01, .34]	.05 [-.13, .23]
Affiliation images		
Satisfaction, zygomaticus	.01 [-.17, .19]	.16 [-.03, .33]

Note. Values in square brackets indicate the 95% confidence interval for each correlation. None of the above correlations was statistically significant after a Bonferroni alpha correction in robustness analyses (corrected $\alpha = .003$).

fEMG = facial electromyography.

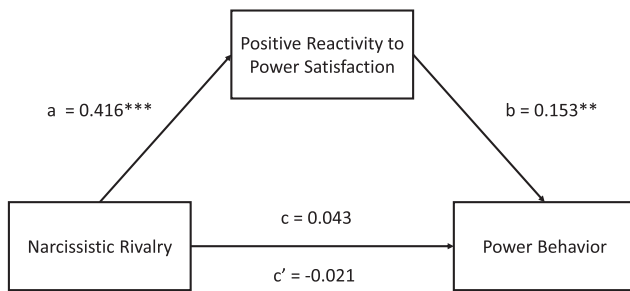
* $p < .05$.

overall narcissism, $B = 0.163$, $SE = 0.087$, 95 % CI [-0.0021, 0.3447], nor narcissistic admiration, $B = 0.046$, $SE = 0.028$, 95 % CI [-0.0051, 0.1039], were indirectly related to a higher degree of power behaviors via self-reported positive reactivity to power satisfaction. Results of partial correlation analyses suggested that removing the shared variance of overall narcissism and narcissistic admiration with positive reactivity to power satisfaction rendered correlations with power behavior statistically nonsignificant (overall narcissism: $r_{\text{narc-beh-react}} = .09$, $p = .347$, 95% CI [-.09, .26], and $r_{\text{react-beh-narc}} = .14$, $p = .131$, 95% CI [-.04, .31]; narcissistic admiration: $r_{\text{adm-beh-react}} = .10$, $p = .266$, 95% CI [-.08, .27], and $r_{\text{react-beh-adm}} = .13$, $p = .142$, 95% CI [-.04, .30].

Yet, narcissistic rivalry was indirectly related to a higher degree of power behaviors via higher self-reported positive reactivity to power satisfaction (Figure 1). The overall model with narcissistic rivalry, self-reported positive reactivity to power satisfaction, and power behaviors explained approximately 4% of variance in power behaviors, $F(2, 206) = 4.77$, $p = .003$. Narcissistic rivalry positively predicted self-reported positive reactivity to power satisfaction, $B = 0.416$, $SE = 0.058$, $t(207) = 7.23$, $p < .001$, which in turn positively predicted power behaviors above and beyond narcissistic rivalry, $B = 0.153$, $SE = 0.052$, $t(206) = 2.92$, $p = .004$, with partial $r_{\text{react-beh-riv}} = .21$, $p = .020$, 95% CI [-.03, .37]. The total effect of narcissistic rivalry on power behaviors was not statistically significant, $B = 0.043$, $SE = 0.044$, $t(207) = 0.97$, $p = .331$, and neither was the direct effect, $B = -0.021$, $SE = 0.048$, $t(206) = -0.43$, $p = .671$, with partial $r_{\text{riv-beh-react}} = -.03$, $p = .738$, 95% CI [-.21, .15]. However, there was a significant bootstrapped indirect effect: Narcissistic rivalry was indirectly related to a higher degree of power behaviors via higher self-reported positive reactivity to power satisfaction, $B = 0.064$, $SE = 0.025$, 95 % CI [0.0176, 0.1168]. Thus, to the extent that individuals with higher narcissistic rivalry reported more positive reactivity to power satisfaction, they showed more power-related behaviors.

Figure 1

Regression Coefficients for the Relationship Between Narcissistic Rivalry and Power Behavior as Mediated by Self-Reported Positive Reactivity to Power Satisfaction



Note. *a*: Effect of narcissistic rivalry on positive reactivity to power satisfaction. *b*: Effect of positive reactivity to power satisfaction on power behavior, controlling for the effect of narcissistic rivalry. *c*: Total effect of narcissistic rivalry on power behavior. *c'*: Indirect effect of narcissistic rivalry on power behavior (mediated through positive reactivity to power satisfaction).

** $p < .01$ *** $p < .001$.

Affiliation Behaviors. We hypothesized that narcissistic rivalry would be negatively related to affiliation behaviors. In contrast to this, narcissistic rivalry was, like overall narcissism and narcissistic admiration, not directly related to affiliation behaviors, $ps \geq .103$.

We further hypothesized that narcissistic rivalry would be indirectly related to a lower degree of affiliation behaviors via lower positive reactivity to affiliation satisfaction and higher negative reactivity to affiliation frustration. However, none of the affective reactivity indices significantly associated with narcissistic rivalry was significantly associated with affiliative behaviors.

Robustness Checks. In all analyses, statistically significant findings were small. We examined the robustness of these analyses in three ways. First, we used composite scores of zygomaticus and corrugator reactivity. Associations of narcissism which composite scores of zygomaticus and corrugator reactivity (Supplemental Material, Table S9) produced similar results and showed an additional, significant positive association of composite positive reactivity in response to affiliation images with affiliative behavior (confirming Dufner et al., 2015). Composite positive reactivity to affiliation images fully mediated the association between narcissistic rivalry and affiliative behavior. Second, we examined whether results for correlation analyses differed when excluding individuals that were possibly inattentively responding to the online questionnaires (similar procedure as in previous robustness check, excluding five individuals with short survey completion times and two without information on completion times). There were no changes in the results: No statistically significant results became statistically nonsignificant, and no statistically nonsignificant results became statistically significant. Finally, we tested correlations between affective reactivity indices and behaviors against a lower level of statistical significance via a Bonferroni alpha correction based on the number of associations in Table 3 (corrected $\alpha = .05/14 = .003$). Based on this correction, the one statistically significant association became nonsignificant, suggesting that the mediation analysis we performed

would not have been warranted using a lower level of statistical significance. We did not perform alpha correction in correlations between narcissism and behaviors as only a single analysis was conducted per hypothesis.

Narcissism and Its Asymmetrical Relation to Power and Affiliation

We explored whether narcissism was more systematically related to higher power reactivity and behavior than to affiliation reactivity and behavior. We did so by comparing the correlations of narcissism with similar power and affiliation indices (e.g., self-reported positive reactivity toward power satisfaction vs. toward affiliation satisfaction) using the Steiger Case A Formula (Steiger, 1980) for comparing two dependent correlations (Table 2, right half). The analyses suggested that overall narcissism, narcissistic admiration, and narcissistic rivalry were all more strongly related to self-reported positive reactivity toward power satisfaction than toward affiliation satisfaction. All other comparisons were statistically nonsignificant.

Discussion

The present study is the first systematic investigation of the affective contingencies of narcissism. Building on motivational theories of narcissism and combining subjective reports with physiological assessments, we hypothesized that narcissists, in comparison to individuals lower in narcissism, would have stronger affective contingencies in the power, but not in the affiliation domain. We also examined whether these contingencies would partly account for narcissists' interpersonal behavior. Our findings showed that narcissism is marked by relatively strong contingencies with regard to power satisfaction, but not to affiliation, with one exception: Narcissistic rivalry is also marked by relatively strong affective contingencies with regard to both power and affiliation frustration. Contrary to our hypothesis, affective contingencies did not systematically account for the link between narcissism and interpersonal behavior. Our findings were more consistent and robust with regard to self-reported rather than to physiologically assessed affective contingencies, where many null associations emerged. Taken together, these results suggest that narcissism is characterized by a distinct profile of affective contingencies toward experiences of power and affiliation.

Narcissism and Affective Contingencies

Our research was inspired by motive disposition theory (McClelland, 1987) and informs understanding of the building blocks of personality. By demonstrating that narcissism is linked to a specific set of affective contingencies, our findings lend support to theories positing that personality traits are associated with distinct affective "if ... then" contingencies that become activated in response to specific environmental triggers (Denissen & Penke, 2008; Geukes, van Zalk, et al., 2017; Mischel & Shoda, 1995; Morf, 2006, 2006; Morf & Horvath, 2010; Wrzus & Roberts, 2017). Our findings illustrate how trait levels are linked to inter-individual differences in affective responses to circumscribed situations (e.g., narcissists experience more pleasure when gaining power than nonnarcissists), as well as to intra-individual profiles of

affective responses across different situations (e.g., narcissists experience increased pleasure when gaining power, but not when feeling included). Thus, our findings suggest that individual differences in motive-specific affective contingencies may partly underlie individual differences in personality traits.

Our findings contribute to knowledge about the types of social dynamics that narcissists prefer. Social dynamics can, in broad terms, either take the form of social closeness with others (affiliation) or the form of social influence over others (power), and the two are not mutually exclusive (Hogan, 1983; Leary, 1958; 1987; Wiggins, 1995). Yet, consistent with narcissism theories (Baumeister & Vohs, 2001; Campbell & Green, 2008; Campbell et al., 2006; Grapsas, Denissen, et al., 2020; Johnson et al., 2012; Mahadevan et al., 2016; Morf & Rhodewalt, 2001; Zeigler-Hill, McCabe, et al., 2018), our most robust findings indicated that, generally, narcissists do not uniformly enjoy both forms of social dynamics, but primarily those associated with power. Notably, narcissists (except those high in rivalry) did not appear especially negatively reactive to power frustrations. We suspected that narcissists would be less likely to admit such vulnerability in self-reports, though this lack of negative reactivity was also largely evident in the lab: Findings showing decreased enjoyment in response to power frustrations emerged only in fEMG reactivity in the power game and were not robust when the adjustment for multiple testing was made. Taken together, these findings suggest that narcissists are strongly driven to pursue power and are, on average, not likely to be discouraged when they are powerless. This affective reactivity profile might be the reason that narcissists have been described as “pervasive” (Grapsas, Brummelman, et al., 2020, p. 152) and “unmitigated” (Bradlee & Emmons, 1992, p. 830) in their power pursuit. Thus, by showing how narcissists affectively react toward power and affiliation satisfactions and frustrations, our findings elucidate how narcissists prefer to relate to others, and why this preference might be especially salient.

Our study advances knowledge about the affective contingencies of narcissism in three ways. First, it shows that these contingencies have a dual nature. There was little evidence of convergence between trait reactivity and fEMG reactivity measures (though there was some convergence between fEMG and post-task affect measures, which seems to suggest that, when asked directly after their momentary affective experiences, people might more accurately report these experiences; see Mauss & Robinson, 2009 for a review). Thus, whereas some affective contingencies can be conscious and accessible via self-reports, others can be more automatic or even unconscious. Theorists have proposed that explicit affective contingencies are more closely connected to self-reported goals, values, and motives, whereas automatic or implicit affective contingencies are more closely connected to biological reward systems (Schultheiss et al., 2012). The dual nature of affective contingencies associated with narcissism suggests that different psychological and physiological processes might contribute to narcissistic behavior across different types of motive-relevant experiences. However, it should be noted that our physiology findings were less robust than self-reports, revealing null associations that were often contrary to our hypotheses.

Second, our findings advance understanding of how narcissists' affective contingencies operate. Consistent with motive disposition theory (McClelland, 1987), our findings showed that, on average, reactivity to motive *satisfaction* is positively linked with reactivity

to motive *frustration*, suggesting an underlying pattern of general reactivity to motive-relevant experiences. However, for some people this was not the case: Individuals higher in narcissistic rivalry exhibited attenuated reactivity toward satisfying experiences of affiliation (as shown by fEMG findings, which were notably less robust) but pronounced, rather than attenuated, reactivity toward frustrating experiences of affiliation.

Third, our findings suggest that affective contingencies did not consistently account for narcissists' behavior. A conceptual explanation could be that affective contingencies might indicate a lower threshold for motive-relevant behaviors to emerge, yet that threshold might not be easily reached in contexts without pronounced motive salience (e.g., in the absence of competition; cf. Morf & Horvath, 2010). A methodological explanation could be that this finding is explained by the reduced sample size pertaining to the behavioral data, as well as by the relatively low temporal stability of fEMG-indexed affective contingencies (Hess et al., 2017).

Narcissistic Admiration and Rivalry

Our findings highlight the value of studying the differences between narcissistic admiration and rivalry to unravel the affective correlates of narcissism. Our findings were virtually identical for overall narcissism and narcissistic admiration, suggesting that narcissistic admiration reflects the most frequently measured and prototypical features of narcissism (the narcissistic “default” mode; Back, 2018; Grapsas, Brummelman, et al., 2020; Wetzel et al., 2016). Findings for narcissistic rivalry were partly different, as they revealed a profile of higher reactivity to power satisfaction but also a higher reactivity to both power and affiliation frustration. Rivalrous narcissists might be especially power-driven as their affective life hinges strongly on both power satisfactions and frustrations. At the same time, rivalrous narcissists might also be less affiliative or even hostile, as they not only derive attenuated pleasure from affiliation satisfactions (as shown by fEMG findings, which were less robust), but also show more negative reactivity to affiliation frustrations. Scholars have often characterized narcissists as less affiliative (Brummelman, Gürel, et al., 2018; Grapsas, Brummelman, et al., 2020), yet our findings suggest that this description best fits individuals with higher levels of narcissistic rivalry. Thus, similarities in power satisfaction reactivity between narcissistic admiration and rivalry are consistent with the proposition that an underlying power motive ties them together as manifestations of narcissism (Grapsas, Brummelman, et al., 2020). The differences in power and affiliation frustration reactivity between them, however, are consistent with the proposition that narcissistic rivalry corresponds to a tendency for narcissistic self-protection (Back, 2018; Back et al., 2013), which goes hand-in-hand with affective vulnerability to broader social motive frustrations, including affiliation (see also Subramanian et al., 2020). Thus, affective contingencies reveal both similarities and differences between narcissistic admiration and rivalry.

Narcissism and Affective Experiences

Our findings also provide insight into the emotional life of narcissists. On average, narcissists tend to experience positive emotions (see Czama et al., 2018 for a review), yet findings show that they also experience emotional turmoil. Prior work has

revealed, for example, that narcissists tend to show increased stress when under social evaluation (Brummelman, Nikolić, et al., 2018; Grapsas, Denissen, et al., 2020; Reinhard et al., 2012); are prone to experiencing shame, anger, and aggression in the face of failure (Denissen et al., 2018; Kjærviik & Bushman, 2021; Thomaes, Bushman, et al., 2008—but see Kirkpatrick et al., 2002); and show bouts of vulnerability (Edershile & Wright, 2020) and fluctuations in self-esteem based on the power they have in their daily lives (Geukes, Nestler, et al., 2017; Zeigler-Hill, Vrabell, et al., 2018). Our findings suggest that narcissists' affect might oscillate depending on which of their social motives becomes satisfied or frustrated. We propose that researchers should shift the focus from what narcissists generally feel to what determines how narcissists feel in any particular moment. This dovetails with dynamic models of narcissism (Back, 2018; Grapsas, Denissen, et al., 2020; Morf & Rhodewalt, 2001) and personality (Fleeson & Jayawickreme, 2015; Geukes, van Zalk, et al., 2017; Mischel & Shoda, 1995; Morf, 2006; Wrzus & Roberts, 2017), which suggest that trait-like tendencies reflect frequently recurring states that emerge in person–environment transactions. For example, a recurring sense of having power might generate recurring states of increased pleasure in narcissists, which in turn might come across as an average tendency to experience positive affect. In situations when this perception is threatened, however, negative emotions like anger or anxiety might occur. Moving from general affective and emotional tendencies (i.e., how narcissists generally feel) to motive-relevant, situationally specific affective and emotional experiences (i.e., which situations make narcissists feel the way they do) can enhance our understanding of narcissists' well-being and its determinants.

Societal Implications

Research has shown that narcissism is associated with pressing social problems, such as aggression, violence, and toxic leadership behavior (see Denissen et al., 2018; Grijalva et al., 2015; Kjærviik & Bushman, 2021; Sedikides & Campbell, 2017 for reviews). Although our work is not designed to address such social problems, our findings do support a theoretical model that can inform ways to reduce harmful effects of narcissism within narcissists' social environments. The pursuit of power is theorized to unfold in a sequence of processes: Selecting a situation that affords power, attending to power-related cues, appraising whether one can attain power, and taking action to attain power (see Grapsas, Brummelman, et al., 2020; Morf & Horvath, 2010). Interventions can target each of these processes. For example, workplaces can incentivize collaboration over competition, make power-related cues less salient (e.g., highlight collective rather than individual achievements), encourage employees to interpret feedback as opportunities for growth rather than a threat to their power, and offer employees the means to pursue power in socially adaptive ways (e.g., by assigning them a leadership position to facilitative within-group collaboration in the service of between-group competition). More broadly, interventions can inform narcissists about the potentially undesirable interpersonal consequences of the unmitigated pursuit of power (e.g., decrease in status and likeability and a reputation of low affiliation; Carlson & DesJardins, 2015; Imhoff & Koch, 2017; Küfner et al., 2013; Leckelt et al., 2015; Scopelliti et al., 2015). Of course, these are not ready-to-implement interventions. As power is a fundamental human motive (Anderson

et al., 2015; McClelland, 1987), such interventions might backfire if they are designed in a way that frustrates power pursuit altogether. Thus, potential interventions should be investigated through rigorous randomized controlled trials. An important avenue for future research will be to conduct such trials.

Strengths, Limitations, and Future Research Directions

Our study has several strengths. First, we brought together long-held assumptions about the contingencies underlying personality with contemporary motivational theories of narcissism, thus adopting a theoretical framework that applies to broader personality research. Second, we studied this integrative theoretical framework in a systematic way, using a multidimensional assessment of narcissism, subjective and physiological assessments of affective contingencies across a range of paradigms, and an ecologically valid assessment of real-life social behavior. Third, we examined the validity of our tasks and the robustness of our findings in multiple ways to minimize capitalizing on chance findings.

However, our study also has limitations. First, there are limitations regarding our fEMG measures of affective contingencies. Some of our physiological reactivity indices demonstrated low reliability and poor convergent validity with self-reports of affective reactions in the lab. These measurement limitations complicate the interpretability of some results and might have even been the reason for some of our null findings. Future studies should replicate our findings and seek even more reliable assessments of affective contingencies (e.g., by increasing the number of items or events; cf. Dufner et al., 2015, 2018). For example, based on the Spearman–Brown prophecy formula, the reliability of our least reliable fEMG index (zygomaticus reactivity toward images of power frustration) could be improved from .21 to .70 by increasing the number of items from four to nine. Yet, the number of items is but one path toward constructing reliable measures. For example, a possibility for the low reliability of the power-related images might be that some of the pictures might have evoked negative reactions, as participants did not identify with the powerful persons displayed (which was our intention) but felt threatened by them (which would especially be unpleasant for power-driven individuals like narcissists; cf. Schultheiss & Hale, 2007). In such a case, a pattern of mixed affective reactions might have emerged, which lowered the reliability of our power images. Future studies should ensure that participants identify with images representing power, for example, by creating personalized stimuli, in which participants' own face is superimposed in people with and without power.

A second limitation of our study pertains to our measurement of behavior. Although our study was highly powered to examine the association between narcissism and affective contingencies, it had relatively low power for examining the link between narcissism and social behavior, which could lead to unstable coefficients (Schönbrodt & Perugini, 2013). Our results were generally consistent with prior work that found a relation between overall narcissism and narcissistic admiration with power-related behavior (Back et al., 2010; Holtzman et al., 2010). We call for well-powered replications.

A final limitation is that our study was not designed to address causally the relationships we tested via mediation analyses. Although we measured narcissism and affective contingencies prior to behavior, our study did not include random assignment or repeated measures, which would allow drawing causal inferences

from our mediation analyses (Bullock et al., 2010; Giner-Sorolla, 2016). Therefore, our mediation analyses only tested mediation statistically, not causally. Furthermore, our mediation analyses were conducted based on the hypothesis that narcissism is linked to affective contingencies that in turn motivate behavior (i.e., narcissists partly behave the way they do because they exhibit these contingencies). We note that this grouping is not the only way to group these variables. An alternative causal model would have been possible, based on the idea that affective contingencies influence narcissism, which in turn influences behavior (this would result in analyses with affective contingencies as predictors and narcissism a mediator; for a similar reasoning, see Wood et al., 2015). Another causal model would have also been possible, positing that affective contingencies simultaneously influence narcissism and behaviors (for a discussion of different causal scenarios producing a similar empirical pattern of results, see MacKinnon et al., 2000). Either way, experimental and longitudinal studies could shed more light into potential causal pathways that link affective contingencies to personality traits and behavior.

Our findings also generate avenues for future research. Upon constructing more reliable measures of affective contingencies, future studies can examine under which conditions self-reports and physiology converge or diverge: Do they indeed tap related but distinct aspects of people's affective reactions, or do they tap independent processes? Which role does method variance play in this context? How does each of these measures relate to personality functioning, and under which conditions do these measures predict similar trait-relevant behaviors or outcomes? Findings from such studies do not only have methodological value. They can help uncover the multiple layers of motive-related processes underlying personality traits.

Future studies should also clarify the role of affective contingencies in narcissists' behavior. To examine to what extent affective contingencies are associated with narcissists' behavior across time and contexts, our behavioral follow-up was in a motive-unspecific context that was temporally detached from our assessment of affective contingencies. Future studies should examine whether affective contingencies do consistently relate to behavior if behavior is assessed in a context that is trait-relevant (Tett et al., 2013) or motive-arousing (McClelland et al., 1989). For example, they could examine whether this relationship in a context differs depending on whether the context is designed to elicit power behavior (e.g., a competition, or a task with a leader and followers) or affiliative behavior (e.g., a leaderless collaborative task, a group-bonding activity).

Moreover, future studies should investigate the origins, development, and malleability of the affective contingencies of narcissism. The literature on motivation and narcissism suggests that these affective contingencies can be both genetically transmitted and environmentally shaped (Brummelman & Grapsas, 2020; Brummelman et al., 2015; Carlson & Gjerde, 2009; Grapsas, Denissen, et al., 2020; McClelland, 1987; Vernon et al., 2008). For example, it is possible that these contingencies are at least partly shaped through social referencing by the social environment. Children might learn these reactions by parents who express intense pleasure (e.g., smile intensely) when children gain power over peers, or intense displeasure (e.g., frown intensely) when their children are powerless against peers (Assor & Tal, 2012; Brummelman & Sedikides, 2020; Grapsas, Denissen, et al., 2020). If so, then these

contingencies might be sensitive to targeted interventions (e.g., by toning down the expression of pleasure or displeasure in parents' affective reactions toward their child's power gain and loss).

Conclusion

Scholars have long assumed that narcissism is rooted in affective contingencies in the domain of power. Via a systematic, comprehensive multimethod design, we provided evidence suggestive of such contingencies. Our findings suggest that the amount of pleasure and displeasure narcissists derive from experiences of power and affiliation might help explain why narcissists tend to pursue power and why antagonistic narcissists may tend to neglect affiliation. Our findings thus support the notion that personality traits are characterized by signature affective contingencies in fundamental motive domains. This paves the way to investigate the role of affective contingencies in the development and manifestation of personality traits.

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