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Is Self-Regard a Sociometer or a Hierometer?

Self-Esteem Tracks Status and Inclusion, Narcissism Tracks Status

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We pre-registered Study 2 at the Open Science Framework (https://osf.io/25v8u/). Following Vant'Veer and Giner-Sorolla's (2016) recommendations, we specified in advance our aims, hypotheses, study design, measures, data inclusion/exclusion criteria, as well as data analytic plan. Study 4 was supported by the John Templeton Foundation via the Thrive Center for Human Development [Grant Number IH 113].

Abstract

What adaptive function does self-regard serve? Sociometer theory predicts that it positively tracks social inclusion. A new theory, hierometer theory, predicts that it positively tracks social status. We tested both predictions with respect to two types of self-regard: self-esteem and narcissism. Study 1 (N = 940), featuring a cross-sectional design, found that both status and inclusion covaried positively with self-esteem, but that status alone covaried positively with narcissism. These links held independently of gender, age, and the Big Five personality traits. Study 2 (N = 627), a pre-registered cross-sectional study, obtained similar results with alternative measures of self-esteem and narcissism. Studies 3–4 featured experimental designs in which status and inclusion were orthogonally manipulated. Study 3 (N = 104) found that both higher status and higher inclusion promoted higher self-esteem, whereas only higher status promoted higher narcissism. Study 4 (N = 259) obtained similar results with alternative measures of self-esteem and narcissism. The findings suggest that self-esteem operates as both sociometer and hierometer, positively tracking both status and inclusion, whereas narcissism operates primarily as a hierometer, positively tracking status.

Keywords: social status, social inclusion, self-esteem, narcissism, hierometer theory

Is Self-Regard a Sociometer or a Hierometer?

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We are concerned in this article with the function of *self-regard*. Note that we use "self-regard" as an umbrella term to cover both *self-esteem* and *narcissism*, two distinct ways of evaluating the self. In particular, we test predictions derived from two theories, *sociometer theory* and *hierometer theory*, both of which address self-regard's function.

Sociometer Theory

Sociometer theory posits that self-esteem serves an inclusion-regulating function: Self-esteem forms part of an evolved psychological system to regulate social inclusion (Leary & Downs, 1995; Leary, Tambor, Terdal, & Downs, 1995). The need to belong to groups is fundamental (Baumeister & Leary, 1995). Such belonging enhanced our ancestors' chances of survival and reproduction, by facilitating acquisition of resources, access to mates, sharing of knowledge, and division of labor (Leary & Baumeister, 2000). In general, whenever a particular need (e.g., for nourishment) is critical to an organism's survival, one or more mechanisms is liable to evolve to track its fulfillment or non-fulfillment (e.g., hunger; Buss, 1995). Thus, given that social inclusion was crucial to survival of the species, a psychological mechanism likely evolved to ensure that these social bonds were optimally maintained. Such a mechanism would track levels of inclusion and alert the individual if their need to belong was being unmet, thereby motivating corrective action. According to sociometer theory, the central gear in that mechanism is self-esteem (Leary, 1999, 2005), which operates as an internal gauge to track social inclusion. If so, then acute or chronic signs of being excluded would lower self-esteem, whereas acute or chronic signs of being included would raise it (Figure 1).

Hierometer Theory

A novel theory, hierometer theory, also posits a functional role for self-esteem (Mahadevan, Gregg, Sedikides, & De Waal-Andrews, 2016). It proposes that self-esteem in particular, and self-regard in general, serves a status-regulating function: helping individuals to navigate often precarious status hierarchies. The need to obtain and sustain social status is fundamental (Anderson, Hildreth, & Howland, 2015). Moreover, status hierarchies are

ubiquitous (Sapolsky, 2005). Virtually all human and primate societies exhibit them, according different roles and privileges to group members (Fiske, 2010; Gregg & Mahadevan, 2014; Sidanius & Pratto, 1999).

Given the centrality of status hierarchies to social life, it is plausible that humans evolved to navigate them (Sedikides & Skowronski, 1997; Sedikides, Skowronski, & Dunbar, 2006). Higher status offers numerous advantages, influencing physical health (Marmot, 2004), emotional well-being (Sapolsky, 2005), and reproductive success (von Rueden, Gurven, & Kaplan, 2008). That said, status-seeking is also a risky endeavor, given that status violations are often punished—for instance, with verbal or physical assault (Ridgeway & Berger, 1986). The key evolutionary challenge, therefore, is to navigate social hierarchies judiciously. A psychological mechanism dedicated to tracking one's position in the hierarchy—and regulating one's behavioral readiness to contest status—would thus be of adaptive benefit. According to hierometer theory, the central gear in this mechanism is self-regard, which operates as an internal gauge to track social status. If so, then acute or chronic signs of low status would lower self-regard, whereas acute or chronic signs of high status would raise it (Figure 1).

In summary, sociometer theory and hierometer theory make complementary predictions. The former predicts that higher self-esteem is a product of, and will covary positively with, higher inclusion. The latter posits that higher self-esteem and higher narcissism are products of, and will covary positively with, higher status. Note that, whereas sociometer theory has focused on one form of regard, namely self-esteem (but see Leary & Downs, 1995; Leary & Guadagno, 2011), hierometer theory also encompasses narcissism. To test these predictions, it is therefore necessary to distinguish, first, status from inclusion, and second, self-esteem from narcissism. Hence a preliminary word on both distinctions.

Status and Inclusion

Consistent with current theorizing, we define status as being *respected* and *admired* (Anderson, Kraus, Galinsky, & Keltner, 2012; Magee & Galinsky, 2008), and inclusion as being *liked* and *accepted* (Anderson et al., 2015; Leary et al., 1995). Status is also distinct from power. Whereas power involves control over resources and can entail the use of force,

status involves social standing that is granted rather than grabbed (De Waal-Andrews, Gregg, & Lammers, 2015; Fiske, 2010).

Status and inclusion have some similarities. Both operate in social contexts and involve the appraisals of others. Thus, Robinson Crusoe for example, stranded on a deserted island, could enjoy neither status nor inclusion. Also, among social animals, status and inclusion often co-occur. For example, successful people are frequently liked as well as respected by others (Koch & Shepperd, 2008).[1] Yet, despite such similarities, status and inclusion nonetheless remain conceptually and empirically distinct (Anderson et al., 2015; Bakan, 1966). Each can exist without the other. For example, one can respect someone whom one does not like (an accomplished rival), and like someone whom one does not respect (a friendly buffoon; Huo, Binning, & Molina, 2010). Many groups consist of individuals who are equally well-liked but differ in the level of respect and admiration they command (and vice versa; Anderson et al., 2015; Fournier, 2009). Further, status and inclusion are each theorized to derive from two different motives. Both motives are fundamental and mutually irreducible (Anderson et al., 2015; Baumeister & Leary, 1995).

More generally, the distinction between status and inclusion can be understood as a subset of a broader distinction—that between *agency* and *communion* (the "Big Two"; Bakan, 1966; Gregg, Mahadevan, & Sedikides, 2017; Wojciszke, Baryla, Parzuchowski, Szymkow, & Abele, 2011). The agency-communion distinction encompasses several phenomena. They include: independence-interdependence (Markus & Kitayama, 1991), competence-warmth (Fiske, Cuddy, Glick, & Xu, 2002), dominance-agreeableness (Wiggins, 1979), and need for achievement-need for affiliation (McClelland, 1975). Accordingly, we consider status one manifestation of agency, and inclusion one manifestation of communion. But status and inclusion are not simply reducible to agency and communion. The former are

[1] Additionally, status and inclusion can both vary by domain: A person can have high status or be highly included in one domain (e.g., at home), but have lower status or be less included in another domain (e.g., at work). Nonetheless, people also possess an overall level of status or inclusion—defined respectively as the extent to which they are respected and admired, or liked and accepted, on the whole (Fiske, 2010; Leary et al., 1995).

highly contextualized variables operating in a social environment, whereas the latter represent more generalized properties.

In relevant literatures, status and inclusion have been operationalized via both objective and subjective assessments. Objective assessments include measuring how much someone is respected and admired, or liked and accepted, by fellow members of face-to-face groups (e.g., in a classroom or university fraternity), using either a round-robin design or peer nomination procedure (Anderson, John, Keltner & Kring, 2001; Reitz, Motti-Stefanidi, & Asendorpf, 2016). Here, group members either rate one another on continuous scales, or classify one another as extreme or not (i.e., "most popular" or "most disliked"), with each person serving simultaneously as target and perceiver. Inclusion (but rarely status) has also been objectively manipulated in experimental settings to be either higher or lower via social feedback (Koch & Shepperd, 2008; Leary et al., 2001). In contrast, subjective measures of status and inclusion consist mostly of self-report questionnaires (Gruenewald, Kemeny, & Aziz, 2006; Huo et al., 2010). They typically involve measuring the extent to which people feel, in general, that others respect and admire them, or like and accept them.

Importantly, people are able to determine with reasonable accuracy the extent to which others afford them status and inclusion. That is, reports of both status and inclusion, by self and others, converge (Anderson, Srivastava, Beer, Spataro, & Chatman, 2006; Anderson, Ames, & Gosling, 2008; Fournier, 2009; Jansen, Otten, Van der Zee, & Jans, 2014). Moreover, although status and inclusion correlate positively, both when assessed via self–report and via other–report (Fournier, 2009; Huo et al., 2010), they remain empirically and predictively distinct. In particular, the two show varying degrees of consensus and reciprocity effects (Fournier, 2009), contribute independently to psychological well-being and public engagement (Huo et al., 2010), and motivate different types of behaviors (Anderson et al., 2015).

In summary, consistent with the literature, we define status and inclusion as the extent to which an individual is respected and admired, or liked and accepted, correspondingly. In Studies 1–2, we assess these constructs, defined in this way, subjectively via self-report. Then, in Studies 3–4, we manipulate them objectively via social feedback. We expect them—

as conceptually distinct but empirically correlated constructs—to differentially predict self-esteem and narcissism. Below, we now differentiate these two types of self-regard.

Self-Esteem and Narcissism

We use the terms "self-esteem" and "narcissism" to denote two distinct types of self-regard. Self-esteem can be defined briefly as "a positive or negative attitude toward a particular object, namely, the self" (Rosenberg, 1965, p. 18), or more expansively as "the feeling that one is 'good enough.' The individual simply feels that he is a person of worth; he respects himself for what he is, but he does not stand in awe of himself nor does he expect others to stand in awe of him. He does not necessarily consider himself superior to others" (Rosenberg, 1965, p. 30). But, whereas self-esteem involves relatively realistic self-views, revolving around one's underlying worth or value (Sedikides, Gaertner, & Cai, 2015), narcissism involves more grandiose ones, entailing a sense of entitlement, a proclivity to exploit, and a sensitivity to criticism (Brummelman, Thomaes, & Sedikides, 2016; Krizan & Bushman, 2011). Here, we focus not on clinical narcissism, but on 'normal' narcissism, which, like self-esteem, is conceived as being continuously and normally distributed throughout the population (Krizan & Herlache, 2017; Sedikides & Campbell, 2017).

Self-esteem and narcissism have each been conceptualized and operationalized both at the level of global constructs and at the level of specific dimensions (Leary & Baumeister, 2000; Roberts, Woodman, & Sedikides, 2017). Here, we adopt the former approach. That is, we conceptualize both self-esteem and narcissism as global, unified constructs.[2] Global self-esteem is most frequently measured with the *Rosenberg Self-Esteem Scale* (*RSES*; Rosenberg, 1965), and global narcissism with the *Narcissistic Personality Inventory* (*NPI*; Raskin & Hall, 1979) and its variants (e.g., the *NPI-16;* Ames, Rose, & Anderson, 2006). That said, the underlying factor structure of the NPI has long been debated, with differing views emerging as to the number and nature of its components (Ackerman et al., 2011; Corry, Merritt, Mrug, & Pamp, 2008; Miller, Price, & Campbell, 2012; Raskin & Terry, 1988). Accordingly,

[2] Note that there is no conflict between these "lumping" and "splitting" conceptualizations (Simpson, 1945). That something has parts does not mean it is meaningless to speak of it as a whole. It is rather a matter of different levels of elective conceptual resolution.

alternative operationalizations of narcissism have more recently been developed, including, notably, the *Narcissistic Admiration and Rivalry Questionnaire* (*NARQ*; Back et al., 2013; Leckelt et al., 2017). The NARQ is designed to assess comprehensively narcissistic inclinations towards both assertive self-enhancement and antagonistic self-protection. Together, these encompass the overarching construct of narcissism—its "bright" and "dark" sides, respectively. Likewise, newer measures of global self-esteem have also been developed, such as, the *Lifespan Self-Esteem Scale* (*LSES*; Harris, Donnellan, & Trzesniewski, 2017). The LSES is a brief unidimensional measure of global self-esteem designed for use across the lifespan, including among young children. On all these instruments, overall levels of self-regard are assessed by reversing negatively worded items and then calculating total scores across all items. Accordingly, in this article, when we refer to self-esteem or narcissism, we refer to overall levels of the construct—operationalized as aggregate scores on measures such as these.

Finally, self-esteem has been studied extensively both as an enduring trait and as a transitory state (Sedikides & Gregg, 2003; Zeigler-Hill, 2013). "Trait self-esteem" refers to a person's general or chronic evaluation of themselves—their "average tone of self-feeling" (James, 1890, p. 306). In contrast, "state self-esteem" refers to temporal and fluctuating self-evaluations that vary in response to context. Narcissism has been predominantly studied as a trait; more recently, however, it has begun to be studied as a state too (Giacomin & Jordan, 2016; Horton, Reid, Barber, Miracle, & Green 2014).[3] Here, we use the terms "trait" and "state" to qualify both self-esteem and narcissism as appropriate. Accordingly, we use the term "trait narcissism" to refer to general or chronic levels of narcissism, and the term "state narcissism" to refer to temporal and fluctuating levels of narcissism. In Studies 1–2 we assess self-esteem and narcissism as traits, whereas in Studies 3–4 we assess them as states.

The Sociometer and Hierometer Literatures

Consistent with sociometer theory, self-esteem has been found to track social inclusion. Overall levels of inclusion correlate positively with trait self-esteem (Denissen,

[3] Again, note that such definitions are not at odds, but merely reflect different levels of elective temporal resolution.

Penke, Schmitt, & Van Aken, 2008; Leary et al., 1995), and changes in inclusion cause corresponding changes in state self-esteem (Bourgeois & Leary, 2001; Koch & Sheppard, 2008). For example, being rejected by others, or imagining that one is, lowers state self-esteem, whereas being accepted by others, or imagining that one is, raises it (Leary, Haupt, Strausser, & Chokel, 1998; Zadro, Williams, & Richardson, 2004). Also, the degree to which people are liked and accepted by others, or believe themselves to be liked and accepted by others, overall, correlates positively with trait self-esteem (Leary et al., 1995; Reitz et al., 2016). Thus, the degree to which people are socially included affects self-esteem in a positive direction, just as sociometer theory contends.

However, given that several studies have confounded inclusion with status, these effects might partially reflect the input of status. For example, the set of 16 hypothetical events assessed by Leary et al. (1995) featured items that pertained more directly to status than inclusion, such as: "I dropped out of *college*," "I received a negative evaluation on my *work performance* from my *boss*," and "I was accepted into an *honor society*" (italics added). Likewise, the acceptance manipulations used by Koch and Sheppard (2008) featured the items, "I have strong *admiration* for my friend," "I have tremendous *respect* for my friend," and "I am *proud* of my friend" (Study 1 [italics added]), and the items "I think that my interaction partner is one of those people who quickly wins *respect*," and "It seems to me that it is very easy for my interaction partner to gain *admiration*" (Study 2 [italics added]). Pride, admiration, and respect more closely reflect status than inclusion (Anderson et al., 2015; Fiske, 2010). Thus, although self-esteem ostensibly tracks inclusion, the effects attributed to inclusion in these studies might partially reflect status.

As regards hierometer theory, no experimental research has yet been conducted to explicitly test its tenets. Nonetheless, several studies show that changes in constructs related to status (e.g., dominance, competence, academic success) do give rise to corresponding changes in state self-esteem (Crocker, Sommers, & Luhtanen, 2002; Koch & Shepperd, 2008; Leary, Cottrell, & Phillips, 2001). This suggests that self-esteem might indeed track status. Additionally, socioeconomic status correlates positively with trait self-esteem, as does being respected and admired by one's peers (Huo et al., 2010; Twenge & Campbell, 2002).

Moreover, there are indications that the type of self-regard involved makes a difference. Specifically, self-esteem might function both as a hierometer that tracks status positively, and a sociometer that tracks inclusion positively. In contrast, narcissism might function primarily as a hierometer that tracks status positively. Consistent with this possibility, both trait self-esteem and trait narcissism correlate positively with agentic traits (e.g., *strong*, *intelligent*), whereas trait self-esteem but not trait narcissism correlates positively with communal traits (e.g., *kind*, *helpful*; Campbell, Rudich, & Sedikides, 2002; Krizan & Bushman, 2011). Most relevantly, two cross-sectional studies by Mahadevan et al. (2016) found that both status and inclusion independently predicted trait self-esteem positively, whereas status but not inclusion independently predicted trait narcissism positively.

The Mahadevan et al. (2016) investigation, however, left several questions unanswered. First, it did not examine whether the links predicted by sociometer and hierometer theory were observed across individuals who differed on key demographics, such as gender and age, or across key personality traits, such as the Big Five (John & Srivastava, 1999). Second, it utilized only a single operationalization of the key constructs. Third, and most important, although its cross-sectional design could furnish evidence consistent or inconsistent with sociometer and hierometer theory—and therefore provisionally support or contradict them (Baumeister, Campbell, Krueger, & Vohs, 2003)—it could not test their causal tenets directly.

In summary, the studies reviewed above had one or more of the following limitations: (a) they did not expressly assess status or inclusion; (b) they confounded status and inclusion; (c) they did not assess narcissism alongside self-esteem; (d) they did not control for some potential confounds; or (e) they relied solely on cross-sectional designs. Thus, the functions of each type of self-regard remain unclear.

Contribution of the Present Research

We hypothesize the following. First, self-esteem operates as both a hierometer and a sociometer—one that independently tracks higher or rising levels of both status and inclusion. Second, and in contrast, narcissism operates as a hierometer—one that

independently tracks higher or rising levels of status. Accordingly, we derive the following testable predictions: status will positively predict self-esteem independently of inclusion; inclusion will positively predict self-esteem independently of status; status will positively predict narcissism independently of inclusion; and inclusion will not positively predict narcissism independently of status. We summarize these predictions in Table 1.

In doing the above, the present research goes beyond past work, and makes new intellectual headway. In particular, hierometer theory addresses important theoretical gaps in sociometer theory and offers new insights.

First and foremost, hierometer theory delineates a *novel function for self-regard*. Whereas sociometer theory emphasizes social inclusion, hierometer theory emphasizes social status. That is, whereas sociometer theory proposes that self-regard serves an inclusion-regulating function, tracking social inclusion and motivating inclusion-optimizing behavior, hierometer theory proposes that self-regard serves a status-regulating function, tracking social status and motivating status-optimizing behavior. This emphasis on status in hierometer theory, as opposed to inclusion in sociometer theory, is crucial: it draws attention to the "vertical" relationships that exist within social groups that may complement or qualify the "horizontal" ones. Indeed, so far the literature has focused almost exclusively on the latter. By contrast, the role played by status has been neglected; virtually no studies have examined the causal impact of status on self-regard, and none the independent impact of status and inclusion. By specifying precisely how (social) status and (psychological) self-regard might interact as part of an evolutionarily adaptive system, hierometer theory breaks new ground.

Second, there exist two versions of sociometer theory, and hierometer theory *usefully addresses the gaps in each*. The original version posits that self-esteem tracks social inclusion specifically (Leary et al., 1995; Leary & Downs, 1995). The revised version posits that self-esteem tracks "relational value" generally (Leary, 2005). Each version possesses an advantage and a disadvantage that the other lacks. The original version has the advantage of specificity: It marks precisely an inclusion-tracking function for self-esteem. At the same time, it has the disadvantage of not taking into account other plausible factors that affect self-esteem (e.g., status). The revised version, in contrast, has the advantage of accommodating a

broader basis for self-esteem. At the same time, it has the disadvantage that it is vague and non-committal as to exactly what relational variable self-esteem tracks. Critically, neither version of sociometer theory mentions status, nor posits that self-regard serves a status-tracking function. By explicitly articulating a status-tracking function for self-regard, hierometer theory complements the predictions of the original version of sociometer theory, and clarifies those of the revised version.

Third, hierometer theory goes beyond sociometer theory to *posit and investigate a functional role for narcissism*. The sociometer literature has focused predominantly on one type of self-regard, self-esteem; nonetheless, narcissism gains an occasional mention (Leary & Downs, 1995; Leary & Guadagno, 2011). When it does, an attempt is made to explain narcissism in terms of dysfunction. Narcissism is characterized as the sign of a miscalibrated sociometer whose needle is stuck at a permanently high level. In particular, narcissists are thought to believe that "others regard them more favorably and accept them more enthusiastically than is, in fact, the case" (Leary & Downs, 1995, p.138). However, this characterization arguably amounts to a concession that narcissism only makes sense when the predictions of sociometer theory are falsified. Here, we propose and test an alternative possibility at odds with the sociometer hypothesis: that some forms of self-regard do *not* track social inclusion in the way that sociometer theory describes. Being liked and accepted might not be the only reason people feel better about themselves. Narcissistic self-regard might serve a different function. It might operate as a hierometer, tracking status, with higher status predicting and promoting greater narcissism. By specifying and testing an alternative and constructive function of narcissism, hierometer theory potentially challenges existing perspectives on belonging and self-regard, and adds to a growing literature that considers whether narcissism serves some adaptive function, as opposed to presuming that it is a purely pathological phenomenon (Holtzman & Strube, 2011; Sedikides & Campbell, 2017).

Finally, the present investigation *goes substantially beyond past work methodologically*. First, whereas past research has often operationalized key constructs in only one way, our research features multiple measures of the key constructs. Second, the present investigation explores potential boundary conditions of the applicability of both

theories for the first time. Specifically, we test whether, and to what extent, the links specified by sociometer and hierometer theory are moderated by key demographic and personality characteristics, thereby shedding light on the robustness and generalizability of these links.

Third and most important, the present investigation provides the inaugural causal test of hierometer theory. In proposing that self-esteem and narcissism track status, hierometer theory asserts not only that these constructs interrelate, but also that these relationships are causal. The present investigation aims to demonstrate, for the first time, the causal mechanisms critical for hierometer theory. Fourth, the present investigation breaks new ground by furnishing parallel causal tests of sociometer and hierometer theory, thus permitting a matched side-by-side comparison of their empirical performance. Fifth and final, no studies have yet explored the independent causal impact of status and inclusion on two types of self-regard. The present investigation does so for the first time. It examines the independent causal impact of status and inclusion on both self-esteem and narcissism, providing insight into these unique effects.

In all, the present investigation provides a highly systematic and rigorous empirical test of the key tenets of hierometer and sociometer theory, hitherto unattempted. It tests these predictions in large studies (combined $N \approx 2{,}000$), using both correlational and experimental methods, at the level of both states and traits, and with theoretically-derived, comprehensive, and well-matched measures of the constructs. The findings may have broad relevance, not only for social and personality psychology, but also for evolutionary, developmental, and educational psychology.

Overview

We conducted four studies. Study 1, featuring a cross-sectional design, assessed the replicability and robustness of the links specified by hierometer and sociometer theory, first examined by Mahadevan et al. (2016). It also explored how variations in key demographic and personality characteristics might change the picture. For example, some research suggests that men are primarily driven by status, and women by inclusion (Abele & Wojciszke, 2007), whereas other research suggests that women's status aspirations are equal

to men's (Hays, 2013). Also, some research suggests that older people's self-esteem is more rooted in inclusion than that of younger people (Gebauer, Wagner, Sedikides, & Neberich, 2013). So, do gender and age moderate whether status and inclusion predict self-esteem and narcissism? And are these links moderated by personality characteristics known to covary with self-esteem and narcissism (Lee & Ashton, 2005)? The presence of such moderations would refute neither theory, given that neither theory requires that the predicted links obtain equally strongly across individuals. Nonetheless, knowing whether such moderations are present would help to clarify how generally the theories apply, how strongly versus weakly their predictions are borne out, and whether and to what extent boundary conditions can be identified. If the predicted links were to persist independently of the prominent factors considered, confidence in the robustness and generalizability of hierometer theory and sociometer theory would increase. Additionally, Study 1 checked whether, consistent with literature on the Big Two, status and inclusion constitute empirically distinct constructs.

Study 2 examined whether the Study 1 findings generalized in a further way, namely, across different operationalizations of self-esteem and narcissism. Whereas Study 1 used the leading questionnaire measures of both constructs, the RSES and the NPI-16, Study 2 implemented more recently developed alternatives, the LSES and the NARQ. Furthermore, to provide a yet more stringent test of our predictions, Study 2 was pre-registered (https://osf.io/25v8u/), with the hypotheses, method, and data analytic plan specified in advance.

Whereas Studies 1-2 sought to establish external validity, Studies 3-4 sought to establish internal validity. They took the form of classic laboratory experiments (Frey & Gregg, 2017), best suited to testing the causality of the links specified by hierometer and sociometer theory. They examined the independent causal impact of status and inclusion on both self-esteem and narcissism. Study 3 systematically deconfounded status and inclusion, manipulating them orthogonally to assess their independent impact on self-esteem and narcissism. Study 4 did the same with alternative state-like measures of self-esteem and narcissism. All four studies operationalized status and inclusion using comprehensive, theoretically-derived, and well-matched measures and manipulations, to ensure that the

effects were maximally comparable.

For Study 1, we sampled a large number of participants to detect potentially small effects and examine complex moderation relationships. We aimed to recruit 1,000 participants to detect effects of slightly below $r = 0.10$ with a power of 0.80. For Study 2 (pre-registered), we aimed to recruit 600 participants to detect effects of slightly below $r = 0.15$ with a power of 0.95. For Study 3, we aimed to recruit 100 participants (50 per condition) to detect effect sizes of $d = 0.55$ with a power of 0.80. For Study 4, we aimed to recruit 250 participants (125 per condition) to detect effect sizes of $d = 0.35$ with a power of 0.80. All studies received ethics approval from the Research Ethics Committee of the University of Southampton, United Kingdom (Study 1: ID = 459, Study 2: ID = 26708, Study 3: ID = 764, and Study 4: ID = 3789).

Study 1

Study 1 tested predictions derived from hierometer and sociometer theory at the level of enduring conditions and dispositional traits. It examined whether higher levels of status and inclusion independently predict greater trait self-esteem, but only higher levels of status independently predict greater trait narcissism. It also examined whether and to what extent these links were moderated by gender, age, and the Big Five personality traits of extraversion, neuroticism, agreeableness, conscientiousness, and openness. Finally, it assessed whether, consistent with the Big Two literature, status and inclusion were empirically distinct constructs.

Method

Participants. Participants ($N = 1{,}047$) were recruited via *Mechanical Turk*^{TM}. Adults proficient in English, of any nationality, were eligible. We excluded some participants (10.2%) for the following a priori reasons: being aged under 18 (0.4%); reporting poor or very poor English proficiency (0.4%); having duplicate IP addresses (3.0%); completing the study too rapidly, in less than half the median completion time (2.5%); omitting over 5% of questionnaire items (2.4%); and completing all items identically on any questionnaire containing both forward-scored and reverse-scored items (3.0%). The final sample comprised 940 participants (472 female, 468 male; $M_{AGE} = 30.34$ years, $SD_{AGE} = 10.51$) from over 60

countries (USA: 58.9%, India: 12.0%, Canada: 5.1%, UK: 4.1%, Pakistan: 2.0%, Germany: 1.2%, Philippines: 1.2%, Romania: 1.2%, Spain: 0.9%, Australia: 0.7%, Brazil: 0.6%, Macedonia: 0.6%, Malaysia: 0.6%, Portugal: 0.6%, Serbia: 0.6%, Singapore: 0.6%, Indonesia: 0.5%, Venezuela: 0.5%, Other: 8.1%).

Measures. Participants completed measures of their status, inclusion, self-esteem, and narcissism, along with basic demographics and personality. We assessed participants' status and inclusion in parallel formats, with carefully-matched and structurally-validated questionnaires. We expanded both questionnaires from Huo et al. (2010) adding items to capture the constructs more fully and reliably. Both began with the stem "Most of the time I feel that people…" and consisted of a stem completion (1 = *strongly disagree*, 5 = *strongly agree*).

Status. We assessed status with a 10-item questionnaire. Five items were developed by Huo et al. (2010): "respect my achievements," "value my opinions and ideas," "approve of how I live my life," "think well of how I conduct myself," and "think highly of my abilities and talents." We added a further five: "admire me," "consider me a success," "look up to me," "see me as an important person," and "consider me a high-status individual."

Inclusion. We assessed inclusion with a 10-item questionnaire. Four items were developed by Huo et al. (2010): "like me as a person," "feel warmly towards me," "consider me to be a nice person to have around," and "don't like me" (R). We added a further six: "include me in their social activities," "are happy for me to belong to their social groups," "accept me," "see me as fitting in," "approve of my behavior," and "would be willing to be friends with me."

Self-esteem. We assessed self-esteem with the 10-item RSES (Rosenberg, 1965; 1 = *strongly disagree,* 5 = *strongly agree*). The RSES is the most widely used global self-esteem measure (Byrne, 1996). It features equal numbers of forward- and reversed-scored items, exhibits high internal consistency, and shows good convergent and discriminant validity (Schmitt & Allik, 2005). Sample item: "I feel that I have a number of good qualities."

Narcissism. We assessed narcissism with the NPI-16 (Ames et al., 2006), the 16-item version of the *Narcissistic Personality Inventory* (*NPI*; Raskin & Terry, 1988). The NPI-16 is

a widely used global narcissism measure (Twenge, Konrath, Foster, Campbell, & Bushman, 2008). Its items were selected to represent the core construct of narcissism and to cover a range of narcissistic features identified by Emmons (1987) and Raskin and Terry (1988) (Ames et al., 2006). It is reliable and validated (Gentile et al., 2013; but see Corry et al., 2008).

Originally, the NPI and NPI-16 featured a dichotomous forced-choice format. On each item, participants chose between a narcissistic and a non-narcissistic option (e.g., "I know that I am good because everybody keeps telling me so" vs. "When people compliment me I sometimes get embarrassed"). We converted this dichotomous format into a continuous one using a horizontal slider with response options ranging from 1-6. We retained all 32 statements (i.e., two per NPI item) of the original scale. We then reverse-scored the non-narcissistic items and averaged all items to arrive at a total narcissism score. Higher scores indicated greater narcissism. Note that, because the slider contained an even number of scale points, participants were still obliged to opt in the direction of either higher or lower narcissism; they could not select the scale mid-point. Thus, the forced-choice element of the original scale was retained. Similar assessment formats have been used in prior research on narcissism (Lee, Gregg, & Park, 2013; Pincus et al., 2009; Wetzel, Roberts, Fraley, & Brown, 2016), and recent studies suggest that they may afford greater intrinsic and convergent validity (Ackerman, Donnellan, Roberts, & Fraley, 2016; Grosz et al., 2017).

Personality. We assessed the Big Five personality traits with the Ten-Item Personality Inventory (TIPI), a well-validated and frequently used measure (Gosling, Rentfrow, & Swann, 2003; 1 = *strongly disagree*, 5 = *strongly agree*).

Results

Factor analysis. To examine whether status and inclusion were empirically distinct constructs, we conducted an exploratory factor analysis of all status and inclusion items, using Principal Axis Factoring with Direct Oblimin rotation. The analysis revealed three factors with eigenvalues above 1, together accounting for 54% of the variance. All inclusion items, except one, loaded onto Factor 1. All status items, except two, loaded onto Factor 2. The three delinquent items loaded separately onto a third factor (Table 2). They were

thematically distinct, involving approval: "approve of how I live my life," "think well of how I conduct myself," and "approve of my behavior." Hence, we discarded them. We then computed the status and inclusion scales by averaging the remaining status and inclusion items to produce total scores for status and inclusion, respectively. Higher scores indicated greater levels of each construct. The resulting status and inclusion scales, whose items had loaded on two separate factors, comprised eight and nine items respectively, and showed high internal consistency (Table 3). Thus, status and inclusion constituted empirically different constructs.

Correlations. In Table 3, we present the descriptive statistics, reliabilities, and correlations between the main variables. We focused on the links among status, inclusion, self-esteem, and narcissism. Initially, both status and inclusion correlated positively with self-esteem. Both also correlated positively with narcissism.[4]

To test the hypothesized links among the constructs (Table 1), we computed the relevant partial correlations. After controlling for inclusion, status continued to predict positively self-esteem, $r(937) = .30$, $p < .001$. Status also continued to predict positively narcissism, $r(937) = .31$, $p < .001$. After controlling for status, inclusion continued to predict positively self-esteem, $r(937) = .31$, $p < .001$. However, it no longer predicted positively narcissism, $r(937) = .01$, $p = .865$. Thus, consistent with self-esteem operating as both a hierometer and a sociometer, it independently tracked both status and inclusion in a positive direction. By contrast, consistent with narcissism operating predominantly as a hierometer, it independently tracked status, but not inclusion, in a positive direction.

Structural equation models. We also tested all hypotheses at once in a pair of structural equation models. In both models, we entered status and inclusion as predictors, and self-esteem and narcissism as outcome variables, inserting paths from status and inclusion to self-esteem and narcissism. We allowed status and inclusion to correlate, and, likewise, self-

[4] To verify that the correlation between status and narcissism was not due to an overlap in their items (i.e., was not tautological), we examined the correlation between the individual status items and narcissism. Each of the status items individually correlated positively with narcissism. Correlations ranged in magnitude from $r = .17$ to $r = .35$, ps $< .001$. Hence, the positive link between status and narcissism was not driven by any particular item.

esteem and narcissism. We standardized all variables. In Model 1, we entered each of the four constructs—status, inclusion, self-esteem, and narcissism—as manifest variables (Kline, 2005). In Model 2, we represented each of the four constructs—status, inclusion, self-esteem, and narcissism—as latent variables loading on their constituent scale items (Kline, 2005).

The models yielded similar results. Model 1 showed that status predicted self-esteem positively (B = .32, *S.E.* = .03, t(934) = 9.64, p < .001). Status also predicted narcissism positively (B = .36, *S.E.* = .04, t(934) = 9.85, p < .001). Inclusion predicted self-esteem positively too (B = .32, *S.E.* = .03, t(934) = 9.89, p < .001). However, inclusion did not predict narcissism positively (B = .01, *S.E.* = .04, t(934) = 0.17, p = .865). Likewise, Model 2 showed that status predicted self-esteem positively (B = .37, *S.E.* = .05, t(891) = 7.78, p < .001). Status also predicted narcissism positively (B = .37, *S.E.* = .05, t(891) = 8.23, p < .001). Inclusion predicted self-esteem positively too (B = .33, *S.E.* = .04, t(891) = 7.85, p < .001). However, inclusion did not predict narcissism positively (B = -.01, *S.E.* = .04, t(891) = -0.22, p = .830). Thus, the pattern of results obtained using structural models dovetailed with that of the partial correlations.

Moderations by demographics and dispositions. Finally, we examined whether, and to what extent, differences in key demographic or personality characteristics affect these links. We regressed onto each of our self-regard measures the twin theoretical predictors of status and inclusion at Step 1; the predictors of gender, age, and the Big Five at Step 2; and the cross-product interaction terms derived from both sets of predictors reflective of potential moderation at Step 3 (Tables 4-5).

As regards self-esteem, both the status–self-esteem link and the inclusion–self-esteem link remained significant in the relevant regressions (Table 4). Some moderation also emerged. First, the status–self-esteem link was moderated by extraversion: It was stronger among introverts. Second, the inclusion–self-esteem link was moderated by age, agreeableness, and openness: It was stronger among younger, more agreeable, and more close-minded people. We probed these interactions further using the Johnson-Neyman technique (Johnson & Neyman, 1936), which identifies the interval of scores on the moderator for which the link between the predictor and outcome is significant. The Johnson-

Neyman significance region (α = .05, two-sided) indicated that the status–self-esteem link was significant for all levels of extraversion except the top 8.6%, *J-N* = [-∞; 1.32]. The inclusion–self-esteem link was significant across all ages except the top 12.9%, *J-N* = [-∞; 1.29], for all levels of agreeableness except the bottom 15.3%, *J-N* = [-0.84; +∞], and for all levels of openness except the top 10.1%, *J-N* = [-∞; 1.22]. Thus, these moderations were limited in scope. No other moderations attained significance. The links specified by hierometer and sociometer theory held generally across people of varying demographics and dispositions.

As regards narcissism, the status–narcissism link remained significant, and the inclusion–narcissism link remained non-significant, in the relevant regressions (Table 5). Neither age nor personality moderated these links. Gender moderated both the status–narcissism and the inclusion–narcissism links, albeit without altering the general pattern of findings. Specifically, the status–narcissism link was significant among both women and men, respective βs = .38 and .14, both *p*s < .001, and the inclusion–narcissism link was non-significant among both women and men, respective βs = -.10 and .07, *p*s > .05. The links specified by hierometer and sociometer theory held generally across people of varying demographics and dispositions.

Discussion

Study 1 tested predictions derived from hierometer and sociometer theory in a large and diverse sample, at the level of enduring conditions or dispositional traits. Status and inclusion were distinct constructs, and they each positively predicted self-esteem, independent of one another. A different picture emerged for narcissism. After controlling for inclusion, status continued to predict positively narcissism, but after controlling for status, inclusion no longer positively predicted narcissism. Hence, not all forms of self-regard appear to function as sociometers. The data are consistent with self-esteem functioning as both a hierometer and a sociometer, but with narcissism functioning primarily as a hierometer.

These results substantially extend those of Mahadevan et al. (2016). The hypothesized links remained significant after controlling for gender, age, and the Big Five. Moreover, the links were largely unmoderated by them. The status and self-esteem link was significant for

both women and men, across age groups, and across personality dispositions—being moderated only by extraversion. The inclusion and self-esteem link was significant for both women and men—being moderated by age, agreeableness, and openness. All moderations, however, were limited in scope (highest β = .13, for moderation of the inclusion and self-esteem link by agreeableness). The status and narcissism link was significant for both women and men, across age groups, and across personality dispositions. The inclusion and narcissism link was non-significant for both women and men, across age groups, and across personality dispositions. Taken together, these results suggest that self-esteem serves both a sociometric and a hierometric function, tracking both status and inclusion in a positive direction, whereas narcissism serves only a hierometric function, tracking status but not inclusion in a positive direction.

Study 2

Both self-esteem and narcissism qualify as forms of self-regard. To assess both, in Study 1, we duly used the leading instruments in the field: the RSES (Rosenberg, 1965), and (the 16-item version of) the NPI (Ames et al., 2006). The purpose of Study 2 was to test our hypotheses using alternative measures of self-regard, which were more recently developed and validated. Accordingly, we assessed trait self-esteem with the LSES (Harris et al., 2017), and trait narcissism with the NARQ (Back et al., 2013).

The LSES is a short new measure of global self-esteem. It is designed for use across the lifespan, to be suitable for a wide range of age groups. The LSES correlates well with established measures of self-esteem, such as the RSES (Rosenberg, 1965), the *Self-Description Questionnaire* (global subscale: Marsh, 1990), and the *Single-Item Self-Esteem Scale* (Robins, Hendin, & Trzesniewski, 2001). It also shows good internal consistency and criterion-related validity, correlating positively with extraversion and life satisfaction, and negatively with neuroticism and depression (Harris et al., 2017).

The NARQ is a new, comprehensive measure of narcissism. It assesses several facets of narcissism that together encompass the interrelated behavioral dynamics of assertive self-promotion (labelled as “narcissistic admiration”) and antagonistic self-protection (labelled as “narcissistic rivalry”) of narcissism. Additionally, compared to the NPI and its variants,

which may predominantly assess the adaptive or "healthy" aspects of narcissism (Cain, Pincus, & Ansell, 2008), the NARQ is thought to capture aspects of narcissistic grandiosity and narcissistic fragility, the so-called "bright and dark sides of narcissism" (Back et al., 2013). Its psychometric properties equal or exceed those of the NPI (Leckelt et al., 2017).

We pre-registered this study at the Open Science Framework (https://osf.io/25v8u/). Following Van t'Veer and Giner-Sorolla's (2016) recommendations, we specified in advance our aims, hypotheses, study design, measures, data inclusion/exclusion criteria, as well as data analytic plan.

Method

Participants. Participants (N = 743) were recruited via *Mechanical Turk*^{TM}. Adult U.S. residents, proficient in English, were eligible. Again, we excluded participants, if: they were under 18 (0.0%); reported poor English proficiency (0.1%); had duplicate IP addresses (11.0%); completed the study too rapidly (0.5%); omitted over 5% of questionnaire items (2.2%); or showed stereotyped responses (4.3%). The final sample comprised 627 participants (313 female, 313 male, one gender unreported; M_{AGE} = 36.49 years, SD_{AGE} = 11.54). The majority were White (White: 78.8%, East Asian: 7.3%, Hispanic: 5.8%, Black: 5.6%, Other Asian: 1.4%, Other: 1.1%).

Measures. Participants completed measures of their status, inclusion, self-esteem, and narcissism in counterbalanced order, along with basic demographics. We assessed participants' status and inclusion with the eight- and nine-item questionnaires adopted in Study 1 (Huo et al., 2010; Mahadevan et al., 2016). As before, both measures featured 5-point response scales (1 = *strongly disagree,* 5 = *strongly agree*).

Self-esteem. We assessed self-esteem with the 4-item LSES (Harris et al., 2017), a global self-esteem measure relevant to people of all ages. Items are: "How do you feel about yourself?", "How do you feel about the kind of person you are?", "When you think about yourself, how do you feel?", and "How do you feel about the way you are?" Responses ranged from 1 (*really sad*) to 5 (*really happy*).

Narcissism. We assessed narcissism with the 18-item NARQ (Back et al., 2013), a global narcissism measure. It has good internal consistency, test-retest reliability, convergent

validity, and discriminant validity (Back et al., 2013). Sample items are: "I am great," "I manage to be the center of attention with my outstanding contributions," "I often get annoyed when I am criticized," and "I can barely stand it if another person it at the center of events." Responses ranged from 1 (*not agree at all*) to 6 (*agree completely*).

Results

We display in Table 6 the descriptive statistics, reliabilities, and zero-order correlations between the main variables. Initially, both status and inclusion predicted self-esteem positively. Both also predicted narcissism positively.

To examine the hypothesized links among the constructs (Table 1), we computed the relevant partial correlations. After controlling for inclusion, status continued to predict self-esteem positively, $r(624) = .42$, $p < .001$. Status also continued to predict narcissism positively, $r(624) = .40$, $p < .001$. After controlling for status, inclusion continued to predict self-esteem positively, $r(624) = .35$, $p < .001$. However, it no longer predicted narcissism positively: rather, it predicted it negatively, $r(624) = -.22$, $p < .001$. Thus, consistent with self-esteem operating as both a hierometer and a sociometer, both status and inclusion predicted it positively. By contrast, consistent with narcissism operating predominantly as a hierometer, status alone predicted it positively.

Finally, we again tested all hypotheses at once in a pair of structural equation models. As in Study 1, we allowed status and inclusion to correlate, and, likewise, self-esteem and narcissism. We standardized all variables. In both models, we entered status and inclusion as predictors, and self-esteem and narcissism as outcome variables, inserting paths from status and inclusion to self-esteem and narcissism. In Model 1, we entered each of the four constructs as manifest variables; in Model 2, we represented each of the four constructs as latent variables loading on their constituent scale items (Kline, 2005).

The models yielded similar results. Model 1 showed that status predicted self-esteem positively ($B = .44$, *S.E.* $= .04$, $t(621) = 11.66$, $p < .001$). Status also predicted narcissism positively ($B = .54$, *S.E.* $= .05$, $t(621) = 11.05$, $p < .001$). Inclusion predicted self-esteem positively too ($B = .35$, *S.E.* $= .04$, $t(621) = 9.20$, $p < .001$). However, inclusion predicted narcissism negatively ($B = -.27$, *S.E.* $= .05$, $t(621) = -5.55$, $p < .001$). Likewise, Model 2

showed that status predicted self-esteem positively (B = .56, $S.E.$ = .06, t(582) = 9.40, p < .001). Status also predicted narcissism positively (B = .21, $S.E.$ = .04, t(582) = 5.34, p < .001). Inclusion predicted self-esteem positively too (B = .41, $S.E.$ = .06, t(582) = 7.25, p < .001). However, inclusion predicted narcissism negatively (B = -.14, $S.E.$ = .03, t(582) = -4.51, p < .001). Thus, the pattern of results obtained using structural models dovetailed with that obtained using partial correlations.

Discussion

Study 2 re-tested key predictions from hierometer and sociometer theory with recently developed alternative measures of self-regard. As hypothesized, status predicted positively self-esteem, independently of inclusion. Likewise, inclusion predicted positively self-esteem, independently of status. Also as hypothesized, status predicted positively narcissism, independently of inclusion, whereas inclusion did not do so, independently of status. Thus, consistent with self-esteem operating as both a hierometer and sociometer, it tracked both status and inclusion in a positive direction. Consistent with narcissism operating only as a hierometer, it tracked only status but not inclusion in a positive direction.

However, one finding did diverge slightly from Study 1. In Study 1, after controlling for status, inclusion was unrelated to narcissism, whereas, in Study 2, it correlated negatively with narcissism. This negative partial correlation was not inconsistent with our predictions, yet is an interesting secondary finding. We discuss the matter further in the General Discussion.

Study 3

Both sociometer and hierometer theory make predictions that are testable, not only at the level of enduring conditions or traits, but also at the level of temporary conditions or states. In particular: If self-esteem operates as both hierometer and sociometer, tracking status and inclusion, then changes in status and inclusion should induce corresponding changes in state self-esteem. Higher status and higher inclusion should lead to higher self-esteem. Furthermore: If narcissism operates as a hierometer, tracking status, then changes in status but not inclusion should induce corresponding changes in state narcissism. Higher status, but not higher inclusion, should lead to higher narcissism. Study 3 tested these predictions.

Moreover, to do so, it adopted a stronger experimental design to examine the independent causal impact of status and inclusion on both self-esteem and narcissism.

In order to compare optimally the independent causal impact of status and inclusion, their manipulations should also meet three conditions. First, the manipulations should capture the constructs as accurately as possible. Past research has often confounded status and inclusion, making it difficult to determine which effects should be validly attributed to each. Second, the manipulations should be orthogonal. In everyday life, status and inclusion often co-occur. Although researchers have manipulated either status alone, or inclusion alone, none has yet, to our knowledge, unambiguously and expressly manipulated both simultaneously, nor looked at the effects of both on self-esteem and narcissism simultaneously. Third, the manipulations should be appropriately matched. That is, to permit a valid comparison of their effects, the manipulations of status and inclusion should be otherwise equivalent in all relevant respects.

As mentioned above, published work does not yet meet these conditions. Studies to date have not assessed status and inclusion per se, have not assessed narcissism, and/or have used manipulations that were unmatched or confounded the constructs.

For example, Koch and Shepperd (2008) evaluated the independent effects of competence and acceptance on state self-esteem. However, their construct operationalizations were unmatched in the following respects: (a) the competence feedback was computer-generated and therefore impersonal, whereas the acceptance feedback was provided by a friend and therefore personal; (b) the competence feedback consisted of a percentile score, whereas the acceptance feedback consisted of ratings on a scale; and (c) the competence feedback consisted of a single score, whereas the acceptance feedback consisted of three scores. In addition, the acceptance manipulation was not theoretically pure: it contained the items “I have strong *admiration* for my friend,” “I have tremendous *respect* for my friend,” and “I am *proud* of my friend” (italics added), where admiration, respect, and pride reflect status rather than acceptance.

In addition, Leary et al. (2001) evaluated the independent effects of dominance and acceptance on state self-esteem by giving participants feedback on their desirability as a

group leader or group member. The operationalizations, however, were unmatched, in two ways. First, dominance was operationalized more narrowly, as a unique social position, whereas acceptance was operationalized more broadly, as a generic social position. Second, although it is possible to be a group member without being its leader, it is not possible to be a group leader without also being a member. Hence, the manipulations were not entirely orthogonal: some participants were made group members, and others both group members *and* group leaders.

To summarize: by both building on and refining past research, we tested in Study 3 predictions derived from hierometer and sociometer theory using optimized manipulations of status and inclusion. These manipulations were: (a) theoretically-derived, operationalizing the constructs directly and unambiguously as social variables; (b) orthogonal, so that the independent effects of status and inclusion could be determined more definitively; and (c) equivalent, in virtue of matching the structure and format of the manipulations to make such effects maximally comparable.

Method

Participants. Participants were 110 first-year University of Southampton psychology undergraduates. We excluded six participants, because they guessed the study purpose. The final sample comprised 104 participants (87 female, 17 male; M_{AGE} = 19.69 years, SD_{AGE} = 4.39).

Procedure. We advertised the study under the name "Which Way Is Your Life Heading?" We presented participants with a carefully contrived cover story. In collaboration with a London-based company, the university was allegedly administering *The Bradford-French Social Value Inventory (BFSVI)*. This test assessed social value: the degree to which an individual is valued by others or society. Social value took two forms—status (respect and admiration) and inclusion (liking and acceptance). Described as a highly reliable and valid test, the BFSVI featured items that assessed participants' Intelligence Quotient (IQ) and Emotional Quotient (EQ), to diagnose accurately a test-taker's potential to achieve status and inclusion in life, relative to a national sample of young adults (cf. Twenge, Baumeister, De Wall, Ciarocco, & Bartells, 2007). The study had two alleged aims: (a) to gather further data

for the test and give participants feedback on their performance; and (b) to inform researchers about participants' experience of taking the test and receiving the feedback. Appealing to the first aim allowed us to provide manipulated feedback credibly; appealing to the second allowed us to administer the dependent measures of self-regard credibly.

Next, to bolster the cover story, the experimenter gave participants a bogus scientific journal article to read. Authored by an eminent professor and published in a major journal, it described in academic jargon the construct of social value. It elaborated on how that construct comprised both status and inclusion, and how the BFSVI measured both accurately. Participants then signed a fake declaration form. Written in bureaucratic language, and bearing a specially-designed Bradford-French logo, the form authorized release of participants' data into the Bradford-French database.

Afterwards, participants entered separate cubicles and completed the 90-item BFSVI entirely on computer. To enhance verisimilitude, we borrowed or adapted many items from other tests, which seemingly assessed a range of IQ-relevant domains (e.g., verbal knowledge, mathematical ability, logical reasoning) and EQ-relevant domains (e.g., facial expression-reading, emotional problem-solving, personality style). Items varied in difficulty to render both high and low feedback scores plausible.

Subsequently, participants read that the computer would calculate their results. A small clock appeared on the screen, and they were asked to wait for 5 seconds until computations were complete. The feedback appeared, introduced with the text, "Thank you for taking *The Bradford-French Social Value Inventory (BFSVI)*. The BFSVI calculates a person's overall long-term potential for status and inclusion, relative to a national sample of young adults." The test feedback, duly manipulated, was then presented (see "Experimental Manipulations" below). Thereafter, participants completed, also on computer, the outcome measures of self-regard and a pair of manipulation checks, masked with filler items (see "Outcome Measures" below).

Experimental Manipulations. Each participant was randomly assigned to one of four experimental conditions of a 2 (High/Low Status) × 2 (High/Low Inclusion) between-group design. Feedback order was counterbalanced. Each set of feedback consisted of a

quantitative percentile score, its diagrammatical representation, and an accompanying interpretation (Appendices A-D).

Participants in the high-status and high-inclusion conditions were informed that they had scored at the 90th percentile (on status or inclusion, respectively). Participants in the low-status and low-inclusion conditions were informed that they had scored at the 35th percentile (on status or inclusion, respectively). These scores were determined by a pilot study (N = 98 second-year psychology undergraduates), which indicated that participants expected to be above-average on both status and inclusion. Scores below the 30th percentile were not deemed credible.

Therefore, we set the quantitative percentile scores for the high-status and high-inclusion conditions at 90, and the quantitative percentile scores for the low-status and low-inclusion conditions at 35. We used two slightly different scores for each domain to avoid arousing the suspicions of participants receiving high scores, or low scores, in both domains simultaneously. Participants in the high-status conditions were informed that they had scored in the 89th percentile, and participants in the high-inclusion conditions that they had scored in the 91st percentile (90 plus-or-minus 1). Participants in the low-status conditions were informed that they had scored in the 36th percentile, and participants in the low-inclusion conditions that they had scored in the 34th percentile (35 plus-or-minus 1).

We reinforced the meaning of these quantitative percentiles by high-quality diagrams, scaled from 0-100. Each diagram illustrated participants' quantitative percentile scores relative to a national sample of other young adults (Appendices A-D).

Further, we supplemented the quantitative percentile scores with interpretations, each several paragraphs in length with the key words highlighted. We designed the contents of these paragraphs so as to operationalize faithfully the constructs of status and inclusion. For example, participants in the high-status conditions read: "[People] will respect you, value your opinions and ideas, and see you as competent and accomplished. Statistically, you are much more likely than your peers to impress others, get recognition, and stand out as important. People will tend to admire you, and think highly of your abilities and talents" (Appendix A). Likewise, participants in the high-inclusion conditions read: "[People] will

enjoy your company, feel warmly towards you, and perceive you as friendly and approachable. Statistically, you are much more likely than your peers to be liked, to feel you belong, and to come across as one of the group. People will tend to be fond of you, and add you to their social circle" (Appendix B).

In contrast, participants in the low-status conditions read: "[People] will tend not to respect you, may discount your opinions and ideas, or even see you as foolish or inept. Statistically, you are less likely than your peers to impress others, get recognition, and stand out as important. People will tend to overlook you, and question your abilities and talents" (Appendix C). Likewise, participants in the low-inclusion conditions read: "[People] will tend to avoid your company, be suspicious of you, and perceive you as unfriendly and cold. Statistically, you are less likely than your peers to be liked, to feel you belong, and to come across as one of the group. People will often take a negative view of you, and keep you at arms' length" (Appendix D).

To reinforce the above messages, and to ensure that participants did not confuse the two feedback types, the manipulation concluded with a feedback summary. For example, the high-status/low-inclusion condition featured the following summary (similar in style and format in the other conditions): "Relative to a national sample of young adults: (a) your overall potential for achieving social status is very high; (b) your overall potential for being socially included is quite low. In the domain of status, you are liable to achieve success, be respected by others, and make your mark. In the domain of inclusion, you are liable to be disliked, have problematic relationships, and find it difficult to fit in."

We carefully matched the manipulations of status and inclusion on several parameters. First: quantitatively. The high-status and high-inclusion manipulations used percentile scores around 90 (plus-or-minus 1), the low-status and low-inclusion manipulations around 35 (plus-or-minus 1). Second: psychologically. The pilot study indicated that a percentile score of 90 was psychologically equivalent to one of 35. That is, being in the top-tenth of the population was perceived to be as positive as being in the bottom-third of the population was perceived to be negative. Third: for feedback type. Both manipulations concerned participants' overall potential and made predictions about their fate.

Fourth: for content format. Both manipulations were matched textually and visually, and were similar in length, style, and phrasing. Fifth: for mode of delivery. Both were delivered over computer, with feedback order counterbalanced (Appendices A-D).

Outcome measures. Participants completed measures of state self-esteem and narcissism. Consistent with the cover story, the dependent measures were masked with filler questions (e.g., "How clear or unclear did you find the test instructions?").

Self-esteem. We used a variant of the RSES (Rosenberg, 1965) adapting all items to refer to the present. For example, we adapted the item "I certainly feel like a failure at times" to "Right now, I feel I am a failure" (1 = *completely disagree*, 7 = *completely agree*, α = .95).

Narcissism. We used a variant of the NPI-16 (Ames et al., 2006), modified similarly. For example, we adapted the item "I am more capable than other people" to "Right now, I feel like I am more capable than other people." We employed a horizontal slider with options from 1-8 (α = .86).

Manipulation checks. Participants indicated, relative to a national sample of young adults, what they believed their overall potential for status (and separately for inclusion), would be (1 = *very low*, 8 = *very high*).

Suspicion check and debriefing. Finally, participants were verbally probed for suspicion and debriefed using a funnel method. They were asked about: (a) their general experience of taking the test; (b) what feedback they had received and how they felt about it; (c) what they thought was the purpose of the test; and, finally, (d) whether they had thought the test was real. Thereafter, they were thoroughly debriefed. Participants were reassured that the test and feedback were fake and that they did not reflect on their abilities whatsoever. Finally, they were requested not to reveal the study purpose to others, thanked, and excused. No participant showed signs of distress.

Results

Manipulation checks. The manipulations were effective. High-status participants (M = 6.22, SD = 1.46) rated their potential for status higher than low-status ones (M = 3.75, SD = 1.95), $F(1, 102) = 52.92$, $p < .001$, $\eta_p^2 = .342$. Likewise, high-inclusion participants (M =

6.47, *SD* = 1.54) rated their potential for inclusion higher than low-inclusion ones (*M* = 3.92, *SD* = 2.08), $F(1, 102) = 50.87$, $p < .001$, $\eta_p^2 = .333$. Neither manipulation affected the opposite domain. High-status (*M* = 5.04, *SD* = 2.14) and low-status (*M* = 5.38, *SD* = 2.30) participants did not differ on potential for inclusion, $F(1, 102) = 0.61$, $p = .437$, $\eta_p^2 = .006$, and high-inclusion (*M* = 4.91, *SD* = 2.07) and low-inclusion (*M* = 4.92, *SD* = 2.21) participants did not differ on potential for status, $F(1, 102) = .001$, $p = .970$, $\eta_p^2 = .000$.

Self-esteem. A 2 (status: high, low) × 2 (inclusion: high, low) × 2 (order) Analysis of Variance (ANOVA) showed main effects for both status, $F(1, 96) = 10.35$, $p = .002$, $\eta_p^2 = .097$, and inclusion, $F(1, 96) = 4.11$, $p = .045$, $\eta_p^2 = .041$. High-status participants (*M* = 5.35, *SD* = 1.14) had higher self-esteem than low-status ones (*M* = 4.54, *SD* = 1.44), and high-inclusion participants (*M* = 5.22, *SD* = 1.14) had higher self-esteem than low-inclusion ones (*M* = 4.61 *SD* = 1.38). There was no interaction, $F(1, 96) = .08$, $p = .783$, $\eta_p^2 = .001$.

There was no main effect of order. A significant Inclusion × Order interaction emerged, $F(1, 96) = 5.06$, $p = .027$, $\eta_p^2 = .050$. The inclusion feedback had a greater impact when presented first than second. No other effect attained significance.

Narcissism. A similar 2 × 2 × 2 ANOVA showed that status affected state narcissism, $F(1, 96) = 4.59$, $p = .035$, $\eta_p^2 = .046$. High-status participants (*M* = 4.01, *SD* = 1.01) were more narcissistic than low-status ones (*M* = 3.61, *SD* = 0.96). In contrast, inclusion did not affect narcissism, $F(1, 96) = 0.99$, $p = .332$, $\eta_p^2 = .010$. High-inclusion participants (*M* = 3.91, *SD* = 0.89) were no more narcissistic than low-inclusion ones (*M* = 3.67, *SD* = 1.10). There was no interaction, $F(1, 96) = 1.65$, $p = .202$, $\eta_p^2 = .017$. No other effect attained significance.

Discussion

Study 3 provided the first simultaneous experimental test of predictions derived from hierometer and sociometer theory. Critically, the orthogonal experimental design permitted causal inferences to be drawn. The pattern of results obtained mirrored that of Study 1. In particular, manipulating status to be higher or lower led to correspondingly higher or lower levels of state self-esteem and state narcissism. Manipulating inclusion to be higher or lower led to correspondingly higher or lower levels of state self-esteem only. Thus, at the level of transient conditions and momentary states, the findings were consistent with self-esteem

serving both a hierometric and a sociometric function (i.e., independently tracking both status and inclusion in a positive direction), but with narcissism serving a hierometric function only (i.e., independently tracking status alone in a positive direction).

Study 4

Study 4 provided an additional experimental test of predictions from hierometer and sociometer theory. We examined whether, and to what extent, the Study 3 findings would replicate with an additional sample, employing alternative measures of state self-esteem and narcissism. We again orthogonally manipulated status and inclusion, and assessed their independent impact on state self-esteem and narcissism.

Method

Participants. Participants were 283 University of Southampton students. We excluded 20 participants, because they guessed the study purpose, and four, because they encountered technical issues during the procedure. The final sample comprised 259 participants (199 female, 60 male; M_{AGE} = 19.50 years, SD_{AGE} = 2.74).

Procedure. Participants received the same cover story regarding the BFSVI. After reading the bogus scientific journal article and signing the declaration form, they entered separate cubicles and completed the BFSVI on computer, followed by the randomly-determined feedback. Next, they completed the dependent measures and manipulation checks, masked with filler items. Suspicion check and debriefing followed.

Outcome Measures. We assessed state self-esteem with the item "(Right now), how do you feel about yourself overall?" (1 = *very bad*, 8 = *very good*). We assessed state narcissism with the item "(Right now), how do you feel about yourself overall?" (1 = *humble*, 8 = *narcissistic*). These bespoke outcome measures: (a) enabled an alternative test of hypotheses; (b) were high in face validity; (c) assessed both self-esteem and narcissism as unified constructs and on 8-point rating scales; (d) were liable, due to their brevity, to sensitively capture the effect of the manipulations; and (e) correlated moderately-to-strongly

with established measures of self-esteem and narcissism.[5]

Results

Manipulation checks. The manipulations were effective. High-status participants (M = 6.40, SD = 1.17) rated their potential for status higher than low-status ones (M = 4.56, SD = 1.85), $F(1, 257) = 89.37$, $p < .001$, $\eta_p^2 = .258$. Likewise, high-inclusion participants (M = 6.57, SD = 1.21) rated their potential for inclusion higher than low-inclusion ones (M = 4.73, SD = 1.75), $F(1, 257) = 96.96$, $p < .001$, $\eta_p^2 = .274$. Neither manipulation significantly affected the opposite domain. Low-status (M = 5.84, SD = 1.64) and high-status (M = 5.45, SD = 1.88) participants did not differ on potential for inclusion, $F(1, 257) = 3.12$, $p = .079$, $\eta_p^2 = .012$. Likewise, low-inclusion (M = 5.64, SD = 1.60) and high-inclusion (M = 5.23, SD = 1.99) participants did not differ on potential for status, $F(1, 257) = 3.39$, $p = .067$, $\eta_p^2 = .013$.

Self-esteem. A 2 (status: high, low) × 2 (inclusion: high, low) × 2 (order) ANOVA showed that both status and inclusion affected self-esteem, $F(1, 251) = 86.87$, $p < .001$, $\eta_p^2 = .257$, and $F(1, 251) = 39.74$, $p < .001$, $\eta_p^2 = .137$, respectively. High-status participants (M = 5.87, SD = 1.59) had higher self-esteem than low-status ones (M = 4.16, SD = 1.69), as did high-inclusion participants (M = 5.52, SD = 1.86) relative to low-inclusion ones (M = 4.43, SD = 1.68).

A Status × Inclusion interaction also emerged, $F(1, 251) = 16.04$, $p < .001$, $\eta_p^2 = .060$. High-status/high-inclusion participants had the highest self-esteem (M = 6.87, SD = 0.97), followed by high-status/low-inclusion participants (M = 4.94, SD = 1.50), $t(1, 255) = 7.15$, $p < .001$, followed by low-status/high-inclusion participants (M = 4.37, SD = 1.66), $t(1, 255) = 2.18$, $p = .030$, and finally, low-status/low-inclusion ones (M = 3.94, SD = 1.71), $t(1, 255) = 1.67$, $p = .095$. No other effect was significant.

Narcissism. A similar 2 × 2 × 2 ANOVA showed that status affected narcissism, $F(1,$

[5] Pilot data indicated that the state self-esteem measure correlated positively with the RSES (Rosenberg, 1965), $r(219) = .83$, $p < .001$, and the SISE (Robins et al., 2001), $r(119) = .67$, $p < .001$, and that the state narcissism measure correlated positively with the NPI-16 (Ames et al., 2006), $r(219) = .36$, $p < .001$, and the SINS (Konrath, Meier, & Bushman, 2014), $r(120) = .54$, $p < .001$.

251) = 5.79, p = .017, η_p^2 = .023. High-status participants (M = 4.19, SD = 1.50) were more narcissistic than low-status ones (M = 3.79, SD = 1.28). Inclusion also affected narcissism, F(1, 251) = 8.71, p = .003, η_p^2 = .034: High-inclusion participants (M = 3.73, SD = 1.45) were *less* narcissistic than low-inclusion ones (M = 4.22, SD = 1.31). A significant order effect emerged, F(1, 251) = 4.55, p = .034, η_p^2 = .012. Narcissism was higher when the status feedback was presented second (M = 4.16, SD = 1.43) than first (M = 3.79, SD = 1.34). No other effect was significant.

Discussion

Study 4 again tested experimentally predictions from hierometer and sociometer theory, using brief state measures of self-esteem and narcissism. As in Study 3, manipulating status to be higher or lower led to correspondingly higher or lower levels of both state self-esteem and state narcissism. Manipulating inclusion to be higher or lower led to correspondingly higher or lower state self-esteem only. Manipulating inclusion to be higher or lower led to lower or higher state narcissism, respectively. Although not inconsistent with our predictions, this finding differed slightly from the pattern in Study 3, where inclusion was unrelated to narcissism; however, it converged with the correlational results from Study 2. We address the matter below in the General Discussion. In all, once again, higher status and higher inclusion each promoted higher self-esteem, whereas only higher status promoted higher narcissism.

General Discussion

We aimed to illuminate the function of self-regard by testing predictions derived from two theories. Hierometer theory proposes that self-regard tracks social status—rising when high and falling when low—to regulate status-optimizing behavior. Sociometer theory proposes that self-esteem tracks social inclusion—rising when high and falling when low—to regulate inclusion-optimizing behavior. We considered two types of self-regard—self-esteem and narcissism—and posited that they serve somewhat different functions. We hypothesized that self-esteem would operate as both a hierometer and a sociometer, tracking both status and inclusion in a positive direction, whereas narcissism would operate as a hierometer, tracking status in a positive direction.

Summary of Findings

We tested predictions derived from hierometer and sociometer theory (Table 1) in four studies, which featured complementary cross-sectional and experimental designs.

Study 1 tested our hypotheses correlationally at the level of enduring conditions and dispositional traits. It did so using well-established measures of self-regard, the RSES and NPI-16. It also examined whether and to what extent these links are moderated by key demographic and dispositional characteristics. As hypothesized, trait self-esteem tracked both status and inclusion in a positive direction, whereas trait narcissism tracked only status in this way. These results persisted after controlling for gender, age, and personality—with only minor exceptions. The largest moderational effect involved agreeableness slightly amplifying the link between inclusion and self-esteem. Thus, the links specified by sociometer and hierometer theory held up well across people of varying demographics and dispositions, increasing confidence in their generality and robustness.

Study 2 re-tested our hypotheses correlationally at the level of traits. It did so with recently developed alternative measures of self-regard, the LSES and the NARQ. In addition, this study was pre-registered with the Open Science Framework. Again, the results were consistent with our hypotheses. Status and inclusion each predicted positively trait self-esteem, independently of one another. By contrast status, but not inclusion, positively and independently predicted trait narcissism; inclusion predicted narcissism negatively.

Studies 1-2, being cross-sectional, could not establish causal relationships between the key constructs. Accordingly, Studies 3-4 adopted an experimental approach. Study 3 provided the first experimental test of hierometer theory, alongside a parallel test of sociometer theory. Using theoretically-derived manipulations of status and inclusion, which operationalized both constructs orthogonally and equivalently, it assessed their independent causal impact on self-esteem and narcissism for the first time. Here, manipulating status to be higher or lower led to correspondingly higher or lower levels of both state self-esteem and state narcissism. However, manipulating inclusion to be higher or lower led only to correspondingly higher or lower levels of state self-esteem. State narcissism was unaffected.

This pattern of experimental results thus recalled the pattern of correlational results obtained in Study 1.

Finally, Study 4 again experimentally manipulated status and inclusion orthogonally, and assessed their independent impact on state self-esteem and narcissism, but this time with a larger sample, and using alternative measures of state self-esteem and narcissism. Once more, manipulating status to be higher or lower led to a corresponding rise and fall in both state self-esteem and state narcissism. Once more, manipulating inclusion to be higher or lower led to a corresponding rise and fall in state self-esteem, and it led to a corresponding fall and rise in state narcissism. This pattern of experimental results thus recalled the pattern of correlational results obtained in Study 2.

Thus, across all studies, higher status consistently predicted and promoted both self-esteem and narcissism, whereas higher inclusion consistently predicted and promoted self-esteem only. Self-esteem always tracked status and inclusion in a positive direction—in keeping with its operating as both a hierometer and a sociometer. By contrast, narcissism always tracked only status in a positive direction—in keeping with its operating as a hierometer. Our theoretical predictions were confirmed.

Implications

The function of self-esteem. The findings refine understanding of the function of self-esteem. They demonstrate that self-esteem operates not only as a sociometer, but also—and to no lesser extent—as a hierometer. That is, self-esteem is a type of self-regard that tracks *both* status *and* inclusion in a positive direction. Otherwise put, status and inclusion each act as independent sources of self-esteem: Being afforded greater respect and admiration, or greater liking and acceptance, predicts and promotes higher self-esteem. These findings underscore how the "social inclusion" of which the original version of sociometer theory speaks (Leary et al., 1995), is not the whole story, and how the "relational value" of which the revised version of sociometer theory speaks (Leary, 2005), is not monolithic. Moreover, these findings generalized across individuals of different demographics and personality dispositions. Higher status and higher inclusion each predicted higher self-esteem across genders, age groups, and personality types.

Both hierometer theory and sociometer theory focus on global self-esteem. Alternatively, some researchers have offered a domain-specific functional perspective on self-esteem, with each domain posited to serve a specific function (Kirkpatrick & Ellis, 2001). Nonetheless, the self remains a unitary entity and there is merit in examining self-esteem as a whole. Moreover, measuring self-esteem globally provides a suitable conceptual correspondence to the fundamental needs for status and belonging. These motives are theorized to be fundamental—powerful and pervasive (Anderson et al., 2015; Baumeister & Leary, 1995). Thus, it seems plausible that these fundamental motives would affect global self-esteem.

The function of narcissism. These findings also add to the literature on the function of narcissism (Holtzman & Strube, 2011). In terms of sociometer theory, narcissism has been likened to a malfunctioning psychological gauge (Leary & Downs, 1995; Leary & Guadagno, 2011). In particular, narcissists have been theorized to possess miscalibrated sociometers, whose needles are stuck at a permanently high level. Our findings, however, suggest that, rather than being a malfunctioning gauge, narcissism is instead a different type of gauge, attuned to a different type of input: a hierometer preferentially attuned to status. In all our studies, higher status consistently predicted and promoted narcissism. In contrast, higher inclusion did not predict or promote narcissism.

Nonetheless, we observed some variation in how inclusion related to narcissism. In Studies 1 and 3, inclusion was unrelated to narcissism. However, in Studies 2 and 4, it was inversely related to it. This inconsistency is not at odds with our hypotheses. Nonetheless, how should it be interpreted? And what might its implications be, if any, for hierometer and sociometer theory? It is worth noting here that similar inconsistencies have emerged before. For instance, Mahadevan et al. (2016) previously found in one study that inclusion and narcissism did not covary, but in another that they covaried negatively. Furthermore, related research finds that communion-related constructs are sometimes unrelated to, and sometimes inversely predictive of, narcissism (Campbell, Bosson, Goheen, Lakey, & Kernis, 2007; Paulhus & Williams, 2002).

Conservatively, we might state that, because both patterns emerged equally often in the present research, no consistent pattern emerged overall. If so, then perhaps the safest conclusion to draw for now is that inclusion does not positively predict narcissism. That said, the divergence might also conceivably be a product of the different ways in which we operationalized narcissism. In Studies 1 and 3, we measured it with the NPI-16. In Studies 2 and 4, we measured it, respectively, with the NARQ and a single-item measure. We speculate that these indices differed in the extent to which their items tapped the "healthier" and "unhealthier" aspects of narcissism (Ackerman et al., 2011; Roche, Pincus, Lukowitsky, Ménard, Conroy, 2013; Sedikides, Rudich, Gregg, Kumashiro, & Rusbult, 2004). Specifically, the NPI-16 might have preponderantly captured the former, which are irrelevant to inclusion; in contrast, the NARQ and the single-item measure might have preponderantly captured the latter, which are at odds with inclusion (Back et al., 2013; Cain et al., 2008, but see Miller, Lynam, & Campbell, 2014). In favor of this interpretation is the fact that the known "unhealthy" items on the NPI-16 are in the minority. In particular, only three ("I find it easy to manipulate people," "I insist upon getting the respect that is due me," and "I expect a great deal from other people;" Ames et al., 2006, p. 10) are among those clearly loading on the toxic *entitlement-exploitativeness* factor (Ackerman et al., 2011, p. 69). In contrast, exactly half the items on the NARQ assess narcissistic rivalry, an arguably unhealthy facet. Additionally, the single-item measure used in Study 4 explicitly featured the word *narcissistic* as one of its bipolar adjectives. This might reasonably put the single-item measure more on par with the NARQ than the NPI-16. Future empirical research—whose concerns are more domain-specific than global—may address the matter more definitively.

In all, narcissism definitely did not operate as self-esteem did in respect of social inclusion. This is a noteworthy finding: depending on the self-regard in question, *greater inclusion does not always mean higher self-regard*. Contrary to the sociometer hypothesis, being liked and accepted may not always promote feeling better about oneself. Indeed, when it comes to narcissistic self-regard, social inclusion may be irrelevant, or even antithetical to it. As long as one receives respect and admiration, this type of self-regard may not "care" about levels of social inclusion. Such a finding is one, moreover, that a simplistic or

monolithic "looking-glass self" view of self-concept content struggles to accommodate (Wallace & Tice, 2012; Cooley, 1902). A more dynamic and/or compensatory model is necessary to account for it (Back et al., 2013; Morf, Horvath, & Torchetti, 2011; Sedikides & Campbell, 2017).

Our alternative and constructive characterization of narcissism as a hierometer that tracks status is consistent with prior work indicating that narcissism involves a greater concern for agency over communion (cf. the *extended agency model*; Campbell & Foster, 2007). For instance, narcissists prefer admiring, high-status romantic partners to warm, caring ones, and self-enhance on agentic traits but not on communal ones (Campbell, 1999; Campbell et al., 2002; Krizan & Bushman, 2011). Likewise, they desire power and leadership, but are low in empathy and need for intimacy (Campbell & Campbell, 2009; Vonk, Zeigler-Hill, Mayhew, & Mercer, 2013). This characterization of narcissism is important: It suggests that narcissism may be functional after all. In particular, narcissism might be uniquely fitted for regulating the pursuit of status in situations where inclusion is irrelevant or an obstacle. Narcissism might be a key gear in a psychological system that regulates assertive entry into competitive contests when prevailing social conditions are relatively antagonistic (e.g., in societies or situations that are dominance-based rather than prestige-based; De Waal-Andrews, Gregg, & Lammers, 2015; Henrich & Gil-White, 2001).

Other implications. Our research also brings conceptual clarity to cognate literatures within and outside psychology, and suggests fruitful avenues for future research. As a case in point, it illuminates the study of children's peer relationships and popularity—a topic of interest to several disciplines, including developmental psychology, sociology, and ethology. Specifically, our research distinguished between two potential functions that self-regard might serve—a status-tracking hierometric function and an inclusion-tracking sociometric function. We examined two types of self-regard—self-esteem and narcissism, positing that self-esteem would track status and inclusion positively, whereas narcissism would only track status positively. This differentiation of status, which entails social respect and admiration, from inclusion, which entails social liking and acceptance, illuminates the study of children's peer relationships and popularity across disciplines. In developmental psychology, popular

children are described as being prosocial, likeable, and helpful (Coie, Dodge, & Coppotelli, 1982), whereas, in sociology and ethology, popular children are described as being "cool," able to compete successfully, and commanding attention from their peers (Hawley, 1999). This divergence can now be readily understood. Whereas the developmental definition of popularity focuses on inclusion (i.e., being liked and accepted), the sociological and ethological definitions focus on status (i.e., being respected and admired). On the basis of this conceptual clarification, future researchers might proceed to investigate the self-regard of children who were classified as popular primarily by one definition or the other. We would expect that children whose peer popularity entails higher status or higher inclusion to be higher in self-esteem, but only the former to be higher in narcissism.

Likewise, our research resonates with recent advances on the developmental origins of high self-esteem and narcissism. Brummelman and colleagues (2015) found that, whereas parental overvaluation was linked to higher narcissism in children, parental warmth was linked to higher self-esteem. Parental overvaluation and parental warmth are not identical to status and inclusion, respectively, but they are conceptually similar. Thus, giving children a sense that they are high in status, by lavishing them admiration, might foster narcissism, whereas giving them a sense that they are highly included, by communicating acceptance, might not.

Finally, our research adds to recent advances on state narcissism and on potential interventions to reduce it. Narcissism has typically been regarded a dispositional variable, but can also be conceptualized as a state (Giacomin & Jordan, 2016; Horton et al., 2014). Our findings indicate that, like self-esteem, narcissism can be malleable and sensitive to context. Although higher status led to higher state narcissism, higher inclusion did not. In contrast, higher status and higher inclusion each led to higher state self-esteem. This has implications for educational policy. Some decades ago, the "self-esteem movement" rose to prominence (Baumeister et al., 2003), prompting wide-scale interventions to raise self-esteem in society (Mecca, Smelser, & Vasconcellos, 1989). However, more recently, scholars have voiced concerns about rising levels of narcissism in Western youth (Twenge et al., 2008). Given that high self-esteem is generally associated with fewer undesirable outcomes than narcissism is,

one might conservatively prefer to raise self-esteem without also raising narcissism. Our findings suggest a potential way to do this: by emphasizing social inclusion rather than social status. The findings thereby add to recent work attempting to untangle the bases of self-regard with a view to developing maximally effective interventions (e.g., competence and worthiness training; Mruk & O'Brien, 2013).

Limitations and Future Directions

This research utilized large, diverse samples comprising university students as well as online participants from several countries. Nonetheless, the majority of our participants resided in Western countries. Accordingly, we could not assess the potential role of cultural differences. Also, this research featured a combination of cross-sectional and experimental methods, to establish external and internal validity. Future research could additionally employ longitudinal methods (e.g., with observational or ambulatory data in a diary or experience sampling study) to examine how status and inclusion longitudinally predict self-esteem and narcissism. Such a practice would enhance the ecological validity of these findings and place them in a real-life context. In addition, this research focused on social status in the form of social respect and admiration, which is the central construct of interest to hierometer theory, and theorized to be a fundamental motive (Anderson et al., 2015; Bakan, 1966). However, other types of hierarchy also exist—such as power, socioeconomic class, and organizational rank (Magee & Galinsky, 2008). It would be interesting to see how these other types of hierarchy relate to self-regard, and whether for instance, they differentially affect self-esteem and narcissism. Finally, this research focused on ‘normal’ narcissism, which like self-esteem, exists on a continuum, and was hypothesized to serve a hierometric function. It did not examine other types of narcissism, such as pathological narcissism or Narcissistic Personality Disorder (cf. Campbell & Miller, 2011). It would be interesting to see whether similar findings also emerge here. On the one hand, pathological narcissism is, almost by definition, maladaptive, and therefore might not serve any function, let alone a status-tracking one. On the other hand, some scholars have posited that pathological narcissism, like normal narcissism, is organized around a common core desire for recognition and admiration—a construct that closely resembles social status (Roche et al., 2013). If this is

the case, pathological narcissism might also operate as a hierometer, positively tracking status. Follow-up research could address the links among status, inclusion, self-esteem, and pathological narcissism to find out if pathological narcissism operates similarly to or differently from normal narcissism regarding status and inclusion.

Conclusions

This investigation aimed to illuminate the function of self-regard. It tested predictions from two theories, sociometer theory and hierometer theory, using both correlational and experimental methods, at the level of traits and states, and with comprehensive, theoretically-derived, and well-matched measures and manipulations. Our findings suggest that self-esteem operates as both hierometer and sociometer, tracking both status and inclusion in a positive direction, whereas narcissism operates chiefly as a hierometer tracking status in a positive direction. The links are causal and persist independently of key demographic and personality characteristics. In other words, both feeling liked and accepted, and respected and admired, will help one to conclude that one is a person of worth; but only being respected and admired will help one to conclude that his or her worth exceeds that of others. Thus, the link between other people's regard for oneself, and one's own regard for oneself, is complex. This complexity needs to be appreciated in attempting to understand the functions that self-regard might serve.

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Table 1. Schematic Overview of Predictions

		Predictors/IVs		*Criterions/DVs*	
		Status	Inclusion	Narcissism	Self-Esteem
Predictors/IVs	Status	-	$r_{S\,I} > 0$	$B_{S\,N\,\cdot\,I} > 0$ ($r_{S\,N\,\cdot\,I} > 0$)	$B_{S\,SE\,\cdot\,I} > 0$ ($r_{S\,SE\,\cdot\,I} > 0$)
	Inclusion		-	$B_{I\,N\,\cdot\,S} \leq 0$ ($r_{I\,N\,\cdot\,S} \leq 0$)	$B_{I\,SE\,\cdot\,S} > 0$ ($r_{I\,SE\,\cdot\,S} > 0$)
Criterions/DVs	Narcissism			-	*No prediction*
	Self-Esteem				-

Note: $_{S}$ = status, $_{I}$ = inclusion, $_{SE}$ = self-esteem, $_{N}$ = narcissism; $r_{X\,Y}$ = zero order correlation between *X* and *Y*, $B_{X\,Y}$ = regression coefficient X predicting Y, $r_{X\,Y\,\cdot\,Z}$ = partial correlation between *X* and *Y* controlling for *Z*, $B_{X\,Y\,\cdot\,Z}$ = partial regression coefficient *X* predicting *Y*, controlling for *Z*.

Table 2. *Study 1: Factor loadings of status and inclusion items from exploratory factor analysis*

	Factor		
Items	1	2	3
1. …respect my achievements.	.091	**.437**	.143
2. ...value my opinions and ideas.	.141	**.374**	.148
3. …approve of how I live my life.	-.118	.134	**.793**
4. ...think well of how I conduct myself.	.066	.016	**.583**
5. …think highly of my abilities and talents.	.202	**.367**	.061
6. ...admire me.	.108	**.624**	.078
7. ...consider me a success.	-.026	**.616**	.255
8. …look up to me.	.099	**.705**	.031
9. ...see me as an important person.	.055	**.802**	-.047
10. ...consider me a high-status individual.	-.078	**.782**	.027
1. ...like me as a person.	**.759**	-.047	.061
2. ...feel warmly towards me.	**.737**	.012	.053
3. …consider me to be a nice person to have around.	**.714**	-.060	.045
4. …do not like me.	**-.663**	.167	-.038
5. …include me in their social activities.	**.599**	.243	-.039
6. …are happy for me to belong to their social groups.	**.706**	.204	-.076
7. …accept me.	**.673**	.058	.109
8. …see me as fitting in.	**.609**	.157	.127
9. …approve of my behavior.	.294	-.091	**.646**
10. …would be willing to be friends with me.	**.679**	.070	.074

Note. $N = 940$.

Numbers in bold represent the highest factor loadings for each item above a criterion of $r = 0.30$. The inclusion items loaded on Factor 1, the status items on Factor 2, and the approval items on Factor 3.

Table 3. *Study 1: Means, Standard Deviations, Reliabilities, and Bivariate Correlations of Main Variables*

	Study 1					
Variable	*M*	*SD*	*α*	*1*	*2*	*3*
1. Status	3.32	.71	.87	1	-	-
2. Inclusion	3.69	.64	.90	.57***	1	-
3. Self-esteem	3.54	.71	.82	.50***	.50***	1
4. Narcissism	3.16	.77	.86	.37***	.21***	.29***

*$p < .05$; **$p < .01$; ***$p < .001$.

Table 4. *Study 1: Regression of age, gender, and personality on self-esteem*

	Model 1		Model 2		Model 3	
Variable	β	*p*	β	*p*	β	*p*
1. Status	**.312**	**.000**	**.228**	**.000**	**.222**	**.000**
2. Inclusion	**.327**	**.000**	**.156**	**.000**	**.171**	**.000**
3. Age	-	-	.137	.000	.126	.000
4. Gender	-	-	-.025	.301	-.020	.419
5. Extraversion	-	-	.161	.000	.153	.000
6. Stability	-	-	.327	.000	.307	.000
7. Agreeableness	-	-	.015	.574	.035	.195
8. Conscientiousness	-	-	.126	.000	.133	.000
9. Openness	-	-	.072	.003	.050	.037
10. Status*Age	-	-	-	-	.045	.117
11. Status*Gender	-	-	-	-	-.057	.058
12. Inclusion*Age	-	-	-	-	-.057	.046
13. Inclusion*Gender	-	-	-	-	.012	.686
14. Status*Extraversion	-	-	-	-	-.101	.001
15. Status*Stability	-	-	-	-	-.024	.480
16. Status*Agreeableness	-	-	-	-	-.041	.184
17. Status*Conscientiousness	-	-	-	-	.008	.804
18. Status*Openness	-	-	-	-	.053	.088
19. Inclusion*Extraversion	-	-	-	-	.031	.317
20. Inclusion*Stability	-	-	-	-	-.010	.779
21. Inclusion*Agreeableness	-	-	-	-	.133	.000
22. Inclusion*Conscientiousness	-	-	-	-	-.003	.929
23. Inclusion*Openness	-	-	-	-	-.075	.017

Table 5. *Study 1: Regression of age, gender, and personality on narcissism*

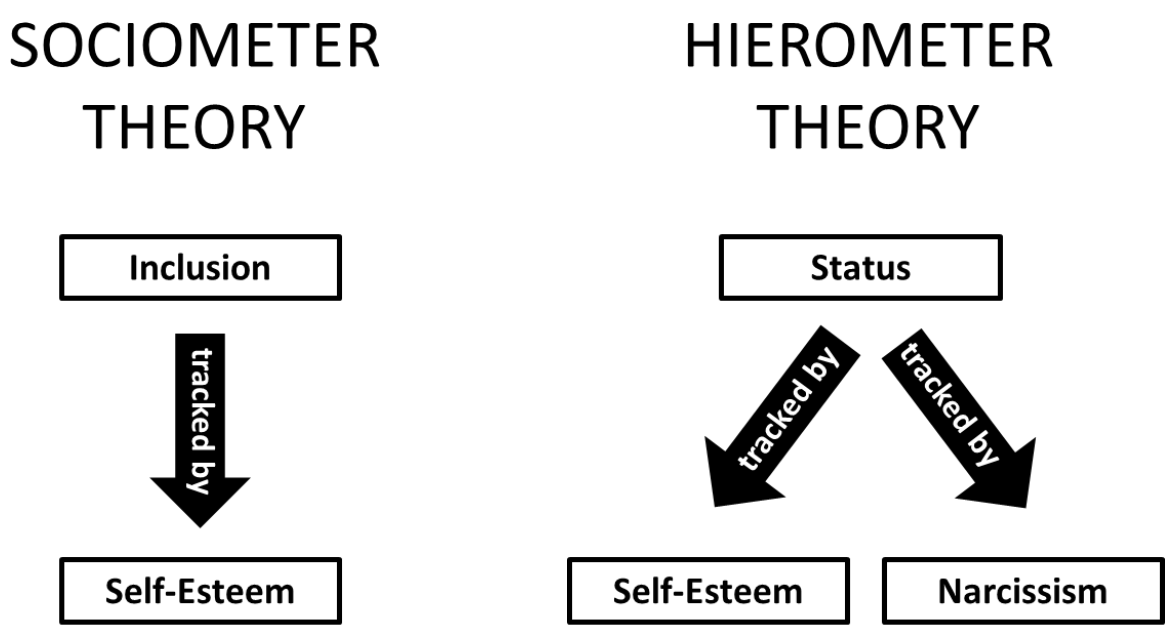
	Model 1		Model 2		Model 3	
Variable	β	*p*	β	*p*	β	*p*
1. Status	**.356**	**.000**	**.259**	**.000**	**.259**	**.000**
2. Inclusion	**.010**	**.783**	**-.004**	**.909**	**-.012**	**.751**
3. Age	-	-	-.065	.025	-.063	.030
4. Gender	-	-	.107	.000	.109	.000
5. Extraversion	-	-	.279	.000	.292	.000
6. Stability	-	-	.118	.000	.121	.000
7. Agreeableness	-	-	-.246	.000	-.241	.000
8. Conscientiousness	-	-	-.035	.245	-.043	.163
9. Openness	-	-	.110	.000	.117	.000
10. Status*Age	-	-	-	-	-.019	.576
11. Status*Gender	-	-	-	-	-.121	.001
12. Inclusion*Age	-	-	-	-	-.041	.236
13. Inclusion*Gender	-	-	-	-	.085	.018
14. Status*Extraversion	-	-	-	-	.008	.833
15. Status*Stability	-	-	-	-	.069	.087
16. Status*Agreeableness	-	-	-	-	-.003	.941
17. Status*Conscientiousness	-	-	-	-	-.027	.490
18. Status*Openness	-	-	-	-	.048	.198
19. Inclusion*Extraversion	-	-	-	-	-.023	.547
20. Inclusion*Stability	-	-	-	-	.013	.756
21. Inclusion*Agreeableness	-	-	-	-	-.023	.557
22. Inclusion*Conscientiousness	-	-	-	-	-.041	.306
23. Inclusion*Openness	-	-	-	-	-.032	.404

Table 6. *Study 2: Means, Standard Deviations, Reliabilities, and Bivariate Correlations of Main Variables*

	Study 2						
Variable	*M*	*SD*	*α*	*1*	*2*	*3*	*4*
1. Status	3.30	.78	.92	1	-	-	-
2. Inclusion	3.81	.64	.92	.66***	1	-	-
3. Self-esteem	3.65	.90	.95	.67***	.63***	1	-
4. Narcissism	2.73	.82	.89	.36***	.09*	.20***	1

*$p < .05$; **$p < .01$; ***$p < .001$.

Figure 1. A side-by-side illustration of the hypothesized dynamics of (the original version of) sociometer theory and hierometer theory.



Appendix A. High Status Manipulation

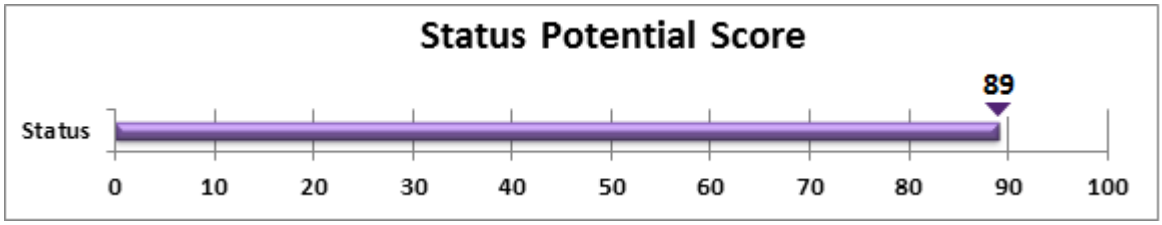
The BFSVI measures *overall potential for status*. This extends to **all social situations**, both **professional and non-professional**.

Here, you scored **significantly above average**—in the **89th percentile**—on status-relevant traits and behaviors, compared to a national sample of young adults. This means that your *long-term potential for status* is **very high**—among the **top 11%** of the population.

People who score in this range typically find it *easy* to accomplish their occupational and financial goals, and commonly become *very successful*, especially later in life. Long-term, you will probably have one or more *prestigious, fulfilling careers*, and you have a significantly higher than average chance of becoming *wealthy*: scorers in this range usually end up in the *top income earners* in the population, and will achieve *complete economic security*.

Even if you have not done well in your life so far, as time passes this will change, and you are liable to become more and more successful. Your test results show that you are *more intellectually versatile* than most of your peers, and given the right opportunity, can be a leader. You will likely be effective and efficient at achieving your goals.

Across your life as a whole, you will also enjoy a high social standing. Prospective friends, romantic partners, colleagues, bosses, and even casual acquaintances will *respect you*, *value your opinions and ideas*, and see you as *competent and accomplished*. Statistically, you are much *more likely* than your peers to *impress others*, get recognition, and stand out as important. People will tend to *admire you*, and think highly of your abilities and talents.



Appendix B. High Inclusion Manipulation

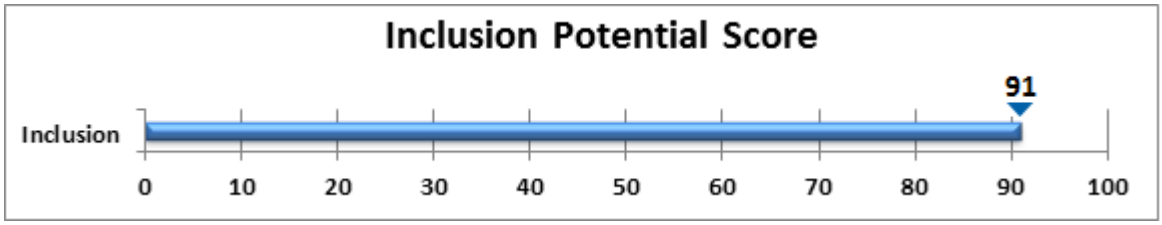
The BFSVI measures *overall potential for inclusion*. This extends to **all social situations,** both **professional and non-professional**.

Here, you scored **significantly above average**—in the **91st percentile**—on inclusion-relevant traits and behaviors, compared to a national sample of young adults. This means that your *long-term potential for inclusion* is **very high**—among the **top 9%** of the population.

People who score in this range typically find it *easy* to form and maintain relationships, and are commonly in *close contact* with many people, especially later in life. Long-term, you will probably go on to have *many close and fulfilling relationships*, and you have a significantly higher than average chance of *fitting in socially*: scorers in this range are several times more likely to end up *belonging to social groups* than the rest of the population.

Even if you have not had many good relationships in your life so far, as time passes this will change, and you will find yourself becoming more and more included in social life. Your test results show that you are *more sympathetic* than most of your peers, and liable to be accepted. You will likely be able to relate well to other people, and to be good at understanding them.

Across your life as a whole, you will fit well into almost every group you join. Prospective friends, romantic partners, colleagues, bosses, and even casual acquaintances will *enjoy your company*, *feel warmly* towards you, and perceive you as *friendly and approachable*. Statistically, you are much *more likely* than your peers to be *liked*, to feel you belong, and to come across as one of the group. People will tend to be *fond of you*, and add you to their social circle.



Appendix C. Low Status Manipulation

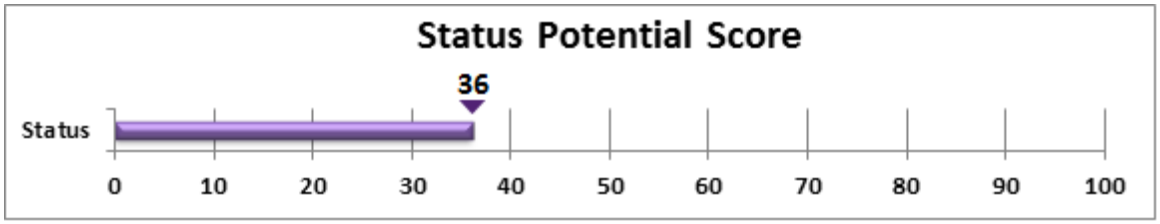
The BFSVI measures *overall potential for status*. This extends to **all social situations**, both **professional and non-professional**.

Here, you scored **significantly below average**—in the **36th percentile**—on status-relevant traits and behaviors, compared to a national sample of young adults. This means that your *long-term potential for status* is **quite low**—among the **bottom 36%** of the population.

People who score in this range typically find it a *challenge* to accomplish their occupational and financial goals, and commonly encounter *failure*, especially later in life. Long-term, you will probably *struggle to build a prestigious, fulfilling career*, and you have a significantly higher than average chance of facing *financial difficulties*: scorers in this range often end up among the bottom income earners in the population, and the majority will require social assistance (e.g., from the government) at some point.

Even if you have done well in your life so far, as time passes this will change, and you are liable to find it harder and harder to succeed. Your test results show that you are less intellectually gifted than most of your peers, and show little leadership potential. Trying to achieve your goals may cause you significant frustration.

Across your life as a whole, you will also tend to have a low social standing. Prospective friends, romantic partners, colleagues, bosses, and even casual acquaintances will *tend not to respect you*, may *discount* your opinions and ideas, or even see you as *foolish or inept*. Statistically, you are *less likely* than your peers to impress others, get recognition, and stand out as important. People will tend to overlook you, and question your abilities and talents.



Appendix D. Low Inclusion Manipulation

The BFSVI measures *overall potential for inclusion*. This extends to **all social situations,** both **professional and non-professional**.

Here, you scored **significantly below average**—in the **34th percentile**—on inclusion-relevant traits and behaviors, compared to a national sample of young adults. This means that your *long-term potential for inclusion* is **quite low**—among the **bottom 34%** of the population.

People who score in this range typically find it a *challenge* to form and maintain relationships, and commonly find themselves *isolated*, especially later in life. Long-term, you will very probably *struggle to build many close or fulfilling relationships*, and you have a significantly higher than average chance of being *socially impaired*: scorers in this range are several times more likely to end up excluded from social groups than the rest of the population.

Even if you have had good relationships in your life so far, as time passes this will change, and you will find yourself becoming more and more excluded from social life. Your test results show that you are less sympathetic than most of your peers, and in danger of rejection. You will likely have difficulty relating to other people, and be poor at understanding them.

Across your life as a whole, you will tend to be an outsider even in the groups you join. Prospective friends, romantic partners, colleagues, bosses, and even casual acquaintances will tend to *avoid your company*, be *suspicious* of you, and perceive you as *unfriendly and cold*. Statistically, you are *less likely* than your peers to be liked, to feel you belong, and to come across as one of the group. People will often take a negative view of you, and keep you at arms' length.