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“Desiring Power” Versus “Feeling Powerful”: Two Distinguishable Attributes of Influence and Agency --Manuscript Draft--

Manuscript Number:	
Full Title:	“Desiring Power” Versus “Feeling Powerful”: Two Distinguishable Attributes of Influence and Agency
Abstract:	<p>Power is a fundamental aspect of interpersonal behavior, as is the motive to pursue it. Nevertheless, few studies have effectively distinguished desire for power from possession of power, whether assessed subjectively or objectively. We report the results of four studies of community or college samples that examine the differential associations between desire for power and feeling powerful with general personality, internalizing symptoms like generalized worry, aggression, empathy, and other social functioning variables, as well as with behaviorally-assessed competitiveness and competition-related hormones (testosterone and cortisol). Our results indicate that (1) the nomological networks of desire for power and feeling powerful differ dramatically, (2) these differences are often amplified when controlling for their shared variance, and (3) conjointly measuring and analyzing these distinct facets of power allows for a more theoretically nuanced understanding of power, particularly its relations with socially harmful tendencies such as selfishness and aggression. Most prominently, our results indicate that the unique variance of feeling powerful is broadly associated with agreeableness, honesty, humility, empathy, and other aspects of harmonious interpersonal functioning, whereas the unique variance of desire for power demonstrates strong relationships with such variables in the opposite direction. Our findings suggest that theoretical discussions and measurement methods that fail to effectively distinguish between desiring power and feeling powerful will frequently lead to misleading or incomplete conclusions. In addition, our results support prior theory arguing that unsatisfied hunger for power versus relative power contentment may be a crucial and largely overlooked distinction to be pursued in future research.</p>
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Cover Letter

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Dear Dr. Kerry Kawakami, Editor-in-Chief:

We wish to submit an original research article entitled “‘Desiring Power’ Versus ‘Feeling Powerful’: Two Distinguishable Attributes of Influence and Agency” for consideration by the *Journal of Personality and Social Psychology: Interpersonal Relations and Group Processes*. We confirm that this manuscript has not been published elsewhere and is not under consideration by another journal. All authors have approved the manuscript and agree with its submission to the *Journal of Personality and Social Psychology: Interpersonal Relations and Group Processes*.

JPSP: Interpersonal Relations and Group Processes frequently publishes important articles on the causes, correlates, and consequences of interpersonal power (and related constructs like prestige, dominance, status, and hierarchy). In this article, we demonstrate that research regarding power-related constructs should aim to distinguish between and *conjointly analyse* both “having” and “wanting” aspects of power. Across 4 studies, using a range of measurement methods and dependent variables, we demonstrate that these two constructs are (a) meaningfully distinguishable, (b) cooperatively suppress one another’s relations with a range of external variables, and (c) studies that fail to effectively distinguish between them will often generate misleading or incomplete conclusions. Our results also lend significant support to extant theories proposing that the gap between how much power an individual desires compared with how much power he or she feels she possesses, a concept we discuss in terms of “power contentment” versus “hunger for power”, may be critically valuable in understanding the relationships between power and interpersonal relations. Table 7 in this manuscript particularly highlights this distinction, in a summarized manner. We believe that this manuscript will be of serious interest to researchers interested in power-related constructs, and also has important implications for interpersonal research more broadly, such as research and theory within the “Big 2” model of Agency and Communion.

We have no conflicts of interest to disclose. Our four supplemental tables provide readers with information about the nomological networks of power-related variables that were not the focus of our article, but which may be important to some readers. Please address all correspondence concerning this manuscript to Brett A. Murphy at bmurpy.psych@gmail.com.

Thank you for your consideration of this manuscript.

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“Desiring Power” Versus “Feeling Powerful”:
Two Distinguishable Attributes of Influence and Agency

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Running Head: DESIRING POWER VERSUS FEELING POWERFUL

“Desiring Power” Versus “Feeling Powerful”:

Two Distinguishable Attributes of Influence and Agency

Abstract

Power is a fundamental aspect of interpersonal behavior, as is the motive to pursue it. Nevertheless, few studies have effectively distinguished *desire* for power from *possession* of power, whether assessed subjectively or objectively. We report the results of four studies of community or college samples that examine the differential associations between *desire for power* and *feeling powerful* with general personality, internalizing symptoms like generalized worry, aggression, empathy, and other social functioning variables, as well as with behaviorally-assessed competitiveness and competition-related hormones (testosterone and cortisol). Our results indicate that (1) the nomological networks of desire for power and feeling powerful differ dramatically, (2) these differences are often amplified when controlling for their shared variance, and (3) conjointly measuring and analyzing these distinct facets of power allows for a more theoretically nuanced understanding of power, particularly its relations with socially harmful tendencies such as selfishness and aggression. Most prominently, our results indicate that the unique variance of feeling powerful is broadly associated with agreeableness, honesty, humility, empathy, and other aspects of harmonious interpersonal functioning, whereas the unique variance of desire for power demonstrates strong relationships with such variables in the opposite direction. Our findings suggest that theoretical discussions and measurement methods that fail to effectively distinguish between desiring power and feeling powerful will frequently lead to misleading or incomplete conclusions. In addition, our results support prior theory arguing that unsatisfied *hunger for power* versus relative *power contentment* may be a crucial and largely overlooked distinction to be pursued in future research.

Keywords: power; dominance; empathy; aggression; suppression

“Desiring Power” Versus “Feeling Powerful”:

Two Distinguishable Attributes of Influence and Agency

The term power, derived from the Latin word “potere,” which means “to be able,” has long been considered a fundamental concept in philosophy (Nietzsche, 1901/2017), psychology (Fiske, 1993; Keltner, Gruenfeld, & Anderson, 2003), and the broader social sciences (Russell, 1938/2004). A burgeoning body of literature has revealed relations between individuals’ possession of power, or feelings that they are powerful, and a wide range of both positive psychological characteristics, such as self-esteem, creativity, and authentic self-expression, as well as negative characteristics, such as selfishness, dishonesty, and objectification of others (for a review, see Guinote, 2017). In this respect, power may be something of a double-edged sword with respect to theoretically and pragmatically important psychological outcomes. It is not clear, though, whether these positive and negative correlates and potential consequences of power are “twigs off the same branch,” emerging from the same underlying dimension, or whether they emerge from distinguishable aspects of social influence and agency.

As pointed out by Johnson, Leedom, and Muhtadie (2012), one major limitation of this literature is that individual differences in *desire* for power have not generally been measured and analyzed conjointly alongside of *possession* of power, whether assessed subjectively or objectively. Although most research has tended to inadvertently conflate these two constructs, often in terms of trait “dominance” or “social potency” (e.g., Baker, Larson, & Surapaneni, 2016; Mehta et al., 2015; Patrick, Curtin, & Tellegen, 2002), there are compelling theoretical and practical reasons to consider these two aspects of social influence and agency as meaningfully distinguishable. Some highly powerful people have a relatively weak yearning for power, and

vice versa. A person who has acquired enough power to feel contentedly secure may have a substantially different psychological profile than a person who has achieved the same degree of power but remains power-hungry. A person who is content with his or her power may be particularly at ease with others and less likely to see them as potential threats; in contrast, a person who is hungry for additional power may be more likely to see others as rivals, as tools to manipulate, or as obstacles to be surmounted.

The four studies described in this manuscript distinguish *wanting* from subjectively *having* power (i.e., feeling powerful), and examine their associations with personality, psychopathology, and interpersonal behavior. Specifically, in order to evaluate the extent to which the two constructs diverge in their nomological networks, we examined their relations with: general broadband personality dimensions; narrower dimensions of interpersonal functioning, including aspects of harmonious interpersonal interactions, such as empathy and adult attachment, as well as antagonistic aspects, such as aggression and entitlement; narrower dimensions of emotional distress, such as generalized anxiety and depression; and, finally, behavioral indices of competitive drive, which we conceptualize as a manifestation of desire for power. Additionally, we tested predictions derived from prior theory (e.g., Johnson et al., 2012; Shaver, Segev, & Mikulincer, 2011) that the gap between how much power a person feels s/he has compared with how much s/he desires to have, relative “*power contentment*” (having but not wanting) and unsatisfied “*hunger for power*” (wanting but not having), will provide empirical and theoretical value that is not adequately captured by considering either construct in isolation.

In turn, we argue that (1) the nomological networks of desiring power and feeling powerful differ dramatically, (2) these differences are amplified when controlling for their shared variance, and (3) accounting for the difference between these distinct experiences of power

substantially alters theoretical perspectives on power, such as its commonly presumed associations with selfish, dishonest, and/or antagonistic behavior.

Conceptualizing and Measuring Power

Power has frequently been described as inherently social, encompassing such interpersonal phenomena as the ability to compel others to do something (Dahl, 1957) or the ability to modify the behavior of others using punishments and rewards (Keltner et al., 2003). Although most of these socially-bounded definitions emphasize the ability to influence others, some have focused on the ability to act without being influenced by others (e.g., Lammers, Stoker, & Stapel, 2009) or have parsed power into two distinguishable parts: *influence* over others' outcomes and *autonomy* over one's outcomes (Lammers, Stoker, Rink, & Galinsky, 2016). Other researchers have defined power broadly, extending beyond purely social relationships to the general ability to accomplish goals (e.g., Shaver et al., 2011) or the "relative ability to possess and control valuable resources and outcomes" (Cai & Guinote, 2017, p. 1). In the broadest sense, power can be defined as *the ability to get or do what one wants*.

Differential access to power is thought to be the primary basis of social hierarchy, whereby possessing more or less power effectively rank orders individuals in terms of status in small social groups and broader societies (Magee & Galinsky, 2008). Status is often decided through competition, "a social interaction in which access to something valued is contested between individuals and groups" (Casto & Edwards, 2016, p. 21). As a result, one particularly salient behavioral expression of desire for power is competitiveness, the desire to gain status over others via "winning" in interpersonal contests, in which the valued resource may be no more than the feeling that one has gained social standing over another.

Research attempting to understand the social-behavioral consequences of power is inevitably limited by the methodological tools designed measure the construct/s. Self-report methods appear to be the most widely used method for examining power, dominance, and related constructs. Although a person's self-perceived sense of power is conceptualized as substantially related to his or her actual power in the world, the two constructs are not synonymous; an individual's perception of his or her power may be substantially higher or lower than his or her actual power. Nonetheless, feeling powerful is a fairly accessible psychological state that is presumably readily self-reported. Most relevant extant self-report scales, however, facially appear to conflate feeling powerful with desire for power, such as the Dominance scale of the Personality Research Form (PRF; Jackson, 1999) and the Social Potency scale of the Multidimensional Personality Questionnaire – Brief Form (MPQ-BF; Patrick, Curtin, & Tellegen, 2002). Although one self-report questionnaire, the Sense of Power Scale (SOP; Anderson et al., 2012), appears to focus only on feeling powerful, rather than conflating it with desire for power, no extant scales currently distinguish between and measure *both* feeling powerful and desire for power.

There is a separate extensive literature on the concept of 'implicit power motivation,' the degree with which an individual derives reward from having an impact on others, which is ostensibly a largely unconscious motive or drive for power (Winter, 1973). Measured using the Picture Story Exercise, a version of the Thematic Apperception Test, implicit power motive is not highly correlated with self-reported power or interpersonal dominance (Stanton & Schultheiss, 2009). Moreover, the nature of this projective technique does not allow for effectively distinguishing among feeling powerful, desire for power, and broader attention to

power dynamics. For example, someone could be more attentive to power dynamics without necessarily feeling more powerful or desiring more power.

Beyond self-reports and projective tests, power is frequently researched in psychological domains using a range of other methods, including randomly assigning participants into roles as either managers or subordinates in laboratory tasks (e.g., Guinote, 2007), priming participants by having them recall and write about specific instances when they had power over others (e.g., Galinsky et al, 2003), and perhaps most controversially, asking participants to assume “power poses” for short periods of time (e.g. Carney, Cuddy, & Yap, 2010; but see Ranehill et al, 2015). Other studies have used naturally-occurring power hierarchies, such as selecting participants from managerial and subordinate positions within organizations (e.g., Guinote & Phillips, 2010).

Together, this large body of research has indicated that heightened power may be associated with a wide range of psychological correlates, such as: heightened Behavioral Approach System activation (BAS: Gray, 1982, 1994) and reduced Behavioral Inhibition System (BIS) activation (Keltner et al., 2003), optimism (Fast, Gruenfeld, Sivanathan, & Galinsky, 2009), objectification of others (Gruenfeld, Inesi, Magee, & Galinsky, 2008), creativity (Galinsky et al., 2008), cynical attributions towards others (Inesi, Gruenfeld, & Galinsky, 2012), and selfishness (Rucker, DuBois, & Galinsky, 2011). In reviewing the expansive and diverse literature, Guinote (2017) proposed that the effects of having power could be summarized as follows: (1) power energizes and increases the frequency of thinking, speaking, and acting in areas an individual deems important; (2) power leads to greater focus on and desire for the individual’s goals; and (3) power increases motivated activity to attain those goals. Importantly, though arguing that possession of power often generates aspects of moral corruption and self-serving behavior, Guinote (2017) highlighted evidence that these relationships may be moderated

by variables such as: the stability of power dynamics, organizational or cultural contexts, moral identity, and benevolence or other predispositions. Guinote (2017) did not, however, prominently discuss potentially the most important moderator: an individual's desire for power.

Theoretical Importance of Considering both “Having” and “Wanting” Power

Individuals differ not only in how much power they objectively have or subjectively perceive themselves to have; they also differ in how much power they *desire* to have (cf. Neel, Kenrick, White, & Neuberg, 2016). Construing power as a unitary construct may conceal more fine-grained relations among power subdimensions and their correlates such that an observed relation between power and some external criterion may be due to wanting power more so than feeling powerful. For instance, zero-order correlational findings using questionnaire measures of feelings of power (e.g., Kraus, Chen, & Keltner, 2011; Anderson et al., 2012) may inadvertently reflect differences in desire for power. Priming methods intended to increase feeling powerful (e.g., Galinsky et al, 2003) may inadvertently also trigger an increased desire for power. Similarly, apparent differences among people who possess different levels of power, such as managers and subordinates (e.g., Cai & Guinote, 2017), might reflect differences in power-seeking motivation as opposed to feelings of having power. Above all, studies that conflate wanting and having power on a single measurement dimension (e.g., the PRF Dominance scale, Jackson, 1999) might be misleading.

Various theoretical perspectives on power are consistent with the proposition that *discrepancies* between individuals' desire for power and their possession of power, rather than simply the absolute level of power they experience, are likely to play a pivotal role in their emotions, cognitions, and behaviors. Johnson and colleagues (2012), for instance, highlighted the need for parsing desire for power from feeling powerful: “the affective and cognitive

repercussions of attaining— or failing to attain—power are likely to differ on the basis of a person’s level of dominance motivation... Thus, it appears crucial to consider dominance motivation and power conjointly in predicting outcomes” (pp. 694-695). Moreover, they hypothesized that the disjunction between these two elements of power may generate discomfort or other negative emotions, especially among individuals who feel less powerful than they would like to be. The distinction of these two elements of power has implications for the correlates and consequences of desire for power and feeling powerful.

In particular, Shaver, Segev, and Mikulincer (2011) proposed that when power motivation is highly activated, such as when individuals feel that their deserved power is being unduly restricted or threatened, they will tend to be emotionally agitated and more likely to perceive others as rivals or threats. In many cases, this hyper-activated power motivation will manifest in angry hostility and aggression. In contrast, Shaver et al. (2011) proposed that being satisfied with one’s level of power is likely to be accompanied by emotional calm and a more secure, generous attitude towards others. Although we do not here adopt the full model proposed by Shaver et al. (2011), which posits an evolved behavior system similar to the attachment system, our perspective has been strongly influenced by aspects of their conceptualization.

Such conceptualizations suggest that empirically distinguishing Feelings of Power (FP) from Desire for Power (DP) should reveal separable nomological networks. FP, after taking into account its shared variance with DP, should reflect how much power persons feel they have compared with how much they want, which we refer to as relative *power contentment*. In contrast, DP, once taking into account its shared variance with FP, should reflect unsatisfied *hunger for power*. In many cases, particularly in regard to interpersonal behavior variables implicated in prior theory (humility, empathic caring, aggression, etc.), FP and DP should

demonstrate cooperative suppression effects with one another, with their respective validity coefficients strengthening *in opposite directions* after controlling for one another (for further discussion, see Methods in Study 1). Given that the unique variances may capture more than just contentment and hunger for power, respectively (e.g., error variance, construct-irrelevant variance; Lynam, Hoyle, & Newman, 2006; Verona & Miller, 2015), analyses highlighting convergent and discriminant validity with theoretically relevant measures are needed to establish that the unique variances indeed represent these distinct constructs. This paper represents a first attempt to identify distinct nomological networks for unique variances of FP and DP.

This basic framework generates a range of broad hypotheses to be examined in the present studies, with implications not only for the gaps between an individual's perceived power and desired power, but for effective research measurement in general. Though these hypotheses are framed in terms of the unique variances of FP and DP, conceptualized as *power contentment* and *hunger for power*, we expect that they will also broadly hold, although more weakly, in terms of the zero-order associations of FP and DP with other construct variables.

Hypothesis 1: The unique variance of FP (power contentment) will be associated with more generous and harmonious interpersonal behavior; whereas the unique variance of DP (hunger for power) will be associated with interpersonal negativity, conflict, and self-serving behavior. Specifically, the variance unique to having power should be negatively associated with aggressiveness, selfishness, and other constructs related to power-seeking, but positively associated with empathic caring, attachment security, and other constructs related to harmonious interpersonal behavior (i.e., agreeableness, honesty, humility). We hypothesize, in contrast, that variance unique to desire for power should display the mirror-image pattern of relations with these constructs.

Hypothesis 2: The unique variance of FP will be associated with emotional satisfaction and psychological well-being, whereas the unique variance of DP will be associated with emotional distress and dysregulation. We hypothesize that the variance unique to having power should be negatively associated with anxiety, depression, and broader negative emotionality, whereas DP's unique variance should be positively associated with these constructs.

Hypothesis 3: The unique variance of FP will be associated with reduced competitiveness, at a trait level as well as within the context of a competitive situation, as power-satisfied individuals have less of a need to prove themselves to others. The unique variance of DP, however, should be associated with increased competitiveness. These differential associations with competitiveness should be reflected in hormonal levels in the context of a competition, with FP's unique variance being related to lower testosterone and cortisol, biological markers of competitiveness and stress, respectively.

Present Studies

In Study 1, we relied on an undergraduate participant sample to generate a new multi-dimensional self-report measure of power, examine its convergent validity with existing widely-used power measures, and investigate our hypotheses outlined earlier. In Study 2, we relied on an online community sample to confirm the factorial validity of our new scales and examine their convergent and discriminant validities. We then investigated our first and second hypotheses by examining the scale's relations with aggression, emotional wellbeing, and general personality traits related to interpersonal functioning (e.g., trait agreeableness). In Study 3, we relied on another online community sample to: introduce an alternative picture-based, as opposed to text-based, method for assessing desire for power and feelings of power; further examine the factorial validities and convergent and discriminant validities of our new scales; and further investigate

our first and second hypotheses. In Study 4, we relied on an undergraduate sample to examine our third hypothesis by assessing our scales' relations with trait competitiveness, as well as with behavioral performance, testosterone, and cortisol in the context of a competitive will paradigm.

Study 1: Development of Self-report Power Scales

To test these hypotheses in large samples, we first aimed to create a concise and readily administered self-report measure that contains distinguishable having and wanting power scales. After generating these scales, we examined their construct validity and nomological networks.

Methods

Item generation and selection. The first and fifth authors, in collaboration with others (see Acknowledgements), generated a set of candidate items for each of the following domains: feelings of having power (FP); desire for power (DP); and a third dimension of power that has received little attention, namely, attention to power cues/dynamics in the social environment (AP). The AP construct, which is not a focus of this current article, was influenced by the hypothesis of Johnson and colleagues (2012) that attention to power and dominance cues in one's environment constitutes an important aspect of the psychology of power and dominance (comprehensive information regarding the AP scale is provided in the supplemental materials).

This item generation process yielded a total of 72 candidate items. We aimed to generate a broad, comprehensive set of items (cf. Loevinger, 1957) that potentially directly related to our theoretical dimensions, erring on the side of over-inclusivity at the outset and using factor analysis to reduce the content domains of the items (cf. Clark & Watson, 1995). We also aimed to include a large number of negatively coded (reverse-worded) items, to potentially allow us to combat response acquiescence (but note that doing so frequently causes difficulties in factor analyses, e.g., Kam & Meyer, 2015). Respondents answered each item using a 6-point Likert

scale (ranging from “Disagree Strongly” to “Agree Strongly”), with no neutral option to avoid the issue of central tendency.

Sample characteristics. Study approval was obtained from the XXXX Institutional Review Board (IRB). A sample of 272 undergraduate students participated for partial course credit. The sample was 57.6% female, with a mean age of 19.4 years ($SD = 1.48$, range = 18 to 28). The ethnicity of the sample was: Caucasian, 40.9%; Asian, 37.5%; Hispanic, 12.4%; African-American, 3.5%; Mixed-Ethnicity, 2.7%; and Other, 3.1%.

Measures

Convergent validity. We administered the Sense of Power Scale (SOP; Anderson et al., 2012), the Dominance scale of the Personality Research Form (PRF; Jackson, 1967, 1999), the Social Potency scale of the Multidimensional Personality Questionnaire – Brief Form (MPQ-BF; Patrick, Curtin, & Tellegen, 2002) and the General Self-Efficacy scale (GSE; Schwarzer & Jerusalem, 1995). The SOP ($\alpha = .80$) is an 8-item scale intended to measure how powerful an individual feels, with items that assess feeling powerful rather than desiring power. These SOP items were included in the item pool for the FP and DP scales; the FP scale, which ended up including two SOP items, should be regarded as a modest revision of the SOP scale, designed with the intention of reducing overlap with and directly distinguishing from DP. We employ these items with the permission of the SOP designers (others wishing to also use them should similarly request permission). The SOP items were scored using the same 6-point Likert-type scale as used for the larger item pool. When the two overlapping items were dropped from the FP scale, it nonetheless correlated strongly with the full SOP scale ($r = .77$).

The PRF Dominance scale ($\alpha = .84$) is a 16-item measure that has been widely used in assessment and research (see Johnson et al., 2012), but appears from the perspective of face

validity to measure a heterogeneous mixture of feeling powerful, wanting power, and attitudes towards power. In this study, we substituted the true-false response format with the same 6-point Likert-type format used for the PDSS items and Sense of Power items. The MPQ-BF Social Potency Scale ($\alpha = .81$) is a 14-item measure that includes items related to both wanting and having social power, in addition to items related to attention-seeking; this scale was administered to only 168 participants. The GSE scale ($\alpha = .91$) contains 10 items assessing a subjective sense of one's own competence and ability to overcome obstacles.

External criteria. To examine the interpersonal correlates of our newly developed power scales, we administered the Buss-Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992), the Interpersonal Reactivity Index (IRI; Davis, 1983), and the Experiences in Close Relationships Scale – Revised (ECR-R; Fraley, Waller, & Brennan, 2000). The BPAQ, which Shaver et al. (2011) proposed is strongly conceptually related to excessive activation of power-seeking motives, yields four subscale scores: Physical Aggression ($\alpha = .86$); Verbal Aggression ($\alpha = .73$); Anger ($\alpha = .82$); and Hostility ($\alpha = .60$). The IRI and ECR-R both relate to our hypothesis that power contentment will be associated with more generous and trusting interpersonal connections. The IRI is a multidimensional measure of trait empathy that yields 4 distinguishable scales. Of the four, however, only the Empathic Concern scale ($\alpha = .77$) and Perspective-Taking ($\alpha = .73$) scale should be interpreted as valid measures of the empathy construct; the Fantasy and the Personal Distress scales do not generally reference the presence of other people and appear to be more conceptually related to constructs such as absorption and neuroticism, respectively (Murphy et al., 2018). The ECR-R is composed of two scales: attachment anxiety ($\alpha = .80$), which measures how much individuals worry that they might lose their relationships or might not really be loved by their partners, and attachment avoidance ($\alpha =$

.94), which measures the extent to which individuals avoid emotional intimacy with or emotional reliance upon partners.

We also administered the Borderline Features scale of the Personality Assessment Inventory (PAI-BOR; Morey, 1991) as a psychopathology measure related to emotional distress and dysregulation. The PAI-BOR measures the emotional, interpersonal, and behavioral dysregulation associated with borderline personality disorder (BPD) and yields a total score ($\alpha = .88$). Although BPD is generally conceptualized as a multi-dimensional construct, the psychometric properties of the PAI-BOR indicate that it is best regarded as unidimensional (Jackson & Trull, 2001). We included BPD features given that we predicted they would be particularly reflective of “hunger for power,” manifesting partly as anxious attempts to control others to minimize one’s own emotional distress.

Correlational and mediation analyses. To account for the multiplicity of tests conducted, we highlight correlations significant at $p < .001$ but also reference findings at $p < .01$. To yield the unique nomological networks of FP and DP after accounting for their overlap, we regressed the FP variable onto the DP variable and saved the standardized residuals, and vice-versa. This regression approach, although marked by limitations in reliability (Caruso, 2004; Malgady & Colon-Malgady, 1991), is generally preferable to difference scores in which summary scores of one dimension are subtracted from the other (Edwards, 1994). Nonetheless, as discussed earlier, the degree of fidelity of the residual variables to the theoretical model, *power contentment* versus *hunger for power*, must be critically evaluated in terms of convergent and discriminant validity.

Statistical suppression is equivalent to mediation, with the difference being that, in suppression situations, a suppressor variable is one which increases the predictive validity of

another variable when included in a regression equation, whereas a mediator variable decreases the predictive validity of the other variable (MacKinnon, Krull, & Lockwood, 2000). In some cases, referred to as “cooperative suppression,” two variables can mutually serve as suppressors to one another, with both of their predictive validities strengthening when both are included in a regression equation predicting another variable. Also in some cases, suppression can operate to not simply increase the validity coefficient, but to change its direction (e.g., a variable that was positively associated with a criterion becomes negatively associated with it once the suppressor variable is included in the regression equations). Suppressor variables are rare, and frequently difficult to replicate, but, when they are robust, they are of strong substantive import and can demonstrate the conceptual value of distinguishing between related variables (e.g., guilt and shame, Paulhus, Robins, Trzesniewski, & Tracy, 2004).

In investigating potential suppression effects of FP on DP, and vice versa, in relation to external variables, we conducted bootstrapped mediation tests using the PROCESS macro in SPSS (Hayes, 2012) with bootstrapped samples of 1000 and their 99% confidence intervals. To limit the number of mediation tests, in examining potential suppression effects, we analyzed cases only in which (a) the residual variable (e.g., FP after covarying for DP) displayed a statistically significant relationship at a $p < .01$ level with the external criterion under investigation and (b) the residual’s correlational relationship was stronger than the raw variable’s (e.g., FP without covarying for DP) relationship with the external variable. In determining statistical significance and effect sizes, we examined the completely standardized indirect effects, alternatively referred to as the “index of mediation” by Preacher and Hayes (2008), and their 99% confidence intervals.

Hypotheses

Consistent with the theoretical perspective of Shaver et al. (2011), we hypothesized that, in comparison with one another, FP would be more associated with feelings of well-being, confidence, and healthy interpersonal connection, whereas DP would be more associated with aggression and emotional unease. We hypothesized that these differential correlates would be more pronounced when examining residual variables (power contentment and hunger for power).

Results

Exploratory factor analyses. To generate preliminary scales, we employed principal axis factoring with promax rotation in SPSS; an oblique rotation was used given that we anticipated the power subdimensions to be positively intercorrelated. Visual inspection of the scree plot indicated a 2 to 5 factor solution.¹ We, therefore, examined factor loadings in 2-factor, 3-factor, 4-factor, and 5-factor models. In the 5-factor model, only three items loaded above .5 on the 5th factor; all three items were reverse-worded items related to attention to power cues in others (e.g., “I am not very good at knowing which people can be easily dominated”). Similar items that were not reverse-worded loaded together on the second factor, potentially indicating that wording method complicated the factor structure of the overall item pool. In the 4-factor model, only two items loaded above .5 on the 4th factor. These two items were also among the three items that loaded above .5 on the 5th factor in the 5-factor model; similarly, the 2nd factor was characterized by positively coded (not reverse-worded) items of similar content. In the 3-factor model, 13 items loaded above .5 on the 3rd factor.

Given that the 3-factor solution did not produce factors that appeared to be reliant upon wording method, and was also the only factor solution in which a considerable number of items loaded above .5 on at least each factor, we concluded that the item covariance structure was most consistent with three latent dimensions.² The first factor was characterized overwhelmingly by

items generated to assess feeling powerful (FP; e.g., “I don’t have much power compared to other people”), the second by items generated to assess attention to power (AP; e.g., “I try to quickly figure out which people have a lot of influence”), and the third by items generated to assess desire for power (DP; e.g., “I have a strong drive to get power”).

To select items for use in our scales, we primarily examined the structure matrix (which is typically more replicable across studies than the pattern matrix, and better illustrates high cross-loadings) in the 3-factor solution and selected items that loaded above .6 on each factor, but less than .5 on other factors. Our decision to employ a high factor-loading threshold for item selection, compared with other benchmark recommendations (e.g., .5 threshold; Costello & Osborne, 2005), was based on the need to minimize construct-irrelevant variance in the respective scales, potentially allowing for the unique variances of FP and DP to better represent *power contentment* and *hunger for power*. Almost all of these selected items also loaded above .6 on their respective factors in the pattern matrix, though a few only loaded above .5. Although our threshold for allowing cross-loadings was more lenient than benchmarks recommended by some others (e.g., a cutoff of .32 for cross-loadings, Tabachnik & Fidell, 2001), we chose it as (a) we expected a high degree of association between FP, DP, and AP, and (b) choosing a stricter cutoff threshold would have eliminated too many of our available items to allow for adequate scales. Nonetheless, among items retained, cross-loadings in the structure matrix, in all cases, accounted for less than 54% as much of the variance as the primary loadings. The difficulties in separating these dimensions in our EFA, despite writing the items to represent the distinguishable constructs, may help explain why extant scales have generally failed to distinguish between these domains, especially given that prior measure developers do not appear to have sought to do so at the item-generating stage.

This procedure yielded a 7-item scale measuring subjective feelings of power (FP; $\alpha = .83$), which strongly correlated with its respective EFA factor ($r = .94$), and a 6-item scale measuring desire for power (DP; $\alpha = .84$), which correlated strongly with its respective EFA factor ($r = .93$). The items for these scales are presented in Table 1, with their factor loadings.

Convergent validity. Full correlations for Study 1 variables are displayed in Table 2, for the FP and DP variables, and Supplemental Table 1, for nomological networks of Attention to Power (AP), Sense of Power (SOP), PRF Dominance, MPQ-BF Social Potency, and Generalized Self-Efficacy (GSES). The FP and DP scales were moderately correlated ($r = .39$). As predicted, the FP scale correlated highly with the SOP scale ($r = .84$) and yielded largely equivalent correlational patterns. The FP scale, the DP scale, and the SOP scale all correlated positively and substantially with the AP scale, PRF Dominance, MPQ-BF Social Potency, and GSES (r s ranged from .23 to .47).

The FP residual term was significantly correlated with PRF Dominance, MPQ-BF Social Potency, and GSES (r s ranged from .32 to .46), but not with AP. The DP residual was also significantly correlated with PRF Dominance ($r = .44$), MPQ-BF Social Potency ($r = .45$), and the AP scale ($r = .41$), but not with SOP and only weakly with GSES ($r = .16$). These findings suggest that the relation between desire for power and broader self-confidence may be attributable primarily (but not entirely) to shared variance with feelings of having power. Similarly, the relationship between feeling powerful and being attentive to power cues/dynamics may be attributable primarily to shared variance with desire for power.

Preliminary nomological networks. At the zero-order level, DP was positively correlated with all four aggression variables (r s ranged from .18 to .45), whereas FP was negatively correlated with hostility ($r = -.31$) and positively correlated with verbal aggression (r

= .23). Whereas FP was negatively correlated with attachment anxiety ($r = -.41$) and avoidance ($r = -.26$), as well as with BPD traits ($r = -.21$), DP was positively correlated with BPD traits ($r = .20$) and unrelated to attachment anxiety ($r = -.07$) and avoidance ($r = -.04$).

Turning to the residual terms, their patterns with external correlates remained largely the same, except that FP was no longer significantly associated with verbal aggression and was also positively associated with empathic perspective-taking ($r = .17$). The unique variance of DP, in contrast, was negatively correlated with both empathy variables (EC, $r = -.16$; PT, $r = -.19$). Significant suppression effects, with FP and DP suppressing one another's relationships with external variables, were observed in regard to: anger, hostility, perspective-taking, and borderline personality traits (absolute values of completely standardized indirect effects, B s ranged from .06 to .17)

Discussion

To distinguish feelings of having power (FP) from desire for power (DP), we generated scales using EFA. Preliminary evidence suggested that these scales demonstrate promising convergent validity and can be meaningfully distinguished at the zero-order level, especially in regard to interpersonal functioning, despite being substantially correlated. Furthermore, preliminary evidence of substantial cooperative (mutual) suppression effects, in which statistically controlling for each power dimension boosted the relations of the other power dimension with external criteria, supported the differential incremental value of FP and DP above and beyond each other. The residual values of FP and DP, after controlling for their shared variance, aligned broadly with our hypotheses inspired by Shaver and colleagues (2011): relative power contentment was negatively associated with hostility and interpersonally-focused negative emotions and positively associated with empathic perspective-taking.

Finally, the measures that appeared to strongly conflate wanting and having power (PRF Dominance and MPQ Social Potency) did not demonstrate significant relationships with hostility, empathy, adult attachment, or BPD traits, potentially suggesting that these measures are less able to identify distinct dimensions of power, as hidden cooperative suppression effects obscure their relationships with external criteria. In sum, these findings lend preliminary credence to the argument that failing to measure and conjointly examine both wanting and having power may often lead to misleading or incomplete findings.

Studies 2 and 3: Investigations in Online Adult Samples

In Studies 2 and 3, both using samples from Amazon Mechanical Turk (MTurk), we (a) investigated the convergent validity of the FP and DP scales with other measures of power/dominance and (b) attempted to conceptually replicate and extend findings from Study 1 in regard to the utility of distinguishing between and conjointly analyzing FP and DP. Additionally, in both studies, we conducted confirmatory factor analyses (CFAs) of the FP, DP, and AP items to corroborate their factorial validity. MTurk samples have been observed repeatedly to provide high-quality data, though they also appear to be characterized by higher levels of negative affect and lower levels of social connectedness than comparable nonclinical samples (McCredie & Morey, 2018).

In Study 2, we examined broadband personality domains, internalizing symptoms, and aggression. Study 3 aimed to (a) directly or conceptually replicate findings in Study 1 and/or Study 2, (b) further evaluate the convergent and discriminant validity of our FP and DP variables, and (c) examine whether similar results would be found using an alternative, pictures-based measurement of FP and DP constructs. In Study 3, we investigated the relations between our power dimensions and broadband personality domains, emotional distress, empathy, and

adult attachment. In both studies, we predicted that FP, especially its unique variance after covarying for DP, would be broadly associated with harmonious interpersonal functioning and reduced internalizing symptoms, whereas the unique variance of DP would be associated with aggressiveness, exploitativeness, and other self-centered aspects of antisociality, as well as increased emotional distress. To extend our methodology beyond self-report questionnaires, Study 3 included an alternative picture-based (graphical) measure of both FP and DP (see Figures 1 and 2), with the prediction that this alternative method of assessing these constructs would function similarly to the text-only questionnaire scales generated in Study 1, despite reducing unimethod variance (questionnaires correlating with other questionnaires), and would provide further evidence of construct validity for our FP and DP questionnaire variables.

Methods

Sample characteristics. In Study 2, the final sample ($n = 387$) was composed of 54.6% women, 44.3% men, and .5% other. The age of participants ranged from 18 to 78 ($M = 36.9$, $SD = 12.2$). The sample was 83.0% White or Caucasian, 5.9% Asian, 6.7% Black or African-American, 6.2% Hispanic or Latino, and less than 2 percent for both Middle Eastern and Native American. In Study 3, the final sample ($n = 386$) was composed of 52.1% women and 47.9% men. The age of participants ranged from 19 to 76 ($M = 36.6$, $SD = 11.09$). The sample ethnicities were 82.3% White or Caucasian, 4.7% Asian, 7.8% Black or African-American, 8.3% Hispanic or Latino, and less than 2 percent Middle Eastern and Native American each. IRB approval was obtained from XXXX for both studies. We excluded participants from analyses if they left 2 or more items blank from the FP/DP/AP item pool.

Measures

In Study 2, the FP ($\alpha = .81$, MIC = .42) and DP ($\alpha = .92$, MIC = .65) scales from the preliminary study were used, but one FP item was inadvertently omitted from the study protocol. Fortunately, in Study 1, these two slightly differing versions of the FP scale were extremely highly correlated ($r = .99$). In Study 3, the correct versions of the FP ($\alpha = .89$, MIC = .53) and DP ($\alpha = .94$, MIC = .71) scales were administered. In both studies, standardized residual variables were saved when regressing FP onto DP, and vice versa.

In Study 3, we administered a set of 10 picture comparisons. Five of the items used two side-by-side images of a non-gendered figure surrounded by other figures. The comparison images differed in regard to how large or small the central figure was in relation to the surrounding figures (see Figure 1). Another five of the items used two side-by-side images of pyramid hierarchies, with the comparison images differing by how high or low the darkened figure was placed within the hierarchy (See Figure 2). Participants were asked to rate on a 4-point Likert-type scale which of the two images best represented how much power they (a) felt themselves to have and (b) want to have. Mean responses were calculated across all 10 “having” prompts to create an alternative FP Pictures variable ($\alpha = .86$), and across all ten “wanting” prompts to create an alternative DP Pictures variable ($\alpha = .78$). As with the preliminary FP and DP scales, we regressed these variables onto one another to create standardized residual variables: *power contentment* and *hunger for power*, pictures-based forms.

In Study 2, for convergent validity purposes, we also administered the Dominance – Prestige scales (Cheng, Tracy, & Henrich, 2010), which aim to measure two strategic paths to attaining power/status. In this model, Prestige ($\alpha = .87$) represents an individual’s capacity to attain power/status by being well-liked, admired for competence, helpful to others, and so on. In contrast, Dominance ($\alpha = .87$) represents the capacity to attain power/status by being

intimidating, domineering, and coercive. The major limitation of these scales, however, is that the “Prestige” scale items primarily facially assess *having* social power (e.g., “Others do not value my opinion”), whereas the “Dominance” scale items primarily assess *wanting* or *seeking* power (e.g., “I try to control others rather than permit them to control me”). As a result, these scales inadvertently index subjectively having and wanting power, respectively, more so than distinguishing prestige and dominance pathways to power. For convergent validity, in Study 3, we also administered the single-item Power domain of the Schwartz Values Scale short-form (SVS short; Lindeman & Verkasalo, 2005), on which participants rate the importance of a particular value domain to them (e.g., “power”) on an 8-point Likert scale ranging from “0 = opposed to my principles” to “8 = of supreme importance.” This SVS item (Power as Life Value) theoretically reflects desire for power rather than feeling powerful.

Broadband personality dimensions. Study 2 included the 100-item HEXACO Personality Inventory – Revised (HEXACO PI-R; Ashton & Lee, 2007) and Study 3 included the 60-item HEXACO Personality Inventory – 60 (Ashton & Lee, 2009). The HEXACO model is largely equivalent to the Big 5 model but adds an additional factor of “Honesty-Humility” based on archival and cross-cultural research (Ashton & Lee, 2007). Honesty-Humility (α s were .88 and .78 for Studies 2 and 3, respectively) is composed of the facets sincerity, fairness, greed-avoidance, and modesty. Emotionality (α s were .86 & .71) is composed of the facets fearfulness, anxiety, dependence, and sentimentality. Extraversion (α s were .90 & .80) is composed of the facets social self-esteem, social boldness, sociability, and liveliness. Agreeableness (α s were .88 & .84) is composed of the facets forgiveness, gentleness, flexibility, and patience. Conscientiousness (α s were .85 & .80) is composed of the facets organization, diligence, perfectionism, and prudence. Openness to Experience (α s were .87 & .82) is composed of the

facets aesthetic appreciation, inquisitiveness, creativity, and unconventionality. Including the HEXACO allowed us not only to examine general broadband personality dimensions for divergence in the nomological networks of the FP and DP constructs, but also buttressed our focus on harmonious versus antagonistic interpersonal functioning and moral corruption, through the Agreeableness and Honesty/Humility scales, respectively.

Emotional distress. In both Study 2 and Study 3, in order to better investigate the emotional calm and emotional distress predictions derived from Shaver and colleagues (2011), we administered the Social Interaction Anxiety scale (SIAS; Mattick & Clarke, 1998), which yields a total score (α s were .96 and .94, in Studies 2 and 3, respectively), and the Center for Epidemiologic Studies Depression scale-Revised (CESD-R, Eaton et al., 2004), which also yields a total score (α s were .97 & .96). As a measure of general anxiety, in Study 3, we administered the Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990), which yields a total score ($\alpha = .97$).

Other interpersonal functioning variables. In Study 2, we included the BPAQ scales, which includes anger ($\alpha = .86$), hostility ($\alpha = .87$), verbal aggression ($\alpha = .71$), and physical aggression ($\alpha = .87$) subscales. In Study 3, we included the Affective and Cognitive Measure of Empathy (ACME; Vachon & Lynam, 2016), which assesses a broad operationalization of empathy (cf. Jordan, Amir, & Bloom, 2016), with potentially superior psychometric properties in comparison with the IRI (Murphy et al., 2018) and contains three scales: Cognitive Empathy (CE, $\alpha = .93$), which measures an individual's self-perceived ability to recognize and understand the thoughts and feelings of others, thought not necessarily actual ability, a construct we conceptualize as "mindreading confidence"; Affective Resonance (AR, $\alpha = .92$), which measures an individual's sympathetic concern for the joys and sorrows of others; and Affective

Dissonance (AD, $\alpha = .93$), which is largely synonymous with sadism and/or schadenfreude. The ACME AD scale is reverse-scored, such that higher scores indicate less affective dissonance. In Study 3, we also included the ECR-R, which was employed in Study 1 (subscale α s both = .95). Finally, in Study 3, we administered the Psychological Entitlement Scale (PES; Campbell et al., 2004, $\alpha = .90$) as a measure of selfish egocentricity, commonly discussed as a core aspect of antagonism and self-serving behavior associations with power.

Hypotheses

We hypothesized that FP and our residual power contentment variable would generally be associated with enhanced empathy, reduced aggression, reduced entitlement, and reduced emotional distress; DP and hunger for power would be associated with increased aggression, entitlement, emotional distress, and reduced empathy.

Results

Factor analyses. We used the lavaan package (Rosseel, 2012) in R version 3.4 for all factor analyses, which were conducted using the MLR (robust maximum likelihood) estimator, which is appropriate for ordinal data where there are 6 or more response categories (Rhemtulla, Brosseau-Liard, & Savalei, 2010). For post-hoc EFAs, we employed principal axis factoring with promax rotation using the PSYCH package in R (Revelle, 2017).

In Study 2, using CFA, the 3-factor model yielded marginal fit (CFI = .90, TLI = .88, RMSEA = .09, 95% CI [.08, .10]; $\chi^2 = 576.07$, $df = 149$, $p < .001$), so we examined the factor structure exploratorily. Horn's parallel analysis indicated 3 factors, all with eigenvalues above 1. The EFA extracting 3 factors (TLI = .93, RMSEA = .07, 95% CI [.06, .08]; $\chi^2 = 324.14$, $df = 117$, $p < .001$) indicated that all items preferentially loaded on their intended factors, but that the two positively worded FP items displayed substantially weaker factor loadings (.39 and .44) than

did the reverse-worded items (ranged from .56 to .81). A CFA model with the three correlated scale factors plus two wording method factors (positive and negative coded), set to be uncorrelated both with one another and with the substantive variables, demonstrated good fit (CFI = .96, TLI = .95, RMSEA = .06, 95% CI [.05, .07]; $\chi^2 = 277.13$, $df = 130$, $p < .001$).

In Study 3, using CFA, the 3-factor model yielded poor fit (CFI = .89, TLI = .87, RMSEA = .10, 95% CI [.09, .11]; $\chi^2 = 771.46$, $df = 167$, $p < .001$), so we again examined the factor structure exploratorily. Horn's parallel analysis indicated 3 factors, all above an eigenvalue of 1. The EFA extracting 3 factors (TLI = .95, RMSEA = .06, 95% CI [.06, .07]) indicated that one positively coded FP item, with a noticeably weaker loading than the other items, loaded nearly as highly on the DP factor (.33) as on the FP factor (.39). This was the same item ("I have a lot of confidence in my ability to make things happen") that loaded at .39 in Study 2 (but did not load nearly as highly on DP in that study, only at .14). We tentatively interpret this as an indication that keying direction (positively versus negatively coded items) influenced the factor structure, but it is also possible that the differentially keyed items provide information at a different level or aspect of the latent trait. Accounting for keying direction, a model with the 3 correlated scale factors plus two uncorrelated keying factors (positively and negatively coded) demonstrated good fit (CFI = .95, TLI = .93, RMSEA = .07, 95% CI [.07, .08]; $\chi^2 = 443.83$, $df = 147$, $p < .001$).

In sum, consistent with Study 1, Studies 2 and 3 indicated that the factor structure of the FP/DP/AP items may be affected to some degree by keying direction, with positively coded items and negatively coded items tending to load differently; furthermore, one item appeared potentially problematic in both Studies 2 and 3. Nonetheless, given that the original scale

structure demonstrated good fit after accounting for keying direction in our models, we decided to retain it and use it in all studies (for a similar approach, see Vachon & Lynam, 2016).

Convergent validity. Convergent validity correlations are presented in Tables 3 and 4. As in Study 1, FP and DP were substantially correlated in Study 2 ($r = .35$) and Study 3 ($r = .45$). In Study 2, both FP and DP were robustly correlated with both Dominance and Prestige, as well as with AP (r s ranged from .36 to .83). Although both residual variables correlated positively with AP, FP's unique variance correlated positively only with Prestige ($r = .58$), whereas DP's unique variance correlated strongly with Dominance ($r = .75$) but only weakly with Prestige ($r = .17$). This finding aligns with the view that the Dominance – Prestige scales function more as wanting and having power scales than as measures of two separate pathways to achieving power.

In Study 3, FP was positively correlated with FP Pictures ($r = .59$) and DP Pictures ($r = .38$), as well as the FP Pictures residual ($r = .46$), but not the DP Pictures residual or the Power Value item of the SVS (r s = .09 & .02, respectively). DP, in contrast, was only weakly positively correlated with FP Pictures residual ($r = .19$), but substantially correlated with the other convergent validity variables (r s ranged from .32 to .52).

The relations between the FP and DP scales, on the one hand, and the FP and DP Pictures, on the other, largely supported their respective convergent and discriminant validities. In particular, the residual FP variable was substantially correlated with the FP Pictures residual ($r = .42$) but not the DP Pictures residual. Similarly, the residual DP variable was substantially correlated with the DP Pictures residual ($r = .31$), but not the FP Pictures residual. These findings support the use of the DP residual as a measure of hunger for power and the FP residual as a measure of power contentment, given that (a) the pictures-based measures seem to be clear in their meaning (“how much power you currently have” and “how much power you currently

want”) and (b) both operationalizations of the FP and DP constructs aligned with one another in their residuals, despite using very different methodologies. These convergent and discriminant validity findings were further buttressed in that the nomological networks of the FP and DP constructs were typically (but not invariably) similar for the text-only and the pictures-based measurement methods, as discussed further.

SVS Power as Life Value was not significantly related to either the FP or FP Pictures variables (except for a negative correlation with residual FP), but was positively correlated with the DP ($r = .52$) and DP Pictures ($r = .20$) variables, as well as their residuals (r s were .58 and .19, respectively). FP and DP cooperatively suppressed one another’s relationships with Power as Life Value (completely standardized indirect effects were $B = .29$, with DP as the mediator, and $B = -.12$, with FP as the mediator), with our power contentment variable (FP covarying for DP) relating to a lower endorsement of power as a life goal and our hunger for power variable relating to a higher endorsement of power as a life goal. These findings further support the DP residual variable as a measure of hunger for power and the FP residual variable as a measure of relative power contentment.

HEXACO dimensions. Correlations with HEXACO for Studies 2 and 3 are presented in Table 5 and Supplemental Table 3. As assessed by the FP-DP scales and FP-DP Pictures items, Feeling Powerful was robustly negatively correlated with Emotionality (r s ranged from $-.21$ to $-.38$), and positively correlated with Extraversion (r s from $.54$ to $.73$), Agreeableness (r s from $.15$ to $.19$), Conscientiousness (r s from $.17$ to $.49$), and Openness (r s from $.14$ to $.26$). In sharp contrast, although it also correlated negatively with Emotionality (r s were $-.34$ and $-.21$, for Studies 2 and 3 respectively) and positively with Extraversion (r s were $.39$ and $.46$), DP was negatively correlated with Honesty/Humility (r s were $-.55$ and $-.47$) and Agreeableness (r s were

-.25 and -.18). The DP Pictures variable displayed nearly the same pattern of correlations except that it was not significantly associated with Agreeableness.

A number of suppression effects were noteworthy. First, in Studies 2 and 3, residual FP demonstrated positive correlations with both Honesty-Humility, findings that were not observed for FP at the zero-order level. In both studies, FP and DP demonstrated significant cooperative suppression effects in regard to Honesty/Humility (absolute values of B s ranged from .06 to .28). These cooperative suppression effects significantly replicated with the FP Pictures and DP Pictures variables in relationship to Honesty/Humility (DP Pictures as mediator, $B = -.16$; FP Pictures as mediator, $B = .09$).

Similar suppression effects, for FP and DP, were observed in both studies for Agreeableness (absolute values of B s ranged from .11 to .15) and Conscientiousness (absolute values of B s ranged from .06 to .19). These suppression effects were not, however, observed when using the FP and DP Pictures variables.

Emotional distress. Correlations with negative emotionality variables are presented in Tables 3 and 6, as well as Supplemental Tables 2 and 4. The FP scale and the FP Pictures items were robustly negatively correlated with depression (r s ranged from -.36 to -.45), general anxiety (FP, $r = -.52$; FP Figures, $r = -.45$), and social anxiety (r s ranged from -.50 to -.73). These patterns remained for the FP residual and FP Pictures residual (r s ranged from -.35 to -.44). DP, whether measured through the DP scale or the DP Pictures variable, was robustly negatively associated with social anxiety (r s ranged from -.24 to -.26) and general anxiety (DP, $r = -.24$; DP Figures, $r = -.21$), but not robustly associated with depression. Importantly, all of Desire for Power's negative associations with emotional distress (whether DP or DP Pictures) became nonsignificant after statistically covarying for shared variance with FP or FP Pictures.

Interpersonal functioning. In Study 2, the findings for the BPAQ scales were similar to those of Study 1, with DP positively associated with all four aggression variables (r s ranged from .18 to .43) and FP negatively associated with Anger ($r = -.37$) and Hostility ($r = -.46$). Significant cooperative suppression effects were observed for all four aggression variables (absolute values of B s ranged from .06 to .21), such that the FP residual was more strongly negatively associated with anger and hostility than raw FP and demonstrated significant negative correlations with verbal and physical aggression that were not observed at the zero-order level. DP residual, in contrast, demonstrated stronger positive association with all these variables than was observed at the zero-order level.

Turning to Study 3, although the FP-DP construct variables all demonstrated positive zero-order correlations with psychological entitlement (r s ranged from .23 to .59), the FP residual and FP Pictures residual were not significantly correlated with it, suggesting that self-centered entitlement is related more to desire for power than to feeling powerful. In regard to empathy, multiple cooperative suppression effects emerged (absolute values of B s ranged from .14 to .27). Although FP was not significantly related to either ACME AR or ACME AD at the zero-order level, its residual was substantially positively correlated with AR ($r = .28$) and with AD ($r = .32$). The DP residual, in contrast, was more negatively correlated with AR ($r = -.41$) and with AD ($r = -.52$) than observed at the zero-order level. These suppression effects were not, however, observed with the FP Pictures and DP Pictures; neither of those variables, nor their residuals, were associated with either the AR or the AD scale.

Replicating findings in Study 1, FP and FP Pictures both were negatively correlated with attachment anxiety (r s were -.48 and -.35, respectively) and attachment avoidance (r s were -.41 and -.28), whereas DP and DP Pictures were not related to these measures. Unlike Study 1,

however, the FP and DP scales demonstrated significant cooperative suppression effects in regard to both attachment anxiety and avoidance (absolute values of the completely standardized indirect effect, *B*s, in these mediation analyses ranged from .11 to .28).

Discussion

The findings in Studies 2 and 3 broadly corroborated our hypotheses and were largely consistent with those of Study 1. The convergent and discriminant validities of the FP and DP scales were supported by their distinctive associations with other power-related variables, including alternative picture-based measurements of both constructs. It seems clear that, to some large degree, the residual variables conceptually align with the construct of *power contentment* versus *hunger for power*. These studies demonstrated that the DP and FP measures demonstrate substantially different nomological networks, despite correlating substantially with one another at the zero-order level. Especially in regard to interpersonal functioning and personality variables, desire for power is generally associated with disagreeableness, unethical self-aggrandizement, and reduced empathy, whereas feeling powerful is associated with agreeableness and secure attachment.

Strikingly, the DP and FP variables demonstrated substantial cooperative suppression effects, in some cases replicated in both studies, in regard to honesty/humility, agreeableness, conscientiousness, aggression, empathy, and adult attachment. In a broader sense, the unique variances of FP and DP appear to possess dramatically diverging nomological networks, as displayed in Table 7, which presents strong associations for both in Studies 1-3. In sum, studies that do not distinguishably measure and conjointly analyze wanting power and having power, may be frequently expected to generate misleading or incomplete findings, perhaps especially in regard to domains in which we observed cooperative suppression effects.

Study 4: Competitive Behavior, Testosterone, and Cortisol in a University Sample

In Study 4, we investigated whether desire for power and feeling powerful were differentially predictive of trait competitiveness, performance in a laboratory task designed to measure individual differences in the behavioral expression of “competitive will”, and competition-related levels of testosterone and cortisol.

Competition, a contest between one or more individuals or groups for a limited resource, is a way of determining one’s social status among others (Casto & Edwards, 2016). Winning a competition confers dominance and thus, the possession of higher rank, power, and access to resources (Mazur, 1985). Because dominance and social status have been linked to individual differences in levels of the steroid hormones testosterone and cortisol in various animal species, including humans (Casto & Mehta, 2019; Hamilton et al., 2015), considerable research has been directed at understanding the hormonal consequences of both engaging in competition and competition-related shifts in status (for review, Casto & Edwards, 2016; Mazur & Booth, 1998). Specifically, previous research has revealed positive associations between testosterone and status-related behaviors, as well as trait “implicit power motivation” assessed through projective tests (Eisenegger et al. 2011; Stanton and Schultheiss 2009).

Cortisol is well-known for its positive relationship with stress, both psychological and physical. Acute psychological experiences of stress, particularly social-evaluative stress, combined with a perceived lack of control over one’s environment and outcomes, produce reliable and transient increases in cortisol (Dickerson & Kemeny, 2004). Research in humans and non-human primates has shown that cortisol levels are often inversely related to social status (Decker, 2000; Sapolsky, 2005; Sherman et al, 2012).

Methods

Sample characteristics. A sample of 217 undergraduates participated in the study in return for partial course credit. The sample included 151 women and 66 men, with a mean age of 19.1 years ($SD = 1.3$ years, range = 17 to 25). Institutional Review Board (IRB) approval was obtained from the XXXX IRB. Of the 217 participants who participated, only 131 women and 59 men competed in the competitive will behavioral task.

Competitiveness Index (CI). The original CI (Smither & Houston, 1992) was designed to measure global positive and negative attitudes regarding competition. The revised version (Houston et al., 2002) contains 14-items on a 5-point Likert scale along two subscales: enjoyment of competition (CI Enjoy) and contentiousness (CI Contentiousness). CI Enjoy ($\alpha = .83$) consists of 9 items relating to general competitiveness (e.g., “I am a competitive individual” and “I often try to outperform others”) and should be understood as assessing an individual’s desire to compete with others and enjoyment of competition. We hereafter refer to the CI Enjoy scale as “self-reported competitiveness.” CI Contentiousness ($\alpha = .74$) consists of 5 reverse-coded items relating to submissiveness and avoidance of arguments, with little direct facial relationship to competitiveness (e.g., “In general, I will go along with the group rather than create conflict” and “I will do almost anything to avoid an argument”). Based on its face validity, we regard this scale as assessing “non-submissiveness” as opposed to competitiveness. In study 4, self-reported competitiveness and non-submissiveness were only modestly correlated ($r = .28$).

Competitive will task. A novel competitive task was employed to test individual differences in the willingness to endure discomfort in order to win a competition. Participants held a weight (11lb. for women, 2 lbs. for men) at arm’s length and shoulder height for as long as they wanted in competition against other participants. A \$20 cash prize was offered to the one male and female participant who held their arm up the longest of anyone else that semester. The

weight differential between men and women was decided based on pilot studies generating equivalent mean performance times for men and women with a 1:2 weight ratio. Participants were not given a reference for performance (i.e., the current leading time and average performance time were not revealed). Sixty-four of the participants competed individually (women, $N = 47$; men, $N = 17$), whereas 126 competed in same or opposite-sex dyads (to compare more and less competitive contexts; see random assignment procedures below). Both the participants competing individually and competing in pairs were told “The competition has to do with who has the most competitive will – who can endure the discomfort of holding up their arm the longest in order to attempt to be a winner.” Participants’ shoulder height was marked with a line marked on an index card taped to the wall and participants were instructed to hold their arms at that height and to drop their arms when they no longer wished to compete or could no longer physically keep their arm above the line, whichever came first. Performance time was recorded and revealed to each participant when he or she dropped her arm by placing the timer on the table.

Willingness to compete again. Immediately after the competition, participants were asked to circle their response to this question, “If told you would have to complete a second task, which option would you choose, assuming all options would take the same amount of time? A) Compete again in the same task, B) Compete in a different task, or C) Not compete, but instead complete another questionnaire.” For purposes of analysis, as an additional measure of competitive drive, we coded responses dichotomously: prefer to compete again or prefer to take a questionnaire.

Saliva samples and hormone assay. Participants were instructed not to eat, exercise, smoke, or consume caffeinated beverages or food within the hour prior to arriving at the

laboratory for the study. Saliva samples were obtained before, immediately after, and 15 minutes after competing in the competitive will task. Immediately before providing a saliva sample, each participant rinsed his/her mouth with water. Approximately 1.5-1.8 ml of saliva was collected for each sample via passive drool in 2 ml plastic vials using plastic saliva collect aids (Salimetrics). For any given sample, collection time varied according to the individual, but typically took between 3-5 minutes. Samples were stored at -20°C initially and then transferred to a -80°C freezer within several hours. Samples were assayed in duplicate for T and C on a single thaw by XXXX using competitive enzyme immunoassay kits from Salimetrics (State College, PA). The coefficients of variation (CV%) for low-cortisol and high-cortisol samples were 1.3 and 6.6%, respectively. CV% for low-testosterone and high-testosterone were 18.0 and 6.2%, respectively. All participants were tested in the afternoon between 2-4 PM to standardize collection time with reference to normal diurnal fluctuation in testosterone and cortisol levels.

In men, testosterone levels were generally normally distributed, but cortisol levels were positively skewed. In women, both testosterone and cortisol levels were positively skewed. In order to account for skewness in the hormonal data, we first investigated for outlier subjects whose baseline cortisol levels or baseline testosterone levels were more than 3 standard deviations higher than the mean for their sex (a common SD benchmark for identifying outliers in hormone analyses, Pollet & van der Meij, 2017). In total, 6 subjects (4 women, 2 men) were excluded from cortisol analyses, and 4 subjects (3 women, 1 man) from testosterone analyses. To further account for non-normality, hormone levels across men and women were log-transformed. These analytical decisions improved the normality of the data, but cortisol distributions remained somewhat skewed in both men (skewness from 1.34 to 1.25; SDs from .30 to .31) and women (skewness from 1.06 to 1.29; SDs from .20 to .22). Women using hormonal contraceptives (OCs)

typically have lower basal levels of testosterone than non-users (e.g. Zimmerman et al., 2014), so hormonal contraceptive use was queried and subsequently controlled for in hormone analyses. In women, contraceptive use exhibited a substantial negative point-biserial correlation with testosterone at each time point (r_s from $-.45$ to $-.50$), as well as with immediate post-competition cortisol ($r = -.18$) and delayed post-competition cortisol ($r = -.27$).

Procedure

Men and women were randomly assigned to either be the only participant in the room or one of two tested at the same time. Pairs were also randomly assigned to either same-sex or mixed-sex pairs. Resulting experimental groups were: women competing individually, men competing individually, women vs. men, women vs. women, and men vs. men. In our behavior and hormone analyses, we covaried for dyad type and sex. All participants were tested with the same female experimenter. An additional group of participants (7 men, 20 women) completed questionnaires, but did not compete. Instead, they sat in the same room and interacted with the same female experimenter for approximately 5-7 minutes and provided saliva samples before and after this interaction. This group served as a quasi-control condition to test the effects of interacting with a female experimenter, independent of competition.

Upon arrival, participants read and signed a consent form and received a brief explanation of the study (i.e., that the study was about the relationships among personality, social context, competition, and hormones). Participants were told explicitly that the purpose of collecting saliva samples was to measure levels of testosterone and cortisol. After consent, they completed questionnaires for approximately 15 minutes and provided their first baseline saliva sample. Next, the experimenter gave specific instructions about the competition, indicating that there was “an overall grand prize of \$20 each to the man and woman who holds his or her arm up

the longest of all the other same-sex participants being tested this semester.” Participants then competed in the competitive will task. After the competition, participants provided their immediate post-competition sample and indicated, privately, their willingness to compete again. Then, they completed an unrelated questionnaire designed to serve as filler task for 15 minutes between the end of competition and the final saliva sample (delayed post-competition sample).

Potential sex differences and analytical methods

Socialized gender norms frequently differ for men and women in relationship to competition, with competitiveness encouraged more in men than in women (Casto & Prasad, 2017). Some evidence suggests that these kinds of gender norms also affect biological measurements of testosterone in competitive situations (van Anders, Steiger, & Goldey, 2015). Although we conducted our statistical analyses primarily aggregated across men and women, covarying for sex in all analyses, and also covarying for dyad type (both men, both women, mixed sex, or solo) for the behavior and hormone analyses, competition-related hormone findings frequently substantially differ between men and women, often with more pronounced findings in men (e.g., Wu et al, 2017). Although this difference could provide an a priori justification for analyzing men and women separately in competition-related hormone analyses, Casto and Prasad (2017) recommend first testing effects with combined samples of men and women, and then analyzing them separately if significant sex interactions effects are detected. In conducting such interaction analyses in our sample, however, our statistical power was low due to the relatively small number of men. Similarly, in conducting hormone analyses separately for men and women, our power sensitivity was low, particularly for men.

Results

Unlike the correlations in our previous studies, FP and DP were only slightly positively correlated ($r = .18$). Because of the relatively weak relation between FP and DP in this sample we did not examine residual FP and DP variables nor did we conduct mediation analyses to test for suppression effects.

Trait competitiveness, non-submissiveness, and competitive will performance. FP was significantly positively correlated with both self-reported competitiveness (CI Enjoy; $r = .30, p < .001$) and non-submissiveness (CI Contentiousness; $r = .32, p < .001$). DP was also positively correlated with self-reported competitiveness ($r = .43, p < .001$) and non-submissiveness ($r = .32, p < .001$). DP and FP did not significantly differ in their relationships with the CI scales (both Steiger's Z s, $p > .10$).

DP was positively correlated with performance time in the competitive will task ($r = .21, p = .004$), but FP was not ($r = .003, p = .97$). DP was also positively correlated with desire to compete again rather than complete a questionnaire ($r = .21, p = .004$), whereas FP was not ($r = -.02, p = .81$).

Competition-related levels of testosterone and cortisol. In the sample combining men and women, neither FP nor DP was significantly correlated with cortisol or testosterone at any time point (all p s $> .10$, all r s $>$ absolute value of $.13$). Moderation analyses (99% confidence intervals, 1000 bootstrapped samples) indicated that sex moderated the relationship between FP and cortisol at all time points (ΔR^2 s from $.04$ to $.06$; p s from $< .001$ to $.004$), but not between FP and testosterone. Sex did not moderate DP's relationship with either cortisol or testosterone. In men, FP was substantially negatively correlated with cortisol at all three time points (r s from $-.37$ to $-.39$, all p s $= .003$). FP was not significantly correlated with cortisol in women (r s from $.06$ to $.10$, p s from $.26$ to $.47$).

Discussion

Results in Study 4 were only partly consistent with our expectations. The relatively weak relationship between FP and DP in this sample, combined with low statistical power due to the small number of men and the small numbers of subjects in each dyad or solo type, prevented credible examination of our hypotheses regarding power contentment and hunger for power using residual variables and mediation analyses. Nonetheless, our results indicate that DP is associated with competitive will as assessed behaviorally, both by the length of time individuals held uncomfortable weights and also by expressed willingness to compete again, whereas FP is not. This divergence supports the convergent and discriminant validity of our scales, as desire for power is more theoretically overlapping with striving for competitive dominance than is feeling powerful. Although the positive relationships between FP and DP and the CI scales indicates that both are associated with heightened general competitiveness and non-submission, as expected, competitiveness as assessed by the CI is not parsed into components such as enjoyment, confidence, or desire to dominate. As a result, we are not able to offer fine-grained theoretical interpretations of these findings.

Finally, results from Study 4 demonstrate, albeit only provisionally, that FP could potentially be related to stress hormones, perhaps only in men, but the high risk of type I error in our analyses precludes any strong interpretation. These pilot-level findings may, however, motivate further follow-up hormone research with larger participant samples.

General Discussion

Across four studies, using multiple and diverse measurement methods, our results indicate that, despite typically being intercorrelated, *desire for power* (DP) and *feeling powerful* (FP) are associated with substantially different nomological networks, with measures of the two

constructs frequently relating to theoretically meaningful external variables, such as agreeableness and empathy, in opposite directions. In many cases, their nomological networks shift markedly when examining one after statistically covarying for the other. Such cooperative suppressor effects (which tend to be rare and conceptually important; Paulhus et al., 2004) imply that theoretical discussions and empirical investigations that neglect to effectively distinguish between having and wanting power will often be misleading or incomplete. In particular, our findings strongly indicate that associations between power and negative interpersonal or moral characteristics, such as egocentricity, lack of empathic caring, and antagonism, appear to depend upon whether the unique variance in feeling powerful or desire for power is examined.

Our results provisionally demonstrate that two extant measures that conflate having and wanting power, namely, the PRF Dominance scale and the MPQ-BF Social Potency scale (perhaps including the non-brief version), may be compromised in this regard, as (a) they related substantially to both FP residual (power contentment) and DP residual (hunger for power), and (b) they failed to exhibit significant relationships with variables in multiple cases where FP residual and DP residual demonstrated clear opposing associations. Similar problems in interpretation may extend to other measurement approaches, ranging from other self-report questionnaires to experimental priming and naturalistic observation methods. We encourage researchers to consider distinguishing between and conjointly analyzing these two constructs in future efforts to measure social power, dominance motivation, and other related constructs.

For example, in some “Big 2” models of personality or social perception, the widely discussed construct of trait “Agency,” commonly examined in relationship to trait “Communion,” is conceptually framed and operationalized similarly to power, social potency, or dominance (e.g., Wiggins, 1979; also see related competence – warmth model by Fiske, Cuddy,

Glick, & Xu, 2002). Some research investigations of agency have employed item pools that are strongly similar to DP (e.g., “ambitious,” “bossy,” and “competitive” in Gebauer, Paulhus, & Neberich, 2013), whereas other investigations of agency have slanted towards using items that seem more related to FP (e.g., “self confident,” “independent,” and “stand up well under pressure” in Ward et al., 2006). The results of our studies indirectly raise the possibility that these kinds of operationalization differences between various investigations of Big 2 models may generate very different research associations, perhaps especially in regard to interpersonal functioning variables. For instance, the degree to which Agency and Communion are orthogonal to one another in such models, a longstanding issue in discussions (e.g., Imhoff & Koch, 2017), may hinge on the relative extent to which content related to having versus wanting power is represented in operationalizations of Agency. Similarly, to the extent that having and wanting elements may be conflated in various research measurements of Agency, some conclusions drawn by researchers might be problematic. In other words, the important distinctions demonstrated in our four studies may extend beyond just “power” research, with substantive implications for other personality and interpersonal research measures more broadly.

On a deeper theoretical level, we found evidence for theories positing that the discrepancy between having and wanting power is psychologically critical (e.g., Johnson et al., 2012; Shaver et al., 2011), a concept that we discuss in terms of *power contentment* versus unsatisfied *hunger for power*. In general, as displayed in Table 7, the unique variance of DP (*hunger for power*) is moderately or strongly associated with reduced honesty/humility, feelings of entitlement, coldheartedness towards others, and various aspects of aggression. This pattern of findings presents a picture of a person who feels that he or she deserves more than other people, and who is psychologically equipped to exert aggression towards others in the pursuit of gaining

more power. In contrast, the unique variance of FP (*power contentment*) is moderately or strongly associated with social confidence, emotional calm and security, conscientiousness, interpersonal connection, and reduced aggression. This pattern of findings presents a picture of a person who has achieved enough power to feel content, emotionally secure, confident, and able to amicably connect with others out of a feeling of abundance. The pattern of relations for *power contentment* and *hunger for power* were similar when our picture-based measurement method was examined rather than the questionnaire variables, though the relations tended to be weaker.

Interpersonal Functioning

Across multiple studies, FP was moderately to strongly negatively associated with hostility, whereas DP was positively associated with all aspects of aggression measured. One of our broad hypotheses was that the unique variance of feeling powerful (relative power contentment) would be associated with reduced conflict behavior and with more harmonious interpersonal behavior. Indeed, these differential patterns of association became even more evident at the residual level where, reflected in substantial cooperative suppression effects, the unique variance of FP (power contentment) was more negatively associated with aggression, while the unique variance of DP (hunger for power) was more positively associated with it.

More broadly, across two studies, and multiple measurement methods, DP was moderately to strongly associated with lower levels of general trait honesty/humility, whereas FP was not associated with them at the zero-order level. Reflected in consistent cooperative suppression effects, the unique variance of FP was positively associated with honesty/humility, whereas the unique variance of DP was even more strongly negatively associated with it. Similarly, FP was slightly positively correlated with agreeableness, in all three operationalizations of the relationship, whereas DP tended to be weakly negatively or negligibly

associated with it. Using the text-based scales, we found cooperative suppression effects in both studies, with FP becoming more positively and DP becoming more negatively associated with agreeableness, after controlling for one another.

In both studies assessing empathy (studies 1 and 3), we again observed cooperative suppression effects with the FP and DP scales, with FP becoming significantly positively correlated with aspects of empathic caring and DP becoming significantly negatively or more negatively associated with the same aspects. This effect, however, was not observed using the figures-based measurement method. Furthermore, in multiple studies and with multiple measurement methods, FP was robustly associated with more secure adult attachment, whereas DP was not. In Study 3, we observed significant cooperative suppression effects in this regard, but only with the scales and not with the figures-based measurement. Finally, although both the scales and the figure-based measures of FP and DP were correlated with psychological entitlement at the zero-order level, examination of the unique variances indicated that this was due to shared variance with DP, not necessarily to feeling powerful by itself.

As empirical psychological study of the correlates and consequences of power has burgeoned rapidly in recent years, most relevant findings have seemed to confirm the notion that power and harmonious prosociality are at odds with one another, that the psychological experience of power is frequently associated with unloving characteristics such as heightened selfishness (Rucker, DuBois, & Galinsky, 2011) and lack of compassionate caring (van Kleef et al., 2008). Our results, however, indicate that these relationships may be different or more complicated than previously observed, and that feeling powerful appears to actually be related to agreeable, sincere, nonconflictual emotional connection, whereas desire for power appears to be broadly associated with such variables in an opposing direction.

Emotional Distress

We hypothesized that the unique variance of feeling powerful (power contentment) would be associated with emotional contentment. This hypothesis was partially corroborated, but, contrary to our expectations, we did not observe consistent cooperative suppression effects. Across multiple studies and using multiple measures, FP, both at the zero-order level and in terms of power contentment, was consistently and substantially negatively correlated with depression and anxiety. Although DP was also weakly to moderately negatively correlated with depression and anxiety at the zero-order level, hunger for power (DP residual) was not, indicating that DP's shared variance with FP drove the associations.

In Study 1, we observed a cooperative suppression effect for BPD traits, which are associated with emotional distress and dysregulation. FP was weakly negatively correlated with BPD traits and DP was weakly positively correlated with them, and their unique variances were even more strongly correlated in opposing directions. In future work, it will be important to ascertain which aspect or aspects of the heterogeneous borderline personality construct drove these associations. Nonetheless, our results indicate that FP is substantially associated with reduced emotional distress, whereas DP is not, at least in regard to its unique variance.

In general, our results are consistent with prior research indicating that possession of power is associated with reduced negative emotionality (e.g., Wojciszke & Struzynska-Kujalowicz, 2007). Our results weakly indicate, though, that prior negative associations observed between trait dominance, or social potency, and negative emotion (e.g., Anderson & Berdahl, 2002), might be primarily attributed to aspects of feeling powerful, not to desiring power.

Competitiveness

Engaging in competition and exerting competitive effort during competition are ways to increase one's social power. Thus, desire for power, more so than feeling powerful, should positively relate to behavioral displays of competitiveness. Its modest sample size notwithstanding, Study 4 revealed that DP, but not FP, was associated with increased competitive drive using two behavioral measures: the length of time an individual endured discomfort in pursuit of winning a competition and an individual's expressed willingness to compete again. This finding demonstrates that our self-report DP scale is capable of relating to behavioral correlates, not only other questionnaires, even though self-report scales rarely relate substantially to isolated behavioral variables in the absence of aggregation (Epstein, 1979). At the same time, this finding for DP, and the non-finding for FP, further support their convergent and discriminant validities. Additionally, our findings weakly indicated that FP may be related to cortisol levels, perhaps only in men, but our small sample size precludes any strong conclusions. Our findings tentatively indicate that FP and DP may be valuably and differentially related to competitiveness, but future research in larger participant samples is needed to effectively explore their associations and evaluate our hypotheses. Although research on the behavioral correlates of constructs like FP and DP is typically more costly and time-intensive than research involving only self-reports and reaction times (Baumeister, Vohs, & Funder, 2007; Doliński, 2018), our results encourage further research with behavioral variables.

Conscientiousness

We did not advance any a priori hypotheses regarding trait conscientiousness, but in multiple studies FP was moderately to strongly *positively* correlated with conscientiousness, whereas DP was not significantly associated with it. Furthermore, for the scale measures, we

observed cooperative suppression effects such that residual FP was more strongly positively correlated with conscientiousness, whereas residual DP was negatively correlated with it.

In post-hoc exploratory analyses not reported here, this suppression effect was generated primarily by the prudence facet of the HEXACO Conscientiousness dimension, which relates to deliberative planning and impulse control. FP bore a positive relationship with prudence, whereas DP bore a negative relationship; these opposing relationships became more pronounced for both FP and DP after controlling for the other. This unexpected finding runs counter to findings that associated the feeling of power with increased risk-taking (e.g., Anderson & Galinsky, 2006); perhaps it is possible to be a “prudent risk-taker” (e.g., see Dickman’s [1990] distinction between functional and dysfunctional impulsivity). The variables analyzed in the studies reported here do not allow for in-depth exploration of these seemingly contradictory findings, but future work should aim to clarify the relationship between power and risk-taking by measuring wanting and having aspects of power conjointly in experimental paradigms.

Limitations and Future Directions

The measures developed and used in our studies suffer from a number of limitations, and should be revised or replaced with other measures for future power/dominance research to be most effectively conducted. Perhaps the most notable limitation is that our scales, and the alternative figures-based measure, do not clearly distinguish the *types* of power that individuals may possess or desire. As has been theorized and preliminarily demonstrated by Lammers et al. (2016), power as *influence*, the ability to affect the actions of others, and power as *autonomy*, the ability to act without being restricted or controlled by others, appear to be related but distinguishable. It is possible that feeling powerful, desiring power, and the construct of power

contentment versus power hunger may bear substantially different correlational patterns with other variables when parsed into influence versus autonomy components.

In addition, our measures may be associated with psychometric shortcomings that warrant attention in future work. Although our convergent and discriminant validity analyses indicate that our measures effectively distinguish having and wanting elements of power, they may be best understood as “proof of concept” tools rather than as robust measures that can be used in applied (e.g., clinical) settings. Our CFA and EFA analyses indicated that the factor structure of our items is affected, to some degree, with whether items are positively or negatively coded (reverse-worded). Factor analyses of scales with some negatively coded items frequently point to method covariance that obscures or confounds substantive covariance (e.g., Roszkowski & Soven, 2010), and CFAs of such scales often yield inadequate fit unless the models are adjusted to account for keying method variance (e.g., Woods, 2006). Although such method effects can stem from careless responding or other response sets (Woods, 2006), they might also reflect substantive personality variance stemming from self-esteem, narcissistic self-enhancement (e.g., DiStefano & Motl, 2006), or agreeableness. The materials we used in our studies do not allow us to determine whether the keying effects we detected in the factor structures were due to non-substantive artifacts, substantive personality variance, or both.

Additionally, the FP-DP Figures items used in Study 3 were not adequately refined and independently validated and should also be understood as tentative “proof of concept” tools. Although we used two different design families (pyramid hierarchy images and images of a figure surrounded by others), many other kinds of picture designs might profitably be generated to supplement these preliminary efforts. Still, the promising patterns of correlations with a broad

swath of external variables obtained with our picture-based prompts suggest that the development of more robust versions of these measurement tools could be valuable.

Several other limitations point to future fruitful research directions. First, our analyses related to hormones in study 4 were extremely under-powered, particularly for men. Our findings may nonetheless point, although only weakly, to the potential utility of conducting such investigations in larger samples. Second, other studies have assessed power contentment and power hunger, without using those terms, through brief, non-validated sets of questions directly assessing how much power individuals want in comparison with what they have (e.g., Lammers et al., 2016; Williams, Gruenfeld, & Guillory, 2017). This method should be used alongside our residualizing method to ascertain the convergent validity of the two types of approaches in assessing power contentment or hunger.

Taken as a whole, the findings across our four studies, which are largely although not entirely consistent, demonstrate compellingly that desire for power and feeling powerful, although correlated, are meaningfully distinguishable aspects of influence and agency. Failures to distinguish between and conjointly analyze these two aspects of power have probably generated a large number of misleading findings and conclusions in past studies, most notably in regard to relationships with antagonism, egocentricity, empathy, dishonesty, and other variables related to interpersonal and/or moral characteristics. On a deeper theoretical level, our results offer preliminary support for theories of power that point to the psychological importance of relative *power contentment* versus *hunger for power* (e.g., Johnson et al., 2012; Shaver et al., 2011). Further refinements and empirical tests of these kinds of theories should allow the field of power research to gain substantial leverage on a host of important theoretical and research questions.

Footnotes

1. Horn's parallel analysis was not employed when creating our scales, but we conducted this analysis retrospectively in subsequent analyses. Horn's parallel analysis indicated 8 factors, 6 of which were above an eigenvalue of 1 (the Kaiser criterion). This likely indicates that the initial item pool in Study 1 was highly heterogeneous, consistent with our over-inclusiveness in drafting potential items. Retrospectively examining only the items that were selected for our scales, in study 1, Horn's parallel analysis indicated 3 factors, all with eigenvalues above 1. This result was replicated in studies 2 and 3, indicating that the scales used in our studies were reliably characterized by three factors.
2. Retrospectively, we also conducted an EFA extracting 6 factors. This EFA was characterized by separate factors for FP, DP, and AP, with positively coded and negatively coded items for each domain loading as distinguishable factors.

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Table 1. 3-Factor EFA Factor loadings for FP, DP, and AP items.

	Study 1 EFA			Study 3 EFA		
	FP	DP	AP	FP	DP	AP
FP 1. My ideas and opinions are often ignored.* (-)	.70	.36	-	.94	-	-
FP 2. I don't have much power compared to other people. (-)	.67	.36	-	.54	.40	-
FP 3. I feel like a weak person when I express myself to others. (-)	.66	-	-	.76	-	-
FP 4. I have a lot of confidence in my ability to make things happen.	.64	.47	.37	.39	.33	-
FP 5. I can get others to listen to what I say.*	.64	.44	.40	.55	-	-
FP 6. Even if I voice my views, people don't pay attention to them. (-)	.64	-	-	.92	-	-
FP 7. I am very timid around others. (-)	.60	-	-	.73	-	-
DP 1. I have a strong drive to get power.	.37	.75	.44	-	.85	-
DP 2. I like to have power over other people.	-	.70	.35	-	.99	-
DP 3. I would enjoy having authority over people.	.36	.66	.37	-	.87	-
DP 4. I work to control others more than they control me.	-	.64	.45	-	.80	-
DP 5. When I am in a group, I try to have more influence than other people.	.38	.64	.44	-	.69	-
DP 6. I like to tell people what they should do.	-	.63	-	-	.86	-
AP 1. I pay a lot of attention to signs of dominance in people.	-	.35	.74	-	-	.87
AP 2. I immediately can tell who is the "alpha" in the group.	-	-	.71	-	-	.72
AP 3. I have a knack for knowing who is the most powerful person in the group because I notice how others act around them.	-	-	.69	-	-	.83
AP 4. I try to quickly figure out which people have a lot of influence.	-	.38	.69	-	-	.67
AP 5. I always try to spot the dominant people in any situation.	-	-	.67	-	-	.84
AP 6. I always try to know who the "top dog" is in a group.	-	.42	.65	-	-	.74
AP 7. I am quick to notice submissive qualities in people.	-	-	.62	-	-	.76

Note. * designates an item used with permission from the Sense of Power scale (Anderson, John, & Keltner, 2012). **Bolded** = loading above .5. Factor loadings below .30 are not listed. FP = Feeling Powerful. DP = Desire for Power. AP = Attention to Power. Study 1 loadings are from the structure matrix of all 72 initial candidate items. Study 2 loadings are not displayed here given that an FP item was accidentally excluded from that study. Study 3 loadings are from the pattern matrix of only the 20 items retained for scales.

Table 2. Study 1 correlations ($n = 266-271$; MPQ analyses, $n = 166-168$)

	Convergent Validity				Aggression				Empathy		Attachment		
	SOP	PRF Dom	MPQ SP	GSES	BPAQ Anger	BPAQ Hostility	BPAQ Verbal	BPAQ Physical	IRI EC	IRI PT	ECRR Anx	ECRR Avoid	PAI-Bor
FP	.84**	.54**	.55**	.57**	-.01	-.31**^	.23**	.12	.05	.10^	-.41**	-.26**	-.21**^
DP	.46**	.62**	.62**	.37**	.33*	.18*^	.45**	.36**	-.13	-.14^	-.07	-.04	.20*^
<i>Residualized variables (FP and DP after covarying for one another)</i>													
FP res	.72**	.32**	.33**	.46**	-.15	-.41**	.06	-.03	.11	.17*	-.41**	-.26**	-.31**
DP res	.14	.44**	.45**	.16*	.36**	.33**	.39**	.34**	-.16*	-.19*	.09	.07	.30**

Note. ** is $p < 0.001$, * is $p < 0.01$, ^ indicates a statistically significant suppressor effect (bootstrapped moderation with 99% CIs). FP = Feeling Powerful, DP = Desire for Power, res = residualized variable, SOP = Sense of Power Scale, PRF Dom = Dominance scale of the Personality Research Form, MPQ SP = Social Potency scale of the Minnesota Personality Questionnaire - Brief, BPAQ = Buss-Perry Aggression Questionnaire, Verbal = Verbal Aggression, Physical = Physical Aggression, IRI = Interpersonal Reactivity Index, EC = Empathic Concern, PT = Perspective-Taking, ECRR = Experiences in Close Relationships scale - Revised, Anx = attachment anxiety, Avoid = attachment avoidance, PAI-Bor = Borderline Personality scale of the Personality Assessment Inventory

Table 3. Study 2 correlations, minus HEXACO ($n = 386\text{--}388$)

	Convergent Validity					Aggression				Emotional Distress	
	FP	DP	AP	Prestige	Dominance	BPAQ Anger	BPAQ Hostility	BPAQ Verbal	BPAQ Physical	CESD-R	SIAS
FP	-	.35**	.36**	.68**	.37**	-.37**^	-.46**^	-.04^	-.07^	-.45**	-.73**
DP		-	.54**	.40**	.83**	.29**^	.18**^	.35^	.43**^	-.14*	-.26**
<i>Residualized variables (FP and DP after covarying for one another)</i>											
FP res	.94**	.00	.18**	.58**	.07	-.50**	-.56**	-.17**	-.24**	-.43**	-.69**
DP res	.00	.94**	.44**	.17**	.75**	.45**	.37**	.39**	.49**	.02	.00

Note. ** is $p < 0.001$, * is $p < 0.01$, ^ indicates a statistically significant suppressor effect (bootstrapped moderation with 99% CIs).
 FP = Feeling Powerful, DP = Desire for Power, AP = Attention to Power, res = residualized variable, BPAQ = Buss-Perry Aggression Questionnaire, Verbal = Verbal Aggression, Physical = Physical Aggression, CESD-R = Center for Epidemiological Studies Depression scale – Revised, SIAS = Social Interaction Anxiety Scale

Table 4. Study 3 convergent validity correlations ($n = 386$)

	FP Residual	FP Pictures	FP Pictures Residual	DP	DP Residual	DP Pictures	DP Pictures Residual	AP	Power as Life Value
FP	.89**	.59**	.46**	.45**	.00	.38**	.09	.38**	.02^
FP res	-	.46**	.42**	.00	-.45**	.18**	-.06	.11	-.24**
FP Pic		-	.86**	.41**	.16	.51**	.00	.27**	.08
FP Pic res			-	.19**	-.02	.00	-.51**	.09	-.03
DP				-	.89**	.48**	.32**	.62**	.52**^
DP res					-	.35**	.31**	.50**	.58**
DP Pic						-	.86**	.39**	.20**
DP Pic res							-	.29**	.19**

Note. ** is $p < 0.001$, * is $p < 0.01$, ^ indicates a statistically significant suppressor effect (bootstrapped moderation with 99% CIs). FP = Feeling Powerful, DP = Desire for Power, AP = Attention to Power, Pic = pictures-based variable, res = residualized variable

Table 5. Correlations with HEXACO study 2, $n = 331-342$; study 3, $n = 375-384$) [study 3 in parentheses]

	Honesty/Humility	Emotionality	Extraversion	Agreeableness	Conscientiousness	Openness
FP	-.04 [^] (.04 [^])	-.38** (-.21**)	.72** (.73**)	.19** [^] (.17** [^])	.49** [^] (.29** [^])	.26** (.21**)
DP	-.55** [^] (-.47** [^])	-.34** (-.21**)	.39** (.46**)	-.25** [^] (-.18** [^])	.03 [^] (-.03 [^])	.05 (.02)
FP Pic	(.01 [^])	(-.22**)	(.54**)	(.15*)	(.17**)	(.14*)
DP Pic	(-.23** [^])	(-.17*)	(.32**)	(-.03)	(.11)	(.13)
<i>Residualized variables (FP and DP after covarying for one another)</i>						
FP res	.17** (.29**)	-.28** (-.12)	.63** (.58**)	.30** (.28**)	.51** (.34**)	.26** (.23**)
DP res	-.58** (-.55**)	-.22** (-.13*)	.14* (.15*)	-.34** (-.28**)	-.16* (-.18**)	-.04 (-.09)
FP Pic res	(.15*)	(-.16*)	(.44**)	(.19**)	(.14*)	(.09)
DP Pic res	(-.28**)	(-.07)	(.05)	(-.12)	(.03)	(.07)

Note. ** is $p < 0.001$, * is $p < 0.01$, ^ indicates a statistically significant suppressor effect (bootstrapped moderation with 99% CIs). FP = Feeling Powerful, DP = Desire for Power, Pic = pictures-based variable, res = residualized variable

Table 6. Study 3 correlations, minus HEXACO ($n = 355\text{--}386$)

	<u>Emotional Distress</u>			<u>Attachment</u>		<u>Empathy</u>			
	SIAS	PSWQ	CESD-R	ECR-R Anx	ECR-R Avoid	ACME AR	ACME AD	ACME CE	PES
FP	-.73**	-.52**	-.44**	-.48***^	-.41***^	.11^	.10^	.42**	.24**
DP	-.26**	-.24**	-.09	-.02^	-.01^	-.32***^	-.41***^	.15*	.59**
FP Pic	-.50**	-.45**	-.36**	-.35**	-.28**	-.03	-.05	.25**	.23**
DP Pic	-.24**	-.21**	-.12	-.08	-.04	-.09	-.12	.25**	.37**
<i>Residualized variables (FP and DP after covarying for one another)</i>									
FP res	-.69**	-.46**	-.45**	-.53**	-.46**	.28**	.32**	.40**	-.04
DP res	.08	.00	.12	.22**	.20**	-.41**	-.52**	-.05	.54**
FP Pic res	-.44**	-.40**	-.35**	-.36**	-.30**	.02	.02	.13	.05
DP Pic res	.01	.02	.07	.11	.11	-.08	-.12	.15*	.29**

Note. ** is $p < 0.001$, * is $p < 0.01$, ^ indicates a statistically significant suppressor effect (bootstrapped moderation with 99% CIs). FP = Feeling Powerful, DP = Desire for Power, Pic = pictures-based variable, res = residualized variable, SIAS = Social Interaction Anxiety Scale, PSWQ = Penn State Worry Questionnaire, CESD-R = Center for Epidemiological Studies Depression scale – Revised, ECRR = Experiences in Close Relationships scale - Revised, Anx = attachment anxiety, Avoid = attachment avoidance, ACME = Affective & Cognitive Measure of Empathy, AR = Affective Resonance, AD = Affective Dissonance (reverse scored), CE = self-reported cognitive empathy, PES = Psychological Entitlement Scale

Table 7. Power Contentment and Hunger for Power, correlations stronger than $r = .03$ in Studies 1-3 (excluding convergent validity relationships)

Power Contentment (FP Residual)		Hunger for Power (DP Residual)	
External correlate	<i>r</i>	External correlate	<i>r</i>
Social Anxiety (SIAS) ^a	-.69	Honesty/Humility ^a	-.57
Extraversion ^a	.61	Sense of Entitlement	.54
Hostility (BPAQ) ^a	-.49	Empathic Dissonance (ACME AD) (reversed)	-.52
Attachment Anxiety (ECR-R) ^a	-.47	Physical Aggression (BPAQ) ^a	.42
Worry (PSWQ)	-.46	Anger (BPAQ) ^a	.41
Depression (CESD-R) ^a	-.44	Empathic Resonance (ACME AR)	-.41
Conscientiousness ^a	.43	Verbal Aggression (BPAQ) ^a	.39
Mindreading Confidence (ACME CE)	.40	Hostility (BPAQ) ^a	.38
Attachment Avoidance (ECR-R) ^a	-.36	Agreeableness ^a	-.31
Anger (BPAQ) ^a	-.33	Borderline PD Traits (PAI)	.30
Empathic Dissonance (ACME AD) (reversed)	.32		
Borderline PD traits (PAI)	-.31		

Note. ^a indicates mean *r* across multiple studies. SIAS = Social Interaction Anxiety Scale; BPAQ = Buss-Perry Aggression Questionnaire; ECR-R = Experiences in Close Relationships Scale, Revised; PSWQ = Penn State Worry Questionnaire, CESD-R = Center for Epidemiological Studies Depression scale, Revised; ACME = Affective and Cognitive Measure of Empathy; CE = Cognitive Empathy; AD = Affective Dissonance; AR = Affective Resonance; PAI = Personality Assessment Inventory

Figure 1.

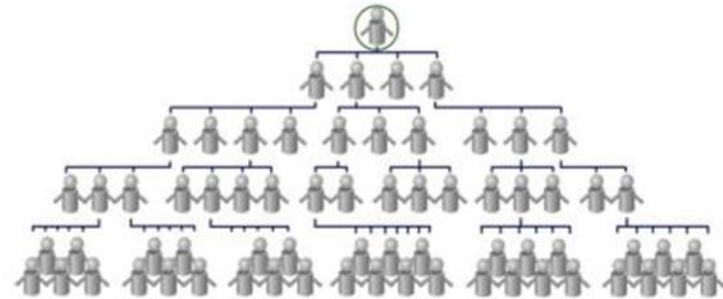
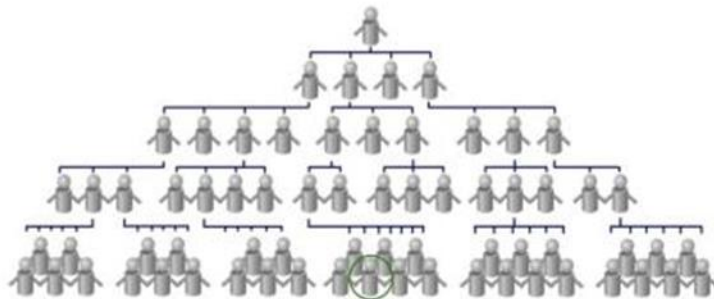
Which purple figure best represents how much power you currently **have**?



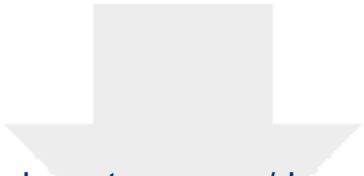
- ☐ Much more like the figure on the left
- ☐ Slightly more like the figure on the left
- ☐ Slightly more like the figure on the right
- ☐ Much more like the figure on the right

Figure 2.

Which circled figure best represents how much power you currently **want**?



- ☐ Much more like the circled figure on the left
- ☐ Slightly more like the circled figure on the left
- ☐ Slightly more like the circled figure on the right
- ☐ Much more like the circled figure on the right



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Supplemental Material

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